الجامعة البريطانية في مصر

كلية الهندسة

اللائحـــة الأكاديميـــة لمرحلـــة البكالوريوس

أبريـــل 2017

3/10/2018

موافقـة مجلس الكليـة بجلسته (5) بتاريخ 2017/4/19

مـــادة (1): الرؤية والرسالة والأهداف

الرؤيـــة:

تسعى كليـة الهندسـة حثيثـا لأن تكون في مركز صدارة المنطقـة بأن توفر لطلابهـا وباحثيها مجموعـة من البرامج الهندسيـة المعتمدة دوليـا والتي تتميز بالمهنيـة والبحث العلمـي والمساهمـة في تنميـة المجتمع.

الرسالـــة:

توفير قاعدة تعليميـة وبحثيـة عريضـة ذات ثقافـة بريطانيـة من خلال الشراكـة البريطانيـة والعالميـة لمنح درجـات علميـة معتمدة دوليـا تمكن الخريجين من تطوير معارفهم ومهاراتهم وروح المبادرة لديهم والمساهمـة في تنميـة المجتمع.

الأهداف:

1- توفير بيئـة تعليميـة بحثيـة ذات جودة عالية قادرة على جذب الطلاب المتميزين وتزويدهم بالقدرة على تلقي التعليم والبحث ونقل المهارات والمعرفـة ليكونوا مبدعين.
2- أن تكون كلية الهندسة – الجامعـة البريطانيـة في مصر – مركزا لريادة البحث في مصر ومنطقة الشرق الأوسط.
3- أن تكون كلية الهندسة نقطة محورية للمعرفة والحلول وللموارد والخدمات الاستشارية لقطاع الهندسة والمجتمع في مجالات عديدة، وتقديم الخبرة ذات الجودة العالية لتحفيز ودعم الطلب على الحلول المبتكرة، ونقل المعرفة والتعاون في دعم التنمية الاقتصادية.
4- ضمان توفير الهياكل والآليـات اللازمـة لدعم الطموح الأكاديمي والنجاح.

مـــادة (2): أقســام الكليـــة:

تشتمل كليـة الهندسـة بالجامعـة البريطانيـة في مصر على ستـة أقسـام تحتوي على ثمانيـة برامج كالتالي: -

1- الهندسـة المعماريـة.
2- الهندسـة المدنية.
3- هندسة وإدارة التشييد.
4- هندسـة الإلكترونيات والاتصالات.
5- هندسـة الحاسبات.
6- الهندسة الميكانيكية.
7- هندسـة البترول وتكنولوجيا الغاز.

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8- الهندســة الكيميائيــة في التخصصات التاليــة (بدءا من السنــة النهائيــة):
a. الهندســة البيئيــة.
b. الهندســة الدوائيــة.
c. هندســة البتروكيماويــات.
9- قسم العلوم الأساسيــة.

مــادة (3): المقررات الدراسيــة

- تقوم لجنـة التعليم والتعلم بالنظر في شئون المقررات في كافـة التخصصات ولها أن تكلف أعضاء أخرين في التخصصات المختلفـة لإبداء الرأي قبل العرض على مجلس الكليــة.
- يصدر كل قسم ملحق يبين توصيف البرامج والمقررات الدراسيـة موزعــة على الفصلين الدراسيين لسنوات الدراســة.

مــادة (5): شروط قيد الطلاب

- تقبل الجامعة الطلاب المصريين والأجانب الحاصلين على شهادة الثانوية العامة أوما يعادلها بحد أدنى يحدده مجلس الجامعات الخاصة ومجلس الجامعة سنوياً وتحدد اللوائح الداخلية للجامعة وكلياتها الشروط الأخرى الواجب توافرها لقبول الطلاب وكذلك التى تلزم لمنح أيا من الدرجات العلمية المشار إليها طبقا لكل مرحلة.

مــادة (6): سمات نظام الدراسة بنظام النقاط المعتمدة

- الدراسـة بالكلية بنظـام النقـاط المعتمدة التـي تتمشـى مـع النظـام البريطـانى وتبين اللـوائح الداخلية للأقســام مـواد الدراسـة المختلفة وتوزيـع مقرراتها الإجبارية والاختيارية على مراحل الدراسة للأقســام المختلفة وعدد الساعات المقرره والنقاط المحصله المعتمدة لكل مقرر. وتحـدد الكليـة فـى ضـوء اقتـراح مجـالس الأقسـام المختصـة المحتـوى العلمـى لكـل مقرر, ويصـدر باعتمادهـا قـرار مـن مجلـس الجامعـة. وذلـك فـى ضـوء التطـور المسـتمر للعملية التعليمية بناءا على التطور في العلوم والتكنولوجيا.
- يتكون البرنامج الدراسى للحصول على درجة البكالوريوس من السنة الاعدادية ثم اربع سنوات فى التخصص.
- الدراسة باللغة الإنجليزية في الكلية وفقاً لهذه اللائحـة، وبما يتوافق مع اللائحـة الاكاديمية العامـة للجامعة General Academic Regulations (GAR) المعتمدة من الجامعة البريطانية فى مصر والجامعة البريطانية التي اعتمدت البرامج الدراسية أكاديميا.

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- يكتسب الطالب 10 نقاط (credits) لكل مقرر يجتازه بنجاح. وفى بعض المقررات يكتسب الطالب 5 أو 15 أو 20 نقطة معتمده أو أكثر طبقاً لنوع المقرر بحيث لا يزيد المسموح للطالب بأكتسابه عن 120 نقطة معتمده فى العام الدراسى الواحد من مقررات الفرقة الدراسية المسجل بها الطالب.
- طبقاً للنظام البريطانى فأن 10 نقاط معتمده تعادل 3 ساعات معتمده.
- يجوز لعميد الكلية بناءا على توصية مجلس القسم وموافقة مجلس الكلية زيادة النقاط المعتمدة عن الحدود المذكورة أعلاه وذلك في حالات الضرورة.
- لا ينقل الطالب من فرقة إلى فرقة أعلى إلا إذا أكتسب 120 نقطة معتمده على أن يعقد له أختبار فيما رسب فيه قبل بدء العام الدراسي التالي بحد أقصى 60 نقطة.
- يحسب التقدير العام لنجاح الطالب عن كل فرقة وفقاً للتقديرات التى يحصل عليها وفقاً للنظام الذى تحدده اللائحة الأكاديمية العامة للجامعة مع مراعاة ألا يزيد تقديره على مقبول فى المقرر الذى سبق أن رسب فيه أوتغيب عنه بغير عذر مقبول أما إذا كان قد تغيب بعذر مقبول فيحسب له تقدير النجاح الذى يحصل عليه.

مـادة (7): شهادات البكالوريوس التي تمنحها الكليـة

تمنح الجامعـة البريطانيـة في مصر بناء على طلب مجلس كليـة الهندسـة درجـة البكالوريوس في أحد التخصصـات الآتيـة: -

1- الهندسـة المعماريـة.
2- الهندسـة المدنيـة.
3- هندسـة وإدارة التشييد.
4- هندسـة الإلكترونيـات والاتصالات الكهربيـة.
5- هندسـة الحاسبات.
6- الهندسـة الميكانيكيـة.
7- هندسـة البترول وتكنولوجيا الغاز.
8- الهندسـة الكيميائيـة:.
   a. تخصص الهندسـة البيئيـة.
   b. تخصص هندسـة البتروكيماويـات.
   c. تخصص الهندسـة الدوائيـة.

مـادة (8): مواعيد الدراسة والقيد

- تقوم الدراسة بالجامعة على نظام الفصلين الدراسيين بواقع 15 أسبوع لكل فصل دراسي.
- تبدأ الدراسة فى سبتمبر من كل عام وتنتهى في يونيه من العام التالى ويصدر بتحديد موعد بدء الدراسة ونهايتها وعطلة نصف العام قرار من مجلس الجامعة.
- ولمجلس الأمناء أن يقرر بدء الدراسة أوإنتهائها قبل الموعد المحدد أوبعده بناء على ما يقترحه مجلس الجامعة.
- يقيد الطالب بالكلية بناء على طلب يقدمه للجامعة بعد إستيفاء أوراقه وأداء الرسوم المقررة ويعد ملف لكل طالب يحتوى على جميع أوراقه.

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مـــادة (9): مدة الدراسة

- مدة الدراسة للطالب المنتظم عشرة فصول دراسية رئيسية (خمس سنوات)، تبدأ بسنة إعدادية عامة لجميع الطلاب ويكون التخصص بعد ذلك طبقا لرغبات الطلاب ومتطلبات الأقسام المختلفة.

مـــادة (10): شروط التسجيل

- شروط القيد هى شروط التسجيل نظرا لأن البرنامج يتبع نظام السنوات(النقاط المعتمدة) كما هو مبين بالبند رقم 3 وليس الساعات المعتمدة .
- كل طالب ينبغى أن يحصل فى العام الدراسى الواحد على 120 نقطة.
- التحاق الطالب بأيا من البرامج المطروحة بناء على رغبته وكذلك الشروط التى تحددها الكلية فى حالة زيادة الاعداد عن العدد المخطط له.

مـــادة (11): مكونات البرامج الدراسية

تشتمل البرامج الدراسية على مجموعة من المقررات مقسمة طبقا للتقسيم النوعي للمجلس الأعلى للجامعات كالتالي: -

العلوم الانسانية	%10-%15
العلوم الاساسية	%20-%30
العلوم الهندسية الاساسية	%35-%40
العلوم الهندسية التطبيقية	%25-%30

مـــادة (12): متطلبات الحصول على الدرجة

- اجتياز الطالب بنجاح لجميع المقررات الدراسية وتعادل 600 نقطة معتمدة (180 ساعة معتمدة) مع العلم بأن العشر نقاط تعادل ثلاث ساعات معتمدة.
- النجاح فى مشروعى التخرج (المشروع التصميمى والمشروع البحثى).
- اجتياز مقررات التدريب الصيفى الإجباري (و التي يكون التقييم فيها ناجح / راسب)

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مــادة (13): شروط الحذف والاضافة والانسحاب

- نظرا لان البرامج تعمل بنظام السنة فلايوجد شروط للحذف والاضافة والانسحاب ولكن للطالب أن يعتذر عن الدخول فى الامتحان فى مقرر او اكثر بناء على طلب كتابى من الطالب موضحا فيه الأسباب يقدم إلى الادارات المختصة بالجامعة والكلية ويتم إتخاذ اللازم طبقا لقواعد الجامعــة.
- يسمح للطالب بالتحويل بين المواد الاختياريــة بحد أقصى الأسبوع الثاني من بدايــة كل فصل دراسي.

مــادة (14): إيقاف القيــد

يسمح للطالب التقدم بطلب إيقاف القيد لمدة عام دراسي كامل موضحا فيه الأسباب التي أدت إلي إتخاذ القرار، على أن يتم إتخاذ القرار من قبل مجلس الكليــة طبقا للوائح المعمول بها في هذا الشأن.

مــادة (14): اسلوب تقييم الطالب

- يتم توزيع درجات كل مقرر بنسب مئوية بين: أعمال الفصل الدراسى من تمارين وتقارير ومشاريع وامتحانات أثناء الفصل الدراسى وتقارير معملية وتقييم شفهى وامتحان نصف الفصل والامتحان التحريرى النهائى. كل ذلك يتم حسب طريقة التقييم الموجودة بتوصيف كل مقرر على حده.
- يشترط لكى يعد الطالب ناجحا ان يحصل على 50% على الآقل من مجموع الدرجات فى المقرر.
- لابد ان يلتزم الطالب بمتطلبات الحضور، كما هو موضح باللائحة الأكاديمية العامة للجامعة.
- يعد الطالب راسيا اذا كان مجموع درجاته فى المقرر أقل من % 50 او لم يحضر الامتحان التحريرى فى نهاية الفصل الدراسى، بدون عذر تقبله الكلية، او نتيجة للغش.
- يتم تقييم أعمال الطالب فى مقررات التدريب العملى بالشركات والندوات على أساس ناجح أو راسب ولاتدخل فى حساب المعدل التراكمى.

مــادة (15): مشاريــع التخرج

- يقوم طلبة السنــة الرابعــة بإعداد مشروعين للتخرج الأول بحثى والثانى تطبيقى وتحدد مجالس الأقسام المختصــة الموضوعــات المطروحــه.
- يتم مناقشــة مشروعي التخرج بواسطــة لجــان بها أعضــاء من الخارج لتقييم المشاريع.

مـــادة (16): تقديرات المقررات

- يحسب التقدير العام لنجاح الطالب عن كل فرقـة وفقا للتقديرات التي يحصل عليها وفقا للنظام الذي تحدده اللائحـة الأكاديميـة العامـة للجامعـة مع مراعاة ألا يزيد تقديره على مقبول في المقرر الذي سبق أن رسب فيه أو تغيب عنه بغير عذر مقبول أما إذا كان قد تغيب بعذر مقبول فيحسب له تقدير النجاح الذي يحصل عليه.
- يقدر نجاح الطالب فى مقررات مرحلـة البكالوريوس بإحدى التقديرات الآتية:- F, D, C, B, A و يوضح الجدول التالي النسب المنوية المكافئة لكل تقدير.

ألتقدير بالحروف	المقياس (%)	التقدير
A	100 - 85	امتياز
B	84 - 75	جيد جدا
C	74 - 65	جيد
D	64 - 50	مقبول
F	49 - 30	ضعيف
	29 <=	ضعيف جدا

مـــادة (17): مرتبة الشرف ومنح التفوق

- تمنح مرتبة الشرف للطالب الذى لايقل تقديره عن جيد جدا خلال جميع سنوات الدراسة
- منح التفوق تحسب على المجموع التراكمى على النحو التالى:

نسبة تخفيض الرسوم الدراسية %	الدرجة بالنسبة المئوية %
%20	من 75 الى 78
%25	من 79 الى 81
%30	من 82 الى 84
%35	من 85 الى 86
%40	من 87 الى 88

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من 89 فأكثر	%45
أول الدفعـة – أول التخصص	%100

- وبالنسبة للحاصلين على الثانوية العامة يتم خصم النسب التالية من الرسوم الدراسية:

الدرجة بالنسبة المئوية %	نسبة تخفيض الرسوم الدراسية %
من 85% إلي 89.9%	%10
من 90 الى 94.9	%20
من 95 الى 99.9	%30
100% فأكثر	%40

مـــادة (18): الإنذار الأكاديمي – الفصل من الدراسة

يرجع الى دليل الطالب Student Handbook الذي يصدر سنويا بالجامعة فيما يخص قواعد ونظام تأديب الطلاب، وما لم يرد به نص يطبق احكام قانون تنظيم الجامعات.

مـــادة (19): تحويل الطلاب ونقل قيدهم

يتم تحويل ونقل قيد الطلاب من المعاهد وكليات الجامعات المصرية أوالأجنبية لكلية الهندسة بالجامعة البريطانية فى مصر وفقاً للقواعد التالية :-

1. طـلاب الفرقـة الأولـى أوالإعداديـة يـتم تحـويلهم لكليـة الهندسـة بالجامعـة البريطانيـة فـى مصر إذا كانوا حاصلين على الثانويـة العامـة المصـرية أومـا يعادلها وعلـى الحد الأدنـى المقرر للمجموع ومستوفياً الشروط المؤهلة للقبول بالكلية وأيـة شروط اخري يقرهـا مجلس الكليـة بالنسـبة للتحويلات.
2. الطلاب المقيدين بفرق أعلى يجوز تحـويلهم إلى كليـة الهندسـة بالفرقـة التـي تؤهلهم لها المقاصـة العلميـة، مـع تأديـة الأمتحانـات اللازمـة فـى بعض المـواد أوالإعفـاء مـن مـواد أخرى على حسب قرار لجنـة المقاصات العلميـة، طبقاً لخطـة الدراسـة ووفقـاً لمـا يقرره مجلس الكلية و طبقا للائحة الأكاديمية العامة للجامعة وطبقا لأيـة شروط أخرى يقرهـا مجلس الكليـة.
3. يقبل الطالب المحول من أية جامعة أخرى كطالب مستجد بالفرقة التى يقبل بها ويتم حساب سنوات رسوبه إعتباراً من تاريخ قيده بالجامعة دون النظر لحالة القيد المحول منها.
4. يصدر باعتماد التحويل أونقل القيد قرار من رئيس الجامعة أومن ينيبه .

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مـــادة (20): قبول وتحويل الطلاب الوافدين

1. الحد الأدنى لمعدلات القبول للطلاب الوافدين بالجامعة هو المجموع الإعتبارى للدرجات فى الشهادات المعادلة على ألا يقل عن الحد الأدنى المقرر . مع توافر الشروط المؤهلة الأخرى التى تحددها الكلية والجامعـة.
2. تقدم طلبات الالتحاق مباشرة لمكتب القبول لبحثها والبت فيها وفقاً للإجراءات المنظمة لذلك متى توافرت الشروط المؤهلة للقبول بالكلية.
3. يجوز تحويل الطلاب الوافدين من الجامعات والمعاهد الأجنبية والمصرية وفقاً لقواعد التحويل الخاصة بالطلاب المصريين .
4. يتم قبول وتحويل الطلاب الوافديـن وفقا للشروط والضوابط التي يحددهـا المجلس الأعلى للجامعـات الخاصـة والأهليـة.

مــادة (21): النظـــام الكودي للمقررات الدراسيـــة

- يشتمل النظام الكودى للمقررات الدراسيـة (I6CIVL03C على سبيل المثال) على الأتي: -
  - أول رقميـن من ناحيـة اليسار وهو رقم متغير يدل على السنـة الدراسيـة.
  - يليـه أربعـة حروف تدل على القسم التابع لـه المقرر الدراسي.
  - يليـة رقميـن للدلالـة على ترتيب المقرر الدراسي في المستوى التابع لـه ضمن باقـي المقررات الدراسيـة من ذات المستوى.
  - أما بالنسبـة للحرف الأخير (C, H & I) فهي تعبر عن مستوى المقرر الدراسي، حيث أن الـ C هي المستوى الأول والـ I للمستوى الثاني وأخيرا الـ H للمستوى الثالث.
  - بالنسبـة لمقررات العلوم الأساسيـة والتـي يقوم بتدريسهـا مجموعـة العلوم الأساسيـة، فإنه يرمز لها جميعا بالكود SCIB.

وزارة التعليم العالي
الإدارة العامة للجامعات الخاصة
التوقيع

موافقة مجلس الكليـة بجلسته (5) بتاريخ 2017/4/19

وفيما يلي جدول يوضح النظام الكودي لمرحلة البكالوريوس بكليـة الهندسـة – الجامعـة البريطانيـة

م	القسـم	الرمز
.1	الهندسـة المعماريـة	ARCH
.2	الهندسـة المدنيـة (إنشاءات)	CIVL
.3	الهندسـة المدنيـة (إدارة التشييد)	CEM
.4	الهندسـة الكيميائيـة	CHME
	هندسـة البتروكيماويات	PECE
	هندسـة البيئـة	ENVCE
.5	الهندسـة الكهربية (إلكترونيات)	ECE
	الهندسـة الكهربية (حاسب)	COMP
.6	الهندسـة الميكانيكيـة	MECH
.7	هندسـة البترول وتكنولوجيا الغاز	PTRL
.8	العلوم الأساسيـة	SCIB

وفيمايلى جدول يوضح النظام الكودى لمرحلة الدراسات العليا بكلية الهندسة

الجامعة البريطانية بمصر

م	الدراسات العليا	
	اسم البرنامج	الرمز
1	هندسة المواد المتقدمة	MAT
2	هندسة الطاقة المتجددة	REN
3	هندسة التصميم والتشييد المستدام	STDC

مواصفات برنامج الهندسة المعمارية

Specifications of Architectural Engineering Programme

Throughout history, architecture has witnessed some of the most significant cultural and civilizational reflections. In today's world, architects are called upon to address critical global issues by taking responsibility for the built environment, responding to societal needs, and conserving natural resources. The programme is dedicated to providing well-rounded future generations of skilled professional architects through an education that is culturally rooted, theoretically supported, and technologically advanced. This programme is dedicated to the sustainability of creativity through knowledge and practice.

Graduates of the Architectural Engineering programme are expected to improve their critical thinking skills and design creativity in order to assume leadership roles in the professional practice.

Graduates will be able to work in architectural design firms in areas such as design, tender documents, urban design, and detailed planning. Furthermore, they will be qualified to work in the construction industry, building technology, rehabilitation, building conservation, urban context, and physical planning. They can also pursue graduate studies at universities or research institutes.

This specification provides the main features of the programme competencies that a typical student might reasonably be expected to achieve and demonstrate if full advantage is taken of the learning opportunities that are provided.

1. Basic Information

1	**Programme title**	**Architectural Engineering**
2	**Name of the final award**	**BSc with honours [validated by UK partner]**
3	**Awarding body/institution**	**The British University in Egypt**
4	**Faculty**	**Engineering**
5	**Department**	**Architecture**
6	**Dean**	**Prof. Maguid Hassan**
7	**Head of Department (HoD)**	**Prof. Ayman Othman**
8	**Programme Director (PD)**	**Dr. Marwa Adel**
9	**Professional, Statutory and Regulatory Body Accreditation**	**Egyptian Engineering Syndicate**
10	**Date of last initial internal review and updates**	**10th April 2017**
11	**Approval Date to adopt NARS 2018 by:** **Departmental Council** **Faculty Council**	- **6th October 2020** - **10th October 2020**

2. Programme Mission

The Programme Mission includes the following:

The mission of the programme is to provide a positive educational environment on the British ethos that helps equipping graduates with contemporary knowledge in the architectural field. In addition, graduates are provided with cognitive, practical and entrepreneurship skills that qualify them to contribute to the development of Egypt and MENA region as well as to compete at the local and regional levels. Moreover, graduates can play an important role in improving the architectural engineering profession to address global environmental and technological challenges. Faculty members are required to produce applied and scientific research at local and international levels to provide community services.

3. Programme Aims

The aims of this programme are to:

- prepare distinguished graduate able to compete.
- achieve excellence in teaching and learning.
- achieve excellence in scientific research.
- expand the role of the department towards serving the community.
- develop the Department's Human Resources.
- enhance the Departmental supporting infrastructure.

4. Distinctive Features of the Programme

The BUE delivers programmes based on a British philosophy of education. This results in programme that is very much focused on the students rather than those who deliver the material. Graduates from UK programmes typically exhibit:

- the ability to think creatively and with strong problem-solving skills.
- high level key and transferable skill sets.
- independently maintained high level of professional and subject specific as well as general technical competence (often through CPD).
- the ability to consider problems at a high level (i.e., to see the big picture);
- diligence and ethical working practices.
- flexibility and the ability to apply their subject-specific knowledge to fields outside their own.

The BUE Mission is to be the leading provider of high-quality UK style education in the MENA region. The University is committed to ensuring UK validation of its programmes and to ensure a student experience that is in line with UK standards. Built on top of institutional quality assurance is subject level validation and the faculty is committed to ensuring that its UK validating partners confirm that its degree programme is in line with UK standards. An outcome of this will be the dual award of both an Egyptian BSc and a BSc from a UK validating partner in Architectural Engineering.

Furthermore, we will be seeking accreditation of this degree programme with the Chartered Institute of Building, the UK's leading professional body for this programme discipline. Accredited degree programmes are the preferred and fast track routes for those who aim to obtain the professional qualification of membership in the Chartered Institute of Architectural Technologists.

For a brief overview on the requirements of the Chartered Institute of Architectural Technologists and why it is important to gain membership refer to: https://architecturaltechnology.com/

At the time of writing, and to the best of our knowledge, this combination of academic and professional accreditation makes our programme in Architectural Engineering quite unique in both Egypt and the surrounding region.

5. Relevant Subject Benchmark Statements and other External and Internal Reference Points Used to achieve Programme Outcomes

To ensure that the programme complies with the requirements of relevant national and international AE professional institutions/bodies, and to qualify graduates to apply for memberships in respective institutions and/or gain Chartered Engineer status, the following are used as reference points to inform the programme outcomes:

- Part A: Setting and Maintaining Academic Standards PART A:The Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies October 2014 www.qaa.ac.uk/en/Publications/.../qualifications-frameworks.pdf
- QAA guidelines for preparing programme specifications *http://www.qaa.ac.uk/academicinfrastructure/programmeSpec/default.asp*.CIOB (Chartered Institute of Building)*http://www.ciob.org.uk/*
- RIBA (Royal Institute of British Architects): RIBA Description &Regulations for the Recognition of Courses and Examinations in Professional Practice and Management,*http://www.architecture.com/*
- UIA (International Union of Architects): UIA Description &Regulations for the Recognition of Courses and Examinations in Professional Practice and Management,*http://www.uia-architectes.org/*
- *QAA Subject Benchmark Statements: Engineering, February 2015 http://www.qaa.ac.uk/publications/information-and-guidance/publication?PubID=2910#.VzGeXU9jQ-8*
- *Engineering Council Accreditation of Higher Education Programmes: UK Standard for Professional Engineering Competence - UK SPEC 3rd Edition - http://www.engc.org.uk/UKSPEC*
- *QAA subject benchmark statement: Architecture 2010 http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Architecture.pdf*
- *SEEC (2016). Credit Level Descriptors for Higher Education. Southern England Consortium for Credit Accumulation and Transfer www.seec.org.uk.*
- The Architecture programme originally adopted NARS 2009 and upon the issuing of national Academic Reference Standards (NARS 2018 for Engineering 2nd edition), the programme performed a gap analysis with additional action plan to bridge all gaps if any. Hence, the programme specification is updated to comply with National Academic Reference Standards (NARS 2018) developed by The National Authority of Quality Assurance and Accreditation of Education (NAQAAE), https://admin.naqaae.eg/api/v1/archive/download/34733).

6. Graduate Attributes

The creative way of approaching all engineering challenges is being seen increasingly as a 'way of thinking' which is generic across all disciplines. The Architectural Engineering Programme adopted the NARS 2018 attributes for Engineering and Architectural Engineering. The graduates of engineering programmes should have the ability to:

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.
2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.
3. Behave professionally and adhere to engineering ethics and standards.
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.
7. Use techniques, skills, and modern engineering tools necessary for engineering practice.
8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.
9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.

In addition to the general attributes of engineer, the architect must be able to:

i. Design robust architectural projects with creativity and technical mastery using up to date information and communication technology (ICT).
ii. Demonstrate investigative skills, attention to details and use communication methods to develop clear and effective conclusions in written, oral, and graphical formats.
iii. Adopt a holistic problem-solving approach for complex, ambiguous, and open-ended challenges and scenarios using latest technologies.
iv. Demonstrate knowledge of cultural diversity, differences, and the impact of a building on community character and identity.
v. Apply the creative problem-solving techniques, individually or in a group to plan for a design or research project through managing workload, limited resources in an efficient manner.
vi. Recognize the new role of architectural engineer who is committed to professional standards and ethics towards developing sustainable design projects.

University Requirements

The university is considered a core of Human Thinking at its highest level, and the source of investment and development of human resources. It is concerned with the rise of the Arabian Civilization and the Historical Heritage of the Egyptian Society, and its traditions. It is also concerned with the education of Religion, Morals and Nationalism (Egyptian National Law for Universities, Law 49 for Year 1972). Therefore, BUE graduates should be able to or aware of:

- National, regional, and international contemporary issues, to have an intellectual and enlightened personality and to interact effectively in the community through different communication skills.
- To achieve this goal, BUE has designed several courses planned to build the student personality, develop his/her skills, and increase his/her awareness of different topics. These courses are listed in Table 6.

Faculty Requirements

The Architectural programme offered at the Faculty of Engineering, the British University in Egypt, is an Engineering Programme. The graduates have the privilege of being Engineers and are automatically enrolled in the Egyptian Engineering Syndicate (EES). The graduates are also entitled to take the Fundamentals of Engineering Exam offered by the National Council of Examiners for Engineering and Surveying (NCEES), based on the agreement between EES and NCEES.

Competencies for Engineering Graduates

According to the **National Academic Reference Standards (NARS-2018),** the **Engineering Graduate must be able to (A-Level):**

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
A2. Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.
A5. Practice research techniques and methods of investigation as an inherent part of learning.
A6. Plan, supervise and monitor implementation of engineering projects.
A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
A9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

- Courses required to achieve these competencies (A-level) are listed in Table 7

Discipline Requirements (Architectural Engineering Requirements)

According to the National Academic Reference Standards (NARS-2018), each Architectural graduate must meet specific competencies. Thus, in addition to the Competencies of all Engineering Programmes (A-Level), the Architectural Engineering graduate must be able to (B-Level):

B1. Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies, and human sciences.

B2. Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.

B3. Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of structural design, construction, technology, and engineering problems associated with building designs.

B4. Transform design concepts into buildings and integrate plans into overall planning within the constraints of project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.

B5. Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.

- Courses required to achieve these competencies (B-level) are listed in Table 8

Programme Competencies for UK Requirements:

The Architectural Engineering Programme adopted the National Academic Reference Standards (NARS) issued in 2018 at the level of competencies (A & B) considering (A) as general competencies for all engineering graduates and (B) as specialized competencies for architectural Engineering graduates.

Given the requirements of the British partner, the Programme also adopted Academic Reference Standards (ARS) at level (C) to meet the requirements of QAA, subject benchmark statement: Architecture and UK standards for professional engineering competencies.

C1. Develop a commitment to professional standards on a personal level, recognize obligations to society, profession and the environment through exercising design practices that show responsibilities in an ethical manner.

C2. Use information and communication technology (ICT) to communicate and analyse complex issues in a systematic and creative manner, while employing communication methods and conclusions that are clear and effective in written, oral, and graphical formats.

C3. Implement the necessary steps through planning a design or research project using problem solving skills in an innovative manner either individually or as a team member while managing workloads, limited resources of information, money, and time effectively and in a self-directed manner.

- Courses required to achieve these competencies (C-level) are listed in Table 9

7. Programme Structure, Levels, Modules, Credits and Awards.

Credit Point System

- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) to be awarded a UK validated degree. This is in addition to the specialist courses (modules) and other requirements of the Egyptian Supreme Council of Universities required for the Egyptian degree.
- The programme is divided into teaching units called modules (courses), which are each assigned a credit weighting.
- Each module (course) is assigned a Level, number of credits and weighting, this reflects the depth of learning required in the relevant programme year.
- A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 36 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study and assessment.
- Students study modules (courses) with a combined weight of 120 credit points in each year (60 credit points per semester)
- Modules (courses) that are delivered in one semester have their assessment completed within the semester in which they are taught. The programme is structured such that formal examinations can take place at the end of each semester.

Academic Semesters

- The academic year is divided into two semesters: Semester 1 and Semester 2.
- Each semester is 15-weeks in length.
- Week 13 being a revision week, and weeks 14- 15 being assessment weeks at the end of each semester.
- The Academic year includes a summer assessment period where students can resit-failed modules (courses).

Programme Levels

- The whole programme, of total 600 credit points, is divided into four levels P, C, I and H (120 for P and 160 for each of C, I and H), according to the Framework for Higher Education Qualifications of UK Degree-Awarding Bodies.
- These levels reflect the depth of learning required in the relevant programme year.
- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) of the UK Degree-Awarding Bodies to be awarded a UK validated degree, in addition to the Egyptian degree.
- Each programme is also divided into **four levels of competencies, as per the NARS 2018**, as follows:
    - Level (0) university requirements
    - Level (A) Faculty requirements
    - Level (B) Discipline requirements
    - Level (C) Programme requirements

Duration of Study

- The duration of Study is five years (10 semesters) including a Preparatory Year.

Programme Structure

- All taught undergraduate programmes at BUE are modular in structure.
- The Architectural Programme is assigned as a credit weighting. A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 35 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study, and assessment. The maximum credit weighting for any one module is normally 30 credits.
- Modules that are delivered over two semesters have 20-50% of their assessment completed in semester one and the remainder in semester two, with formal examinations (where applicable) taking place in weeks 14 to 15 of semester two.

8. Conformity of the Architectural Engineering Programme to Supreme Council of Universities (SCU) Guidelines

The SCU guidelines consists of seven major categories that run throughout the whole programme; namely: Human and Social Sciences; Mathematics and Basic Science, Basic Engineering Science, Applied Engineering Sciences, Computer Applications and ICT, Projects and Practice and Discretionary (Institution character- identifying) Subject with range of weights of [9-12%], [20-26%], [20-23%], [20-22%], [9-11%], [8-10%], and [6-8%] respectively. The credits contribution, of the major categories in the Architectural programme is presented as follows:

Table 4 Indicative Curricula Content by Subject Area

Total no. of hrs / programme = 600										
Curricula Content by Subject Area		**Number of Courses**	**No of Course / levels**					**Total no. of hrs / subject area**	**% of subject area**	**Total % of NARS**
			Prep year	**DY1 (hrs)**	**DY2 (hrs)**	**DY3 (hrs)**	**DY4 (hrs)**			
A	**Humanities and social Science**	**7**	25	10	20	10	0	65	10.83	**9-12**
B	**Mathematics and Basic Science**	**12**	90	20	0	15	0	125	20.83	**20-26**
C	**Basic Engineering Science**	**12**	0	50	40	35	0	125	20.83	**20-23**
D	**Applied Engineering and Design**	**12**	0	40	30	35	20	125	20.83	**20-22**

E	**Computer Applications and ICT**	**6**	5	0	10	10	30	55	9.16	**9-11**
F	**Projects and Practice**	**2**	0	0	0	15	50	65	10.83	**8-11**
G	**Discretionary (Institution character-identifying) Subject**	**4**	0	0	20	0	20	40	6.66	**6-8**
	Total No. of hrs /DY	**55**	120	120	120	120	120	600	100	

Table 5 Major Categories of the Architectural Engineering Programme

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character- identifying) Subject
		University Requirements								
P	ENGENGL01	English for Academic Purposes	10	X						
P	ENGENGL02	English and Academic Writing	10	X						
1	ARCH17C	Technical Writing for Architects	10		X					
1	ARCH06C	History of Architecture (1)	10	X						
2	ARCH12C	Principles of Management for Architectural Engineers	10							X
	Level A	**Faculty Requirements**								
P	ENGG01P	Engineering, Ethics and Human Rights	5	X						
P	COMP01P	Introduction to Computing	5					X		
P	MECH03P	Production Technology (1)	10							
P	MECH01P	Mechanics	10		X					
P	SCIB01P	Mathematics for Engineers (1)	10		X					
P	SCIB02P	Introductory Physics	10		X					
P	CHME01P	Chemistry for Engineers	10		X					

P	SCIB03P	Mathematics for Engineers (2)	10		X					
P	SCIB04P	Electricity & Magnetism	10		X					
P	SCIB05P	Algebra and Geometry	10		X					
P	MECH02P	Engineering Drawing and Descriptive Geometry	10		X					
1	ARCH02C	Construction Materials	10			X				
1	ARCH01C	Introduction to Structural Analysis	10			X				

	Level B	**Discipline Requirements**								
1	ARCH07C	Architectural Drawing & Design Applications	10				X			
1	ARCH16C	Architectural Design (1)	10				X			
1	ARCH19C	Surveying for Architectural Engineers	10			X				
1	ARCH18C	Introduction to Construction Methods	10			X				
1	ARCH15C	Visual Design (1)	10				X			
2	ARCH102I	Architectural Design (2)	10				X			
2	ARCH05C	Structural Drawings	10			X				
2	ARCH03I	Architectural Design Principles	10				X			
1	ARCH09C	Building Construction (1)	10			X				
1	ARCH08C	Environmental Control and Design	10			X				
1	ARCH13C	Visual Design (2)	10				X			
2	ARCH11C	Building Construction (2)	10			X				
2	ARCH06I	Building Services	10			X				
2	ARCH08I	Architectural Design (3)	10				X			
3	ARCH12I	Geotechnical Engineering	10			X				
2	ARCH07I	History of Architecture (2)	10	X						
3	ARCH16I	Project Management & Construction Economics	15		X					
2	ARCH05I	Building Construction (3)	10			X				
2	ARCH01I	Engineering Contracts & Quantity Surveying	10							X
2	ARCH10I	Theory of Architecture (1)	10	X						
3	ARCH18H	Theory of Architecture (2)	10	X						

3	ARCH14I	Working Drawings (1)	10			X				
3	ARCH13I	Interior Design (1)	10				X			
3	ARCH17I	Urban Planning					X			
3	ARCH13H	Working Drawings (2)	15			X				

	Level C	Programme Requirements								
1	ARCH14C	Computer Applications in Architecture (1)	10					X		
3	ARCH11I	Architectural Design (4)	15				X			
3	ARCH09I	Computer Application in Architecture (2)	10					X		
3	ARCH03H	Architectural Design (5)	15						X	
4	ARCH07H	Architectural Design (6)	20						X	
4	ARCHXXX	Elective (1)	10							
4	ARCH25H	BSc. Design Project [1:2]	30						X	
4	ARCH06H	Research Dissertation [1:1]	20							X
4	ARCH05H	Urban Design	10				X			
4	ARCH14H	Landscape Architecture	10				X			
4	ARCHXXX	Elective (2)	10							
4	ARCHXXX	Elective (3)	10							
		Elective Courses								
4	ARCH19H	Built Environment & Human Behaviour	10	X						
4	ARCH20H	Geographic Information Systems	10					X		
4	ARCH09H	Human Resources Management in Construction and Architecture	10				X			
4	ARCH15H	Interior Design (2)	10					X		
4	ARCH17H	Architecture of Arid Environments	10				X			
4	ARCH08H	Computer Application in Architecture (3)	10					X		
4	ARCH16H	Environmental Impact Assessment	10				X			
4	ARCH21H	Environmental Simulation	10					X		
4	ARCH22H	Facility Management in Building Life Cycle	10				X			
4	ARCH23H	Housing	10					X		
4	ARCH11H	Lean Construction	10				X			
Total			**600**	**65**	**125**	**125**	**125**	**55**	**65**	**40**

%	100	10.83	20.83	20.83	20.83	9.16	10.83	6.66

Programme Courses

Courses required to achieve University Requirements

Table 6 List of University requirements courses.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
ENGENGL01	English for Academic Purposes	10	0	4	0	4
ENGENGL02	English and Academic Writing	10	0	4	0	4
ARCH17C	Technical Writing for Architects	10	1	2	0	3
ARCH06C	History of Architecture (1)	10	2	1	0	3
ARCH12C	Principles of Management for Architectural Engineers	10	2	1	0	3
Total University requirements		50	5	12	0	17

Courses Required to achieve the General Competencies of A-level (Faculty Requirements)

A set of courses must be completed as a Faculty Requirement. These courses are divided into Basic Science Courses and Basic Engineering Courses.

Table 7 List of Faculty requirements courses.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
ENGG01P	Engineering, Ethics and Human Rights	5	2	0	0	2
COMP01P	Introduction to Computing	5	2	0	2	4
MECH03P	Production Technology (1)	10	2	2	0	4
MECH01P	Engineering Mechanics	10	2	2	0	4
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
CHME01P	Chemistry for Engineers	10	2	1	2	5
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity & Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry	10	2	3	0	5
ARCH02C	Construction Materials	10	2	1	0	3
ARCH01C	Introduction to Structural Analysis	10	2	1	0	3
Total Faculty Requirements		120	26	18	8	52

Courses Required to achieve Architectural Engineering Requirements of B-level (Discipline Requirements):

A set of courses must be completed as a Basic Architectural Engineering Requirement, in the Architectural Engineering Programme.

Table 8 List of Discipline requirements courses (Architectural Engineering)

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
ARCH07C	Architectural Drawing & Design Applications	10	1	3	0	4
ARCH16C	Architectural Design (1)	10	1	3	0	4
ARCH19C	Surveying for Architectural Engineers	10	2	-	1	3
ARCH18C	Introduction to Construction Methods	10	2	1	0	3
ARCH15C	Visual Design (1)	10	1	4	0	5
ARCH102I	Architectural Design (2)	10	1	3	0	4
ARCH05C	Structural Drawings	10	1	2	0	3
ARCH03I	Architectural Design Principles	10	1	2	0	3
ARCH09C	Building Construction (1)	10	1	3	0	4
ARCH08C	Environmental Control and Design	10	1	2	0	3
ARCH13C	Visual Design (2)	10	2	2	0	4
ARCH11C	Building Construction (2)	10	1	3	0	4
ARCH06I	Building Services	10	2	2	0	4
ARCH08I	Architectural Design (3)	10	1	3	0	4
ARCH12I	Geotechnical Engineering	10	2	1	0	3
ARCH07I	History of Architecture (2)	10	1	2	0	3
ARCH16I	Project Management & Construction Economics	15	2	2	0	4
ARCH05I	Building Construction (3)	10	1	3	0	4
ARCH01I	Engineering Contracts & Quantity Surveying	10	2	1	0	3
ARCH10I	Theory of Architecture (1)	10	2	1	0	3
ARCH18H	Theory of Architecture (2)	10	2	1	0	3
ARCH14I	Working Drawings (1)	10	1	3	0	4
ARCH13I	Interior Design (1)	10	2	1	0	3
ARCH17I	Urban Planning	10	1	2	0	3
ARCH13H	Working Drawings (2)	15	1	4	0	5
Total		260	35	54	1	90

Courses Required to achieve the Competencies of C-level (Programme Competencies for UK Requirements):

Courses Required to get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed:

Table 9 List of Programme requirements courses (Architectural Engineering)

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	University Requirements	50	5	12	0	17
	Faculty of Engineering Requirements	120	26	18	8	52
	Discipline Architecture Requirements	260	35	54	1	90
University + Faculty + Discipline Requirements Total		**430**	**66**	**84**	**9**	**159**
ARCH14C	Computer Applications in Architecture (1)	10	1	2	-	3
ARCH11I	Architectural Design (4)	15	1	4	-	5
ARCH09I	Computer Application in Architecture (2)	10	1	2	-	3
ARCH03H	Architectural Design (5)	15	1	4	-	5
ARCH07H	Architectural Design (6)	20	1	5	-	6
ARCHXXX	Elective (1)	10	2	1	-	3
ARCH25H	BSc. Design Project [1:2]	30	1	6	-	7
ARCH06H	Research Dissertation [1:1]	20	2	3	-	5
ARCH05H	Urban Design	10	1	2	-	3
ARCH14H	Landscape Architecture	10	1	2	-	3
ARCHXXX	Elective (2)	10	2	1	-	3
ARCHXXX	Elective (3)	10	2	1	-	3
Total		170	16	33	-	49
University + Faculty + Discipline + Programme Requirements Total		**600**	**82**	**117**	**9**	**208**

Proposed Study Plan

To get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	Preparatory Year - Semester (1)					
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
MECH01P	Engineering Mechanics *	10	2	2	0	4
CHME01P	Chemistry for Engineers *	10	2	2	0	4
COMP01P	Introduction to Computing *	5	2	0	2	4
ENGENGL01	English and Academic Purposes	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights *	5	2	0	0	2
	Total	60	12	11	4	27

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	Preparatory Year - Semester (2)					
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry *	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry *	10	2	3	0	5
MECH03P	Production Technology *	10	2	2	0	4
ENGENGL02	English and academic writing	10	0	4	0	4
	Total	60	10	14	2	26

*** Modules that are taught to half the cohort in semester one and the other half in semester two.**

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY1 - Semester (1)					
ARCH07C	Architectural Drawing & Design Applications	10	1	3	-	4
ARCH06C	History of Architecture (1)	10	2	1	-	3
ARCH18C	Introduction to Construction Methods	10	2	1	-	3
ARCH01C	Introduction to Structural Analysis	10	2	1	-	3
ARCH15C	Visual Design (1)	10	1	4	-	5
ARCH17C	Technical Writing for Architects	10	1	2	-	3
	Total	60	9	12	-	21

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY1 - Semester (2)					
ARCH16C	Architectural Design (1)	10	1	3	-	4
ARCH19C	Surveying for Architectural Engineers	10	2	1	-	3
ARCH09C	Building Construction (1)	10	1	3	-	4
ARCH02C	Construction Materials	10	2	1	-	3
ARCH08C	Environmental Control and Design	10	1	2	-	3
ARCH13C	Visual Design (2)	10	2	2	-	4
	Total	60	9	12	-	21

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 - Semester (1)					
ARCH102I	Architectural Design (2)	10	1	3	-	4
ARCH03I	Architectural Design Principles	10	1	2	-	3
ARCH11C	Building Construction (2)	10	1	2	-	3
ARCH06I	Building Services	10	2	2	-	4
ARCH14C	Computer Applications in Architecture (1)	10	1	2	-	3
ARCH07I	History of Architecture (2)	10	1	2	-	3
	Total	60	7	13		20

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 - Semester (2)					
ARCH08I	Architectural Design (3)	10	1	3	-	4
ARCH05I	Building Construction (3)	10	1	3	-	4
ARCH01I	Engineering Contracts & Quantity Surveying	10	2	1	-	3
ARCH12C	Principles of Management for Architectural Engineers	10	2	1	-	3
ARCH05C	Structural Drawings	10	1	2	-	3
ARCH10I	Theory of Architecture (1)	10	2	1	-	3
	Total	60	9	11	-	20

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 – Summer Semester					
ENGG03I	Industrial Training Placement (1)	0	0	0	0	0

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY3 - Semester (1)					
ARCH11I	Architectural Design (4)	15	1	4	-	5
ARCH12I	Geotechnical Engineering	10	2	1	-	3
ARCH16I	Project Management & Construction Economics	15	2	2	-	4
ARCH18H	Theory of Architecture (2)	10	2	1	-	3
ARCH14I	Working Drawings (1)	10	1	3	-	4
	Total	60	8	11	-	19

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY3 - Semester (2)					
ARCH03H	Architectural Design (5)	15	1	4	-	5
ARCH09I	Computer Application in Architecture (2)	10	1	2	-	3
ARCH13I	Interior Design (1)	10	2	1	-	3
ARCH17I	Urban Planning	10	1	2	-	3
ARCH13H	Working Drawings (2)	15	1	4	-	5
	Total	60	6	13	-	19

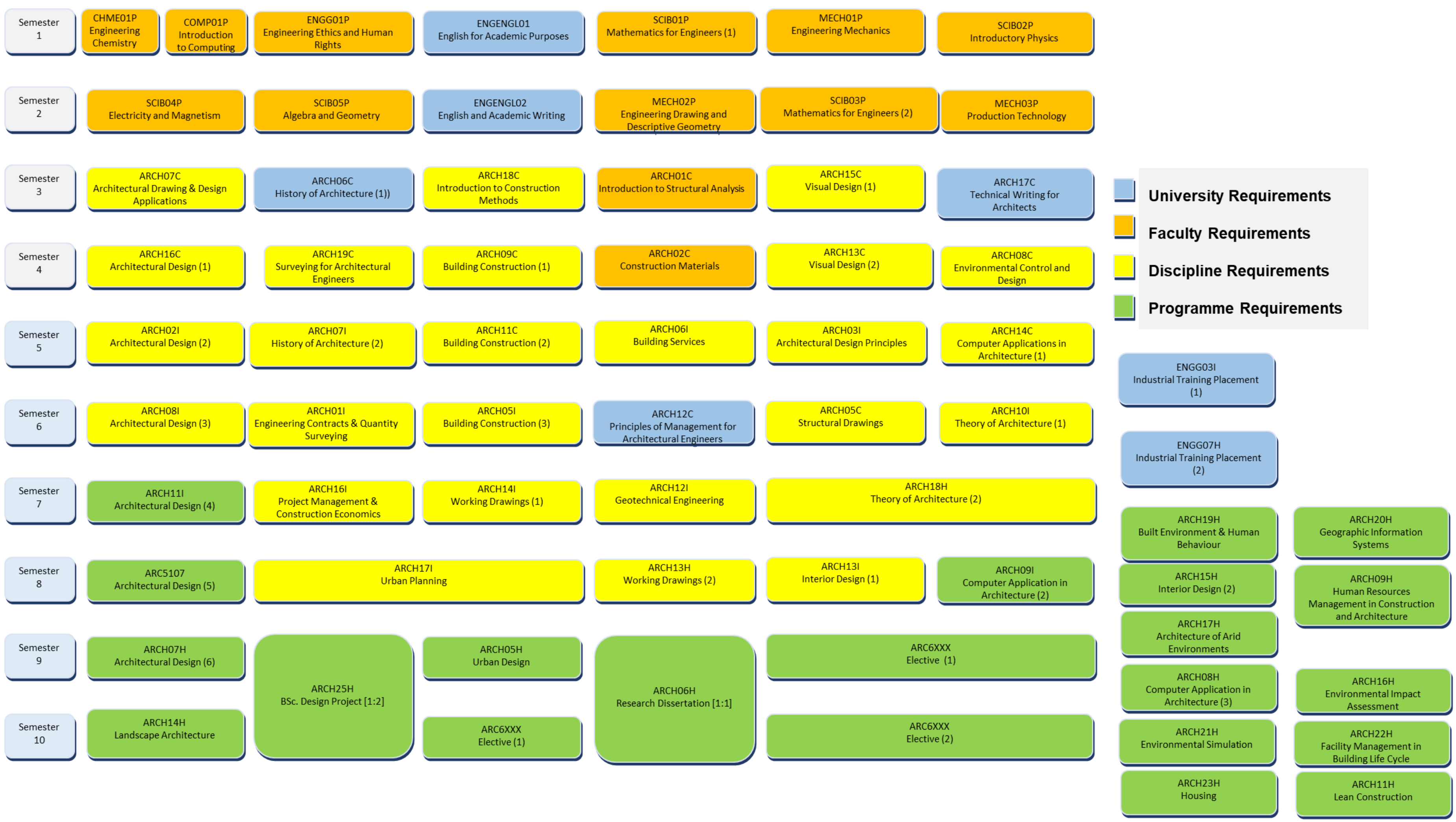
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY3 – Summer Semester					
ENGG07H	Industrial Training Placement (2)	0	0	0	0	0

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY4 - Semester (1)					
ARCH07H	Architectural Design (6)	20	1	5	-	6
ARCH25H	BSc. Design Project [1:2]	15	1	3	-	4
ARCH06H	Research Dissertation [1:1]	10	1	1	-	2
ARCH05H	Urban Design	10	1	2	-	3
ARCHXXX	Elective (1)	10	2	1	-	3
	Total	65	6	12	-	18

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY4 - Semester (2)					
ARCH06H	Research Dissertation [1:1]	10	1	2	-	3
ARCH25H	BSc. Design Project [1:2]	15	-	3	-	3
ARCH14H	Landscape Architecture	10	1	2	-	3
ARCHXXX	Elective (2)	10	2	1	-	3
ARCHXXX	Elective (3)	10	2	1	-	3
	Total	55	6	9	-	15

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 1 of Elective Courses						
	DY4 - Semester (1)					
ARCH19H	Built Environment & Human Behaviour	10	1	2	-	3
ARCH20H	Geographic Information Systems	10	1	2	-	3
ARCH09H	Human Resources Management in Construction and Architecture	10	2	1	-	3
ARCH15H	Interior Design (2)	10	1	2	-	3
	DY4 - Semester (2)					
ARCH17H	Architecture of Arid Environments	10	1	2	-	3
ARCH08H	Computer Application in Architecture (3)	10	1	2	-	3
ARCH16H	Environmental Impact Assessment	10	2	1	-	3
ARCH21H	Environmental Simulation	10	1	2	-	3
ARCH22H	Facility Management in Building Life Cycle	10	2	1	-	3
ARCH23H	Housing	10	1	3	-	4
ARCH11H	Lean Construction	10	2	1	-	3

Programme Course Tree:



9. An Overview of Teaching, Learning and Assessment Strategies to Enable Competencies to be Achieved and Demonstrated

A. Learning and Teaching Methods

Throughout the programme students are encouraged to undertake independent reading both to supplement and consolidate what is being taught and to broaden, develop and reinforce their competencies throughout the programme. Targeted delivery may come from a variety of sources such as

1. Lectures.
2. Tutorials.
3. problem solving classes.
4. laboratory exercises.
5. coursework exercises and self-study and particularly through project work undertaken both in groups and individually.
6. Studio Sessions
7. Field trips.
8. Model making workshop.
9. Guest Lectures

Further support is gained through study skills delivered as a matter of policy within both the English language programme and individual modules.

10. Support for Learning

- All resources needed for the modules (Courses) are updated and uploaded on the E-Learning [Electronic Learning - The British University in Egypt (bue.edu.eg)]
- The tutorials are designed by the module leaders (course leader) to ensure a strong link with module contents to provide students with useful, challenging, good support & practice for the material discussed in lectures.
- Students are provided with feedback related to their submissions within two weeks of submissions.
- For assessed work, feedback is provided in the form of individual written feedback on coursework and as a discussion during tutorials.
- For developmental work, feedback is delivered in the form of dialogue between students and staff in tutorials as well as individual feedback provided in tutorials.
- Weaker students are supported with additional remedial classes and clinics during office hours to uplift their performance.
- A generic exam feedback is developed and posted on E-learning after releasing scripts to students each semester. Students will be notified via e-mail once generic feedback is uploaded.
- Institutional services including the Library, Welfare Counsellor, Faculty services including a Student Support Officer and Programme Handbook.

B. Assessment

Competencies are tested and assessed throughout the programme using a variety of forms that typically include a combination of

1. Writing Assignment
2. Writing- academic essay
3. Group presentation
4. Group report
5. Group project
6. Class Test
7. Individual report
8. Individual presentation
9. Individual project
10. Individual portfolio
11. Individual One week Project
12. Practical Assessment
13. Oral Assessment
14. Design Brief
15. Lab Report
16. Interim Report
17. Student's Efforts
18. Final Submission
19. VIVA
20. Unseen Exam

Coursework forms a particularly important part of the assessment. This method of assessment can

(i) be used to strongly motivate independent learning
(ii) improve student planning and time management skills and
(iii) to develop the comprehension and usage of technical English (particularly important for students at the BUE).

Examinations show how well the student can demonstrate their mastery of an area of scholarly knowledge by selecting appropriate material from memory and applying it to an unseen question in a limited time period. Coursework allows the student to demonstrate wider academic skill of focused scholarly research, drafting, editing and polished writing.

Applied skills are tested and assessed throughout the programme using a combination of coursework assignments, design studies, laboratory logbooks, project reports and/or papers, project logbooks and work placement reports.

11. Crisis and Disaster Management

The faculty of Engineering manages crisis and disaster through the following:

1. Crisis and Disaster Committee
2. Contingency Plan
3. Health and Safety
4. Contact Trees

12. Entry Requirements

In addition to the requirements listed in Part-B, students are required to successfully complete of the Engineering Preparatory Year and passing the entry exam which evaluates student's abilities and architectural skills.

Other admission routes may be considered in accordance with the University's regulations as defined in the Undergraduate Academic Regulations.

13. Quality Assurance and Programme Enhancement

- In accordance with the University's Quality Assurance procedures, as defined in the Annual Quality Assurance and Enhancement Cycle.
- Feedback on all aspects of this programme will be obtained via standard procedures from the University's framework for quality assurance, as defined in the Annual Quality and Enhancement Cycle.

14. Programme Management

- Head of Department
- Programme Director

The programme management is mainly carried out by the HoD. However, the main task of the PD is to monitor the sound delivery of the programme, and the maintenance of academic standards and quality, in line with the University's Strategic Plan for Teaching and Learning.

In addition to the previous, monthly Departmental meetings are carried out with all department's staff members. Related issues are raised for in-depth analysis and discussion to the FTLC that in turn raises with the UTLC and Senate for final decision.

15. Appendices

1. Compatibility between the faculty mission and programme mission

<table>
<tr><th>Compatibility Points</th><th>Mission of Faculty of Engineering</th><th>Mission of Architectural Engineering Programme</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">The mission of the Faculty of Engineering is to provide a broad spectrum of education and research with a British ethos, working with UK and global partners to offer internationally recognized quality degrees that enable graduates to develop their knowledge and entrepreneurship skills and to contribute to the community development.</td><td>The mission of the programme is to provide a positive educational environment on the British ethos that helps equipping graduates with contemporary knowledge in the architectural field.</td></tr>
<tr><td>In addition, graduates are provided with cognitive, practical and entrepreneurship skills that qualify them to contribute to the development of Egypt and MENA region as well as to compete at the local and regional levels.</td></tr>
<tr><td>Moreover, graduates can play an important role in improving the architectural engineering profession to address global environmental and technological challenges. Faculty members are required to produce applied and scientific research at local and international levels to provide community services.</td></tr>
</table>

2. Mapping matrix of Programme Aims (Objectives) vs. Faculty Aims (Objectives)

Compatibility Points	Aims of Faculty of Engineering	Aims of Architectural Engineering Programme
TEACHING & LEARNING Strategic Objective	Produce employable graduates in fields of high demand across Egypt and the MENA region, through a technology enabled, high quality, and British style teaching and learning, within a vibrant 21st Century setup.	To achieve excellence in teaching and learning.
		To Prepare distinguished graduate able to compete
		To enhance the programme supporting infrastructure.
RESEARCH Strategic Objective	Produce world-class research outcome that has economic impact on Egypt's development and applications in the international arena and reflects on the international ranking of the faculty and BUE, through knowledge COMMERCIALISATION schemes via the BUE Science Park platform.	To achieve excellence in scientific research.
COMMUNITY SERVICES & ENTERPRISE Strategic Objective	Enrich the community and contribute to its development and ultimately the economic development of Egypt and the MENA region through the establishment of an integrated industrial linkage scheme via a range of platforms including the BUE Science Park.	To expand the role of the programme towards serving the community.
		To Prepare distinguished graduate able to compete.
		To develop the programme's Human Resources.

3. Mapping Matrix of Programme Aims (Objectives) vs Programme Competencies

	Programme Competencies																	
Programme Aims	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3
To Prepare distinguished graduate able to compete.						**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
To achieve excellence in teaching and learning.	**1**	**1**	**1**	**1**							**1**	**1**	**1**	**1**	**1**			
To achieve excellence in scientific research.					**1**													**1**
To expand the role of the programme towards serving the community.														**1**	**1**	**1**	**1**	
To develop the programme's Human Resources.							**1**	**1**	**1**	**1**				**1**	**1**			
To enhance the programme supporting infrastructure		**1**															**1**	

4. Mapping Matrix of Programme Mission vs Programme Competencies

	Programme Competencies																	
Programme mission	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3
The mission of the programme is to provide a positive educational environment on the British ethos that helps equipping graduates with contemporary knowledge in the architectural field.	**1**	**1**	**1**	**1**	**1**		**1**	**1**			**1**	**1**	**1**	**1**	**1**		**1**	
In addition, graduates are provided with cognitive, practical and entrepreneurship skills that qualify them to contribute to the development of Egypt and MENA region as well as to compete at the local and regional levels.	**1**	**1**	**1**			**1**	**1**		**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**		
Moreover, graduates can play an important role in improving the architectural engineering profession to address global environmental and technological challenges. Faculty members are required to produce applied and scientific research at local and international levels to provide community services.				**1**		**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

5. Mapping matrix of Programme Mission vs. Engineering Graduate Attributes

	Engineering Graduate Attributes									
Programme mission	**Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.**	**Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation**	**Behave professionally and adhere to engineering ethics and standards**	**Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.**	**Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community**	**Value the importance of the environment, both physical and natural, and work to promote sustainability principles**	**Use techniques, skills, and modern engineering tools necessary for engineering practice**	**Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies**	**Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner**	**Demonstrate leadership qualities, business administration and entrepreneurial skills**
The mission of the programme is to provide a positive educational environment on the British ethos that helps equipping graduates with contemporary knowledge in the architectural field.	**1**	**1**					**1**	**1**		
In addition, graduates are provided with cognitive, practical and entrepreneurship skills that qualify them to contribute to the development of Egypt and MENA region as well as to compete at the local and regional levels.	**1**	**1**			**1**	**1**			**1**	**1**
Moreover, graduates can play an important role in improving the architectural engineering profession to address global environmental and technological challenges. Faculty members are required to produce applied and scientific research at local and international levels to provide community services.			**1**	**1**				**1**	**1**	**1**

6. Mapping matrix of Programme Mission vs. Architectural Graduate Attributes

	Architectural Graduate Attributes					
Programme mission	**Design robust architectural projects with creativity and technical mastery**	**Demonstrate investigative skills, attention to details, and visualize/ conceptualize skills**	**Adopt a holistic problem-solving approach for complex, ambiguous, and open-ended challenges and scenarios**	**Demonstrate knowledge of cultural diversity, differences and the impact of a building on community character and identity**	**Address urban issues, planning, and community needs through design work**	**Recognize the new role of architectural engineer as the leader of design projects— who has the ability to understand, assemble, and coordinate all of the disciplines— to create a sustainable environment.**
The mission of the programme is to provide a positive educational environment on the British ethos that helps equipping graduates with contemporary knowledge in the architectural field.	1		1			1
In addition, graduates are provided with cognitive, practical and entrepreneurship skills that qualify them to contribute to the development of Egypt and MENA region as well as to compete at the local and regional levels.		1		1	1	1
Moreover, graduates can play an important role in improving the architectural engineering profession to address global environmental and technological challenges. Faculty members are required to produce applied and scientific research at local and international levels to provide community services.				1	1	1

7. Mapping matrix of Programme Mission vs. Engineering Graduate Attributes

	Engineering Graduate Attributes									
Programme Aims	**Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.**	**Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation**	**Behave professionally and adhere to engineering ethics and standards**	**Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.**	**Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community**	**Value the importance of the environment, both physical and natural, and work to promote sustainability principles**	**Use techniques, skills, and modern engineering tools necessary for engineering practice**	**Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies**	**Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner**	**Demonstrate leadership qualities, business administration and entrepreneurial skills**
To Prepare distinguished graduate able to compete.			1	1	1					1
To achieve excellence in teaching and learning.	1	1				1	1	1		
To achieve excellence in scientific research.								1		
To expand the role of the programme towards serving the community.			1	1	1				1	
To develop the programme's Human Resources.	1	1					1		1	1
To enhance the programme supporting infrastructure						1	1			

8. Mapping matrix of Programme Mission vs. Architectural Graduate Attributes

	Architectural Graduate Attributes					
Programme Aims	**Design robust architectural projects with creativity and technical mastery**	**Demonstrate investigative skills, attention to details, and visualize/ conceptualize skills**	**Adopt a holistic problem-solving approach for complex, ambiguous, and open-ended challenges and scenarios**	**Demonstrate knowledge of cultural diversity, differences and the impact of a building on community character and identity**	**Address urban issues, planning, and community needs through design work**	**Recognize the new role of architectural engineer as the leader of design projects— who has the ability to understand, assemble, and coordinate all of the disciplines— to create a sustainable environment.**
To Prepare distinguished graduate able to compete.	1	1	1	1	1	1
To achieve excellence in teaching and learning.	1	1	1			
To achieve excellence in scientific research.	1	1	1			
To expand the role of the programme towards serving the community.				1	1	1
To develop the programme's Human Resources.				1	1	1
To enhance the programme supporting infrastructure	1					

9. Mapping Matrix of Attributes of Architectural Engineering Graduates vs Programme Competencies

	Programme Competencies																	
Attribute of Engineering Graduates	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**B1**	**B2**	**B3**	**B4**	**B5**	**C1**	**C2**	**C3**
Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.	1		1							1								
Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation		1		1					1									
Behave professionally and adhere to engineering ethics and standards			1															
Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.							1											
Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community			1			1												
Value the importance of the environment, both physical and natural, and work to promote sustainability principles			1															
Use techniques, skills, and modern engineering tools necessary for engineering practice				1	1													
Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies					1													

Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner								1										
Demonstrate leadership qualities, business administration and entrepreneurial skills									1									
Attribute of Architecture Graduates	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**B1**	**B2**	**B3**	**B4**	**B5**	**C1**	**C2**	**C3**
Design robust architectural projects with creativity and technical mastery											1	1	1	1	1	1	1	1
Demonstrate investigative skills, attention to details, and visualize/ conceptualize skills	1	1					1	1	1	1								
Adopt a holistic problem-solving approach for complex, ambiguous, and open-ended challenges and scenarios	1	1	1	1			1		1									1
Demonstrate knowledge of cultural diversity, differences and the impact of a building on community character and identity											1	1	1	1	1	1	1	1
Address urban issues, planning, and community needs through design work							1				1	1	1	1	1	1	1	1
Recognize the new role of architectural engineer as the leader of design projects— who has the ability to understand, assemble, and coordinate all of the disciplines— to create a sustainable environment.						1					1	1	1	1	1	1	1	1

10. Mapping matrix of Courses vs. programme Competencies (include Prep Year)

Semester	Modules		Programme competencies																	
	Title	Code	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3
Prep Semester 1	Mathematics for Engineers (1)	SCIB01P	1	1	1							1								
	Introductory Physics	SCIB02P	1	1		1	1					1								
	Engineering Mechanics *	MECH01P	1	1	1		1													
	Chemistry for Engineers *	CHME01P	1	1																
	Introduction to Computing *	COMP01P	1	1	1	1					1	1								
	English and Academic Purposes	ENGENGL01					1		1	1	1	1								
	Engineering Ethics and Human Rights *	ENGG01P	1	1								1								
Prep Semester 2	Mathematics for Engineers (2)	SCIB03P	1	1								1								
	Electricity and Magnetism	SCIB04P	1	1	1		1					1								
	Algebra and Geometry *	SCIB05P	1		1		1			1	1	1								
	Engineering Drawing and Descriptive Geometry *	MECH02P	1	1	1	1	1	1	1	1	1	1								
	Production Technology I *	MECH03P				1	1	1												
	English and academic writing	ENGENGL02					1				1	1								

DY1 Semester 1	Architectural Drawing & Design Applications	ARCH07C	1							1	1		1	1	1			1		
	History of Architecture (1)	ARCH06C					1			1			1							
	Introduction to Construction Methods	ARCH18C	1														1			
	Introduction to Structural Analysis	ARCH01C	1	1													1			
	Visual Design (1)	ARCH15C							1	1			1							
	Technical Writing for Architects	ARCH17C								1		1								1
DY1 Semester 2	Architectural Design (1)	ARCH16C				1					1		1	1	1			1		1
	Surveying for Architectural Engineers	ARCH19C	1	1			1										1			
	Building Construction(1)	ARCH09C	1		1	1		1									1			
	Construction Materials	ARCH02C	1	1			1										1			
	Environmental Control and Design	ARCH08C		1			1								1			1		
	Visual Design (2)	ARCH13C							1	1			1							

DY2 Semester 1	Architectural Design (2)	ARCH 102I				1					1		1	1	1			1	1	1
	Architectural Design Principles	ARCH 03I	1							1	1		1					1		
	Building Construction (2)	ARCH 11C	1		1	1		1									1			
	Building Services	ARCH 06I	1		1	1		1									1		1	
	Computer Applications in Architecture (1)	ARCH 14C		1		1													1	
	History of Architecture (2)	ARCH 07I					1			1			1							
DY2 Semester 2	Architectural Design (3)	ARCH 08I				1					1		1	1			1	1	1	1
	Building Construction (3)	ARCH 05I	1		1	1		1									1			
	Engineering Contracts& Quantity Surveying	ARCH 01I	1			1		1		1	1					1	1			
	Principles of Management for Architectural Engineers	ARCH 12C				1		1			1					1	1			1
	Structural Drawings	ARCH 05C	1	1													1			
	Theory of Architecture (1)	ARCH 10I					1			1		1	1							

DY3 Semester 1	Architectural Design (4)	ARCH11I				1					1		1	1	1			1	1	1
	Geotechnical Engineering	ARCH12I	1	1			1										1			
	Project Management& Construction Economics	ARCH16I				1		1			1					1	1			1
	Theory of Architecture (2)	ARCH18H					1			1		1	1							
	Working Drawings (1)	ARCH14I	1		1	1		1									1		1	
DY3 Semester 2	Architectural Design (5)	ARCH03H				1					1		1	1	1			1	1	1
	Computer Application in Architecture (2)	ARCH09I		1		1													1	
	Interior Design (1)	ARCH13I					1			1				1					1	
	Urban Planning	ARCH17I					1		1			1	1	1				1		1
	Working Drawings (2)	ARCH13H	1		1	1		1									1		1	
DY4 Semester 1	Architectural Design (6)	ARCH07H				1					1		1	1	1			1	1	1
	BSc. Design Project [1:2]	ARCH25H				1					1		1	1	1			1	1	1
	Research Dissertation [1:1]	ARCH06H					1			1	1	1							1	
	Urban Design	ARCH05H					1		1			1	1	1				1		1
	Built Environment & Human Behaviour	ARCH19H					1				1	1	1	1					1	

	Geographic Information Systems	ARCH20H		1		1												1	1	
	Human Resources Management in Construction and Architecture	ARCH09H				1		1			1					1	1			1
	Interior Design (2)	ARCH15H					1			1				1					1	
DY4 Semester 2	BSc. Design Project [1:2]	ARCH25H				1					1		1	1	1			1	1	1
	Research Dissertation [1:1]	ARCH06H					1			1	1	1							1	
	Landscape Architecture	ARCH14H					1		1			1	1	1				1		1
	Architecture of Arid Environments	ARCH17H					1				1				1			1		1
	Computer Application in Architecture (3)	ARCH08H	1	1	1							1		1		1				1
	Environmental Impact Assessment	ARCH16H		1			1								1			1		
	Environmental Simulation	ARCH21H	1	1	1	1	1	1			1					1	1	1		1
	Facility Management in Building Life Cycle	ARCH22H	1		1	1	1			1		1		1	1	1	1	1	1	1
	Housing	ARCH23H				1	1		1			1	1	1				1		1
	Lean Construction	ARCH11H	1			1		1	1	1	1					1	1			1

11. Teaching and Learning methods vs. Programme Competencies

Programme Competencies		Teaching and Learning Methods					
		Interactive Lectures	Research	Collaborating Learning (Team Project)	Tutorials	Self Study	Labs
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. the practical applications of these underlying principles to architectural engineering and construction technology.	1			1	1	
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	1			1	1	1
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	1			1	1	
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	1			1	1	
A5	Practice research techniques and methods of investigation as an inherent part of learning.	1	1		1	1	
A6	Plan, supervise and monitor implementation of engineering projects.	1			1	1	
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	1		1	1	1	
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	1			1	1	
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	1			1	1	
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	1			1	1	

B1	Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies and human sciences.	**1**	**1**	**1**	**1**	**1**	
B2	Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**1**	**1**	**1**	**1**	**1**	
B3	Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of structural design, construction, technology and engineering problems associated with building designs.	**1**	**1**	**1**	**1**	**1**	
B4	Transform design concepts into buildings and integrate plans into overall planning within the constraints of project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	**1**	**1**	**1**	**1**	**1**	
B5	Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	**1**	**1**	**1**	**1**	**1**	
C1	Develop a commitment to professional standards on a personal level, recognize obligations to society, profession and the environment through exercising design practices that show responsibilities in an ethical manner.	**1**	**1**	**1**	**1**	**1**	
C2	Use information and communication technology (ICT) to communicate and analyse complex issues in a systematic and creative manner, while employing communication methods and conclusions that are clear and effective in written, oral, and graphical formats.	**1**			**1**	**1**	
C3	Implement the necessary steps through planning a design or research project using problem solving skills in an innovative manner either individually or as a team member while managing workloads, limited resources of information, money, and time effectively and in a self-directed manner	**1**		**1**	**1**	**1**	**1**

12. Assessment methods vs Programme Competencies

Assessment methods	Programme Competencies																	
	A1	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**B1**	**B2**	**B3**	**B4**	**B5**	**C1**	**C2**	**C3**
Listening and Note-taking								1										
Speaking								1										
Writing Assignment					1													
Writing- academic essay					1													
Online Computer Based Project																	1	
Group presentation				1		1			1		1	1	1			1		1
Group report				1		1								1	1			
Group project				1		1			1		1	1	1			1		1
Class Test	1	1			1										1			
Individual report					1			1	1	1							1	
Individual presentation				1		1			1		1	1	1			1	1	1
Individual project				1		1			1		1	1	1			1	1	1
Individual portfolio				1					1		1	1	1			1	1	1
Individual One week Project				1					1		1	1	1			1	1	1
Practical Assessment		1		1												1	1	
Oral Assessment	1		1	1			1								1		1	
Design Brief				1					1		1	1	1			1	1	1
Lab Report		1		1												1	1	
Interim Report					1			1	1	1							1	
Student's Efforts				1					1		1	1	1			1	1	1
Final Submission					1			1	1	1							1	
VIVA	1		1	1			1								1		1	
Unseen Exam					1			1			1							

13. Modules LOs vs. Programme Competencies

			Programme Competencies																	
	#	Modules	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3
DY1 Semester 1	**Architectural Drawing & Design Applications**																			
	1	Apply standard graphic techniques in architectural drawing.	1																	
	2	Identify the use of specific material representation and assembly techniques.	1																	
	3	Deduce building composition from multiple projections or building views.									1		1	1	1					
	4	Determine different views for buildings.									1		1	1	1					
	5	Produce synchronized 2D and 3D views of buildings.									1		1	1	1			1		
	6	Construct 3D physical models of buildings.									1		1	1	1					
	7	Communicate and represent architectural designs graphically.								1										
DY1 Semester 1	**Histor1 of Architecture (1)**																			
	1	describe spatial, functional and aesthetic elements of historic architecture								1			1							
	2	outline how built form can be critically analysed in relation to those elements..								1			1							
	3	define different architectural historic styles regarding to their era, building materials and spatial concepts								1			1							
	4	identify the key elements of built form.					1													
	5	analyse those elements in buildings from a range of historical periods.					1													
	6	produce coherent written/graphic critiques based on the above					1													
	7	analyse and discuss structural forms and their relationship to architectural design					1													
	8	Develop Sound Architectural Thinking.					1			1										

	9	Correlate effectively with colleagues and others through working as a member of a team					**1**			**1**										
DY1 Semester 1	**Introduction to Construction Methods**																			
	1	identify a logical sequence for a typical design and construction processes.	**1**																	
	2	describe basic building structural elements, architectural components and their function.	**1**																	
	3	recognize the various types of insulation.	**1**																	
	4	Categorize construction methods and structural systems and materials related to architectural design	**1**														**1**			
	5	classify vertical circulation elements.	**1**														**1**			
	6	relate construction practices to basic conceptual design practices;.	**1**														**1**			
	7	Demonstrate comprehensive grasp of architectural and structural constructive building components	**1**														**1**			
DY1 Semester 1	**Introduction to Structural Analysis**																			
	1	identify the basic principles underlying in the analysis and design of structures.	**1**	**1**																
	2	recognize how structural and architectural design influence one another.	**1**	**1**																
	3	define the development of stress and strain in structural members	**1**	**1**																
	4	explain basic structural forms and their behaviour.	**1**	**1**																
	5	indicate the links between form, loads, deformations, internal actions and stresses.	**1**	**1**																
	6	describe the relationship between structure and architectural form.	**1**	**1**																

	7	Analyse and discuss structural forms and their relationship to architectural design	**1**	**1**													**1**			
	8	compare the behaviour of simple beams, trusses, frames, arches and cables.	**1**	**1**																
	9	retrieve and analyse information from written and web-based sources; produce and present graphic/verbal descriptions of the above.															**1**			
DY1 Semester 1		**Visual Design (1)**																		
	1	identify the basic principles underlying in the analysis and design of structures.											**1**							
	2	recognize how structural and architectural design influence one another.											**1**							
	3	define the development of stress and strain in structural members											**1**							
	4	explain basic structural forms and their behaviour.						**1**					**1**							
	5	indicate the links between form, loads, deformations, internal actions and stresses.						**1**					**1**							
	6	Describe the relationship between structure and architectural form.						**1**					**1**							
	7	Analyse and discuss structural forms and their relationship to architectural design						**1**												
	8	compare the behavior of simple beams, trusses, frames, arches and cables.						**1**												
	9	retrieve and analyse information from written and web-based sources; produce and present graphic/verbal descriptions of the above.							**1**											
DY1 Semester 1		**Technical Writing for Architects**																		
	1	Define the type and purpose of documents used in specifying, regulating and reporting technical information.									**1**									
	2	Identify the technical problems and solutions. Moreover, Collecting, organizing, analyzing, and evaluating information.									**1**									

	3	Prepare formal short documents such as memo, letters, abstracts, design briefs and summaries that communicate technical architectural elements in accordance with requirements.																		**1**
	4	Explain data and information in the form of charts, graphs and tables.																		**1**
	5	Use computer applications in formatting documents and presenting information																		**1**
	6	Developing effective communication skills with technical staff and non-technical staff.							**1**											
	7	Write clear and concise equipment manuals, formal reports and other technical documentation.							**1**											
	8	Develop presentation skills.							**1**											
DY1 Semester 2		**Architectural Design (1)**																		
	1	Identify and discuss user needs, standards and design guidelines of a simple design assignment.				**1**					**1**									
	2	Analyse various types of data to determine spatial requirements of every space.				**1**					**1**									
	3	Create a spatial program for the design assignment based on the data gathered.											**1**	**1**	**1**					
	4	Utilize adjacency matrix to draw a spatial relations' diagram (bubble diagram).											**1**	**1**	**1**					
	5	Develop the spatial program into a design scheme.											**1**	**1**	**1**					
	6	Create a design of a simple building.												**1**	**1**					
	7	Communicate graphically a design concept of a simple design task.																**1**		
	8	Work within a group.																		**1**

DY1 Semester 2	**Surveying for Architectural Engineers**																			
	1	apply land surveying instruments (such as level, tape, theodolite, total station) together with heir use in determining angles, distances and height differences;	**1**	**1**			**1**													
	2	apply appropriate methods and standards in the measurements of spatial elements.	**1**	**1**			**1**													
	3	apply computational methods involving survey measurements.	**1**	**1**			**1**													
	4	Prepare survey plans considering appropriate dimensions and orientation, and to transfer information from plans to the field.															**1**			
	5	demonstrate practical skills in the use of surveying instruments for field surveying/setting out and to perform computations from data with an appreciation of tolerances achievable.															**1**			
	6	work as a member of a team.															**1**			
	7	make a professional presentation of on-site measurements and of information derived from these measurements															**1**			
DY1 Semester 2	**Building Construction (1)**																			
	1	review the history and concepts of building systems;	**1**																	
	2	describe different building materials;	**1**																	
	3	describe the different building methods, bonds, tools, wall thickness, openings;			**1**	**1**														
	4	explain the construction systems of lintels, arches, vaults and domes;			**1**	**1**														
	5	select suitable damp proofing, heat and sound insulation;			**1**	**1**														
	6	produce building details for specific interior and exterior solutions;															**1**			
	7	develop architectural detailed design to building construction elements and other spatial features in masonry and timber structure.						**1**												

DY1 Semester 2	**Construction Materials**																			
	1	describe the properties and manufacture of concrete, concrete constituents, masonry and various other materials commonly used in the Construction Industry.	**1**	**1**																
	2	identify the standard tests required for each material and constituent.	**1**	**1**																
	3	describe each material's key engineering properties.	**1**	**1**																
	4	describe the material's manufacture and jointing, including the effects on its properties and quality control testing.	**1**	**1**																
	5	identify the principal applications of engineering materials and the implications for design, construction and maintenance.	**1**	**1**																
	6	conduct standard destructive and non-destructive tests on concrete constituents and other construction materials.	**1**	**1**			**1**													
	7	analyse and evaluate test results and compare them to practical norms.	**1**	**1**			**1**										**1**			
	8	arrange safety procedures in a lab facility.	**1**	**1**			**1**										**1**			
	9	collect, observe, record, and report data from the laboratory and field.	**1**	**1**			**1**										**1**			
DY1 Semester 2	**Environmental Control and Design**																			
	1	Recognize the basic principles of human comfort in buildings.		**1**											**1**					
	2	demonstrate the principles of passive systems and green architecture.		**1**											**1**					
	3	prepare and apply measurements and provide detailed analysis of environmental factors in buildings.					**1**								**1**			**1**		
	4	Illustrate the importance of climate and its effect and impact on architectural design.																		
	5	Analyze thermal environment control strategies, solar radiation and sun path diagrams.																		

	6	Design of shading devices.																		
	7	Work as members of a project team.																		
	8	Manage workloads, and time effectively and in a self-directed manner.																		
	9	Develop mathematical skills appropriate to an architectural engineer.															**1**		
DY1 Semester 2		**Visual Design (2)**																		
	1	Identify shade and shadow casting principles.										**1**							
	2	Recognize different perspective types and drawing techniques; Subject-specific cognitive skills.										**1**							
	3	Apply shade and shadow casting principles to various drawing types.										**1**							
	4	Use principles of perspective drawing to produce perspectives for buildings.										**1**							
	5	Practice shade and shadow casting for various drawing types.										**1**							
	6	Practice perspective drawing of different buildings from different angles.										**1**							
	7	Communicate effectively with colleagues and tutors.						**1**	**1**										
DY2 Semester 1		**Architectural Design (2)**																		
	1	Recognize needs of different stakeholders (users, owners and community).				**1**					**1**									
	2	Explore arrangements of different spaces										**1**	**1**	**1**					
	3	Employ suitable structural system.										**1**	**1**	**1**					
	4	Assemble spaces of different sizes, shapes and uses into a coherent whole.										**1**	**1**	**1**					
	5	Design a medium size building.										**1**	**1**	**1**				**1**	
	6	Communicate ideas graphically (via sketches, drawings and renderings) and verbally.															**1**		
	7	Work as a member of a team																	**1**

DY2 Semester 1		**Architectural Design Principles**																		
	1	Recognize different types of design methods.								**1**										
	2	Describe design concepts and methods of evaluating and developing design approaches.								**1**										
	3	Define architectural design elements.								**1**										
	4	Apply strategic thinking.	**1**																	
	5	Explain contributing theories and methodologies for formulating architectural forms	**1**																	
	6	Criticize a design concept and different approaches.									**1**									
	7	Combine a suitable design approach and a strategic problem solving technique.									**1**									
	8	Analyse architectural designs according to form generating principals, design elements, spatial relation									**1**							**1**		
	9	Develop a determined and reasoned individual design approach.											**1**					**1**		
	10	Communicate effectively with colleagues and others								**1**										
DY2 Semester 1		**Building Construction (2)**																		
	1	Report different types of construction methods.	**1**																	
	2	Recognize different types of building materials.	**1**																	
	3	Determine the structural elements and construction sequence.			**1**	**1**														
	4	Determine basic technical principles of building systems.			**1**	**1**														
	5	Develop architectural detailed design to building construction elements in simple concrete framed structures.			**1**	**1**											**1**			
	6	Identify material and building systems.	**1**																	
	7	communicate effectively with colleagues and team members															**1**			

DY2 Semester 1	**Building Services**																			
	1	Define function and operation of building service systems.	**1**																	
	2	Identify technological aspects of buildings.	**1**																	
	3	Explain operational requirements and fixation of building service systems.	**1**																	
	4	Develop technical solutions for building services			**1**	**1**													**1**	
	5	Prepare assessment and measurement of building system performance and needs.			**1**	**1**											**1**			
	6	implement mathematical skills and solutions of Building services systems						**1**												
DY2 Semester 1	**Computer Applications in Architecture (1)**																			
	1	Identify various CAD concepts, and techniques to use them for producing 2D design drawings.		**1**																
	2	Develop procedures to produce various 2D CAD drawings				**1**														
	3	Apply appropriate computer-based methods to produce 2D architectural drawings of different degrees of difficulties.																	**1**	
	4	Identify shortcuts to speed up the drawing process using CAD systems.																	**1**	
	5	prepare various forms of 2D architectural CAD drawings																	**1**	
	6	Learn and work independently.																	**1**	
	7	use CAD to graphically communicate architectural design																	**1**	

DY2 Semester 1	**HistorY1 of Architecture (2)**																			
	1	identify the basic principles underlying in the analysis and design of structures.										**1**								
	2	recognize how structural and architectural design influence one another.										**1**								
	3	define the development of stress and strain in structural members										**1**								
	4	explain basic structural forms and their behaviour.					**1**					**1**								
	5	indicate the links between form, loads, deformations, internal actions and stresses.					**1**					**1**								
	6	Describe the relationship between structure and architectural form.					**1**					**1**								
	7	analyse and discuss structural forms and their relationship to architectural design							**1**											
	8	compare the behavior of simple beams, trusses, frames, arches and cables.							**1**											
	9	retrieve and analyse information from written and web-based sources; produce and present graphic/verbal descriptions of the above.								**1**										
DY2 Semester 2	**Architectural Design (3)**																			
	1	define spatial requirements of different building components.									**1**						**1**			
	2	Recognize needs of different building users.				**1**														
	3	develop spatial configuration alternatives in design..															**1**			
	4	Arrange multiple circulation networks.																		
	5	achieve good standards in design and competence in resolving comprehensive projects											**1**	**1**				**1**	**1**	**1**
	6	Develop ability to produce alternative solutions to design problems of moderate complexity									**1**						**1**			
	7	communicate design ideas via a range of media, including verbal and graphical presentations employing manual and electronic techniques																	**1**	

	8	cooperate effectively with colleagues and work as a member of a team																		1
DY2 Semester 2	**Building Construction (3)**																			
	1	Determine technological aspects of design and construction of precast framed buildings.	1																	
	2	Determine technological aspects of design and construction of steel framed buildings.	1																	
	3	Recognise health and safety issues.	1																	
	4	Determine movement, tolerances and fit.	1																	
	5	Interpret steel and precast framed buildings framed structures building process and detailing.			1	1														
	6	Analyse and evaluate documentations and time schedules during construction.			1	1											1			
	7	Recognise the site work.	1																	
	8	Illustrate rational decision making during the construction process.						1												
	9	Manage interdisciplinary groups.						1												
	10	Design verbal and written presentation.						1									1			
DY2 Semester 2	**Engineering Contracts& Quantity Surveying**																			
	1	Describe the nature, contributions and roles of the different players in the construction project.														1	1			
	2	Describe the different procurement approaches in the construction industry.														1	1			
	3	Explain the principles, components, parties' responsibilities of engineering contracts.						1												
	4	Outline tendering methods and procedures.				1		1												

	5	Identify procedures, advantages and disadvantages of the different engineering contracts.				**1**														
	6	Determine the factors that affect project cost.														**1**	**1**			
	7	Estimate the quantities of building materials in construction projects.	**1**																	
	8	Apply contract administration procedures.				**1**														
	9	Apply the Health and Safety procedures in construction contracts				**1**				**1**	**1**									
DY2 Semester 2	**Principles of Management for Architectural Engineers**																			
	1	Recall the nature of management				**1**		**1**									**1**			
	2	Define the evolution of schools of management														**1**				
	3	Recognize the managerial environment.														**1**	**1**			
	4	Practice the decision making and problem solving process						**1**			**1**						**1**			**1**
	5	Analyse organisational changes.									**1**									
	6	Identify the techniques of motivating and rewarding employees				**1**		**1**								**1**				
	7	Formulate productivity through total quality management				**1**										**1**				
	8	Integrate effective communication & interpersonal skills									**1**									
	9	Develop human resources														**1**				**1**
DY2 Semester 2	**Structural Drawings**																			
	1	define different components of light steel structures.	**1**	**1**													**1**			
	2	describe general lay out for different structural steel elements.	**1**	**1**													**1**			

	3	Identify different components of reinforced concrete structures such as slabs, beams, columns	1	1													1			
	4	select suitable construction materials in different buildings.	1	1													1			
	5	propose a suitable structural system for a certain application.	1	1													1			
	6	evaluate suitable empirical dimensions and sizing of all elements in question.	1	1													1			
	7	produce and interpret structural plans and section views for reinforced concrete and steel structures.	1	1													1			
	8	generate and interpret steel rebar detailing for reinforced concrete structure.	1	1													1			
	9	employ several empirical dimensioning and sizing for reinforced concrete and steel structures.	1	1													1			
DY2 Semester 2	**Theor1 of Architecture (1)**																			
	1	Define and introduces the invention of a new space based on the human body.					1			1		1								
	2	Outline the theories of renaissance, Baroque, Rococo architecture an finally steel and concrete as a new building material.					1			1		1								
	3	Analyze different buildings, structures and spaces and the influence of art on architecture.											1							
	4	Identify and discuss formal, technological, social and cultural and, political issues within the disciplines of architecture and design.											1							

	5	Develop the ability to understand different spatial and structural concepts from the Renaissance to the 19th century								1		1								
	6	Develop awareness for an innovative manner in solving different architectural and spatial								1		1								
	7	problems.					1			1		1	1							
	8	Communicate effectively with colleagues and team members.					1			1		1	1							
DY3 Semester 1	**Architectural Design (4)**																			
	1	Explain value-based team design decision-processes, concepts and principles				1												1	1	1
	2	Identify spatial and structure modelling and analysis				1												1		1
	3	Utilize group creativity and team dynamics				1							1	1	1			1		1
	4	Illustrate strategic value planning									1							1	1	1
	5	Compare function analysis									1									
	6	Generate scientific method early in the design process;									1									
	7	Employ team workshops within the design decision making process											1	1	1					
	8	Communicate effectively with colleagues and team members											1	1	1			1	1	1
	9	Correlate with design team											1	1	1					

DY3 Semester 1		**Geotechnical Engineering**																		
	1	Identify the different types of soil and rock commonly encountered during construction in Egypt and UK.	**1**	**1**																
	2	Explain the basic properties of soil and rock masses and how they are classified.	**1**	**1**																
	3	Assess the significance of commonly experienced construction ground-related problems.					**1**										**1**			
	4	Appraise potential construction problems from limited information on ground conditions.					**1**										**1**			
	5	Choose suitable methodologies for solution of ground problems.	**1**	**1**													**1**			
	6	Apply a range of methodologies for solution of ground problems.	**1**	**1**													**1**			
	7	Evaluate cost implications and risks associated with poor ground engineering.					**1**										**1**			
	8	Apply engineering skills to the solution of problems.					**1**										**1**			
DY3 Semester 1		**Project Management& Construction Economics**																		
	1	Discuss the construction project management principles and processes.				**1**											**1**			
	2	Identify the different stages of the project life cycle.				**1**		**1**									**1**			
	3	Explain the fundamentals of construction economics and cause of business failure in construction.				**1**											**1**			
	4	Apply project planning and scheduling skills to manage time of construction projects.						**1**								**1**				**1**
	5	Apply cost estimating, budgeting, forecasting and controlling techniques to manage costs of construction projects.						**1**								**1**				

	6	Analyse the economics systems for resource allocation and interpret market mechanism, theory of demand and supply, equilibrium and disequilibrium														**1**				**1**
	7	Employ quality management and risk management principles in construction projects.				**1**														
	8	Apply value management methods to design and construction projects, evaluate cost plans and evaluate effects of economic alternatives on project selection.				**1**										**1**				**1**
	9	Develop entrepreneurship skills for architects.									**1**									**1**
	10	Develop presentation skills and work effectively with colleagues and team members.																		**1**
DY3 Semester 1		**Theory of Architecture (2)**																		
		Define the dynamic relation between material, structure, space and style.					**1**			**1**		**1**								
	1	Outline the theories of modernism, structuralism, post- modernism, de-constructivism, hi-tech architecture and green technologies.					**1**			**1**		**1**								
	2	Analyse different buildings, structures and spaces of most state of the art building of the 20th century and beyond (from modernism to digital and blob architecture).								**1**			**1**							
	3	Identify and discuss formal, technological, social and cultural, political, and economic issues within the disciplines of architecture and design.								**1**			**1**							
	4	Develop the ability to understand different spatial and structural concepts concerning 20th and 21st century structures.					**1**			**1**			**1**							
	5	Develop awareness for an innovative manner in solving different architectural, structural and urban problems.					**1**			**1**			**1**							

	6	Communicate effectively with colleagues and team members.										**1**	**1**							
	7	Compare different concepts and ideas of history of design techniques and trends of the 20th & 21st century architecture.										**1**	**1**							
DY3 Semester 1		**Working Drawings (1)**																		
	1	Describe design methods, construction and management implications.			**1**														**1**	
	2	Identify working drawing systems.	**1**			**1**													**1**	
	3	Illustrate technical aspects and operational requirements of building systems.	**1**			**1**														
	4	Generate construction method statements.			**1**	**1**											**1**		**1**	
	5	Prepare working and workshop drawings.			**1**	**1**											**1**		**1**	
	6	Coordinate working and workshop drawings.			**1**												**1**		**1**	
	7	Communicate effectively with colleagues & team members.						**1**												
DY3 Semester 2		**Architectural Design (5)**																		
	1	Identify briefing, conceptual design and spatial configuration of high-rise buildings				**1**							**1**							
	2	Describe multiple circulation networks and spatial requirements											**1**							
	3	Develop an intellectual growth based on independent enquiry to a responsible understanding of the many contributing facets of high-rise architecture.									**1**		**1**	**1**	**1**					
	4	Distinguish between good standards in design and competence in resolving comprehensive high-rise projects.																**1**	**1**	**1**
	5	Develop an awareness of different structural systems and stability concepts.																	**1**	**1**
	6	effective usage and implementation of cross referencing for data relating to state-of-the-art Architectural profession and academic attributes.																**1**	**1**	**1**

	7	students will improve their communication and analytical skills and time-management skills via																**1**	**1**	**1**
DY3 Semester 2	**Computer Application in Architecture (2)**																			
	1	coordinate and manage the production and communication of information in the design and construction industry.				**1**													**1**	
	2	classify, acquire and model information flow				**1**													**1**	
	3	apply computer-based methods of information modeling		**1**															**1**	
	4	provide greater information management and communication in the range of information technology, media, and electronic data		**1**															**1**	
	5	use BIM applications to model buildings with information		**1**															**1**	
	6	Construct digital models of buildings with information		**1**															**1**	
DY3 Semester 2	**Interior Design (1)**																			
	1	Explain interior Design theory, techniques and methods.					**1**													
	2	Identify interior design theory of colours, materials and finishes.					**1**													
	3	Practice decision making process					**1**													
	4	Clarify the material selection process					**1**													
	5	Prepare interior construction and refurbishment schedules.					**1**							**1**					**1**	
	6	Apply implementation of interior refurbishment & repair strategies								**1**				**1**					**1**	
	7	Develop an appreciation for routine inspection, maintenance & repair								**1**				**1**					**1**	
	8	Communicate effectively with colleagues & team members								**1**										
	9	Express their ideas/proposals effectively to colleagues and others								**1**									**1**	

		Urban Planning																		
DY3 Semester 2	**1**	Recall the history of urban planning and contemporary issues with a special emphasis on the role of planners.					**1**											**1**		**1**
	2	Identify different types of urban planning theories, city growth and development and their relative limitations and regulations.					**1**											**1**		**1**
	3	Identify steps conducted and tools commonly used by professional urban planners and public administrators					**1**													
	4	Compare between the different planning processes and the role of the public and planners in each process.					**1**													
	5	Distinguish between different street levels and their design criteria.					**1**											**1**		**1**
	6	apply regulations of Land subdivision in urban development.										**1**	**1**	**1**						
	7	Conduct an urban and social survey.											**1**	**1**						
	8	Develop a strategic plan to a selected area in the city.											**1**	**1**				**1**		**1**
	9	Collect data and ideas from a range of sources.							**1**											
	10	Work effectively in a team.							**1**											

DY3 Semester 2		**Working Drawings (2)**																		
	1	Recognize technical aspects of design and construction of different buildings.	**1**																	
	2	Relate manufacturing, choice of material positioning and construction tolerances.	**1**																	
	3	Review the working drawing and detailed workshop drawing process and sheet linking systems.	**1**																	
	4	Describe common building materials and common construction processes, draw and specify standards and details.			**1**															
	5	Arrange drawing materials and techniques.			**1**			**1**									**1**		**1**	
	6	Develop manual and CAD skills through the production of working and workshop drawings.			**1**												**1**		**1**	
	7	Prepare a complete set of working drawings containing details and assembly drawings with list.				**1**											**1**		**1**	
	8	Coordinate working and workshop drawings.				**1**											**1**		**1**	
	9	Communicate effectively with colleagues & team members.						**1**											**1**	
DY4 Semester 1		**Urban Design**																		
	1	Discuss theories and concepts of urban design and contemporary issues with a special emphasis on the urban character.				**1**	**1**		**1**			**1**				**1**		**1**		
	2	Describe ways in which urban designs are generated, developed and assessed.			**1**	**1**					**1**				**1**		**1**			**1**
	3	Analyse data from primary and secondary sources to inform urban design process.		**1**		**1**	**1**					**1**	**1**		**1**		**1**	**1**		**1**
	4	Recognize and describe data to develop concept and scheme design proposals.			**1**		**1**		**1**		**1**		**1**	**1**		**1**		**1**		
	5	Develop an urban design proposal for an area.			**1**						**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**		
	6	Design and plan a field study for an urban design project.			**1**		**1**	**1**	**1**			**1**	**1**							**1**

	7	Produce professional presentation material both manually and using computer based programs.									**1**	**1**					**1**		**1**	**1**
	8	Work effectively within a group and communicate effectively with others.						**1**		**1**	**1**							**1**	**1**	**1**

DY4 Semester 1		**Architectural Design (6)**																		
	1	Describe the principles of high-tech building design within a cultural context.									**1**				**1**					
	2	Identify the role and duties of architects, planners, and engineering designers when approaching a cultural context.									**1**				**1**					
	4	Demonstrate competence in identifying and solving different of high-tech building design as related to the local culture and circulation problems.				**1**					**1**		**1**		**1**					
	5	Integrate with local building authorities.											**1**	**1**	**1**					
	6	Develop an awareness of procedures of special building regulations.												**1**	**1**					
	7	Demonstrate procurement and public relations and community participation skills.																**1**	**1**	**1**
	8	Communicate effectively with colleagues & team members.																**1**	**1**	**1**
DY4 Semester 1		**Built Environment and Human Behaviour**																		
	1	Recognize the complexity of the interrelationship between the built environment and human behaviour.					**1**			**1**	**1**	**1**	**1**	**1**					**1**	
	2	Identify user needs in the built environment.					**1**			**1**	**1**	**1**	**1**	**1**					**1**	
	3	Evaluate performance of occupied buildings.					**1**	**1**		**1**	**1**	**1**	**1**	**1**					**1**	**1**
	4	Deduce design responses to different user needs.					**1**			**1**	**1**	**1**	**1**	**1**				**1**	**1**	**1**
	5	Analyse data collected from different sources.					**1**	**1**		**1**	**1**	**1**							**1**	**1**

DY4 Semester 1		**Interior Design (2)**																		
	1	Recognize the theory and practice of modern interior design styles and techniques in the context of architectural space.					**1**												**1**	
	2	Distinguish interior design tools and techniques.					**1**												**1**	
	3	Develop detailed analysis of interior space of a specific building, chosen for the exemplary ways in which their designers engage with different topics and aspects.												**1**					**1**	
	4	Set up understanding concepts of interior design theory and practice.												**1**					**1**	
	5	Analyse interior and building space.												**1**					**1**	
	6	Develop sound architectural thinking.								**1**									**1**	
	7	Produce professional presentation material based on design/briefing information.								**1**										
	8	Express their ideas/proposals effectively to colleagues and others.								**1**										
DY4 Semester 1		**Geographic Information Systems**																		
	1	Structure and principles of geographic information systems (GIS).		**1**		**1**													**1**	
	2	Data acquisition, entry, query and analysis.		**1**		**1**													**1**	
	3	Spatial data visualization and analysis.		**1**		**1**													**1**	
	4	Synchronise and align all steps in spatial analysis using GIS software.		**1**		**1**													**1**	
	5	Apply GIS in a specific project.																**1**	**1**	
	6	Manage the interaction between different geographic information systems applications.																**1**	**1**	
	7	Communicate effectively with others.																**1**	**1**	

DY4 Semester 1		Human Resources Management in Construction and Architecture																		
	1	Explain the challenges of managing people in construction.				1		1								1	1			
	2	Recognize the development of modern organisational and management theory.				1		1									1			
	3	Discuss the different strategic concepts and operational implications of human resource management theories				1		1									1			
	4	Discuss the strategic approaches to managing human resources in the construction industry.				1		1			1					1	1			
	5	Identify the techniques and statistics applied to Human Resources Planning.				1										1	1			
	6	Explain the procedures of effective Human Resources Recruitment and Selection.						1								1	1			
	7	Design, implement and evaluate effective training programmes in design and construction firms.						1			1					1				
	8	Develop effective motivational systems in design and construction firms.				1		1			1					1	1			
	9	Manage employees with an emphasis on recruiting, selecting, training and motivating techniques.				1		1			1						1			
	10	Work independently and use Information and Communication Technology (ICT) to communicate and analyze complex issues systematically and creatively.				1		1			1						1			1

DY4 Semester 2	**Facilities Management in Building Life Cycle**																			
	1	Define the architectural projects life cycle.			1											1	1			
	2	Understand the main roles and responsibilities of FM.										1						1		
	3	Recognize Core Competencies of Facility Managers.												1				1		
	4	Analyse the current and future trends of facility management.	1			1														
	5	Practice the integration of FM management practice, project management, design management, space planning, and Building Information Modelling and real estate development.				1										1			1	
	6	Identify the techniques of integrating sustainability into FM.													1					
	7	Develop an ability to use the tools and techniques of the facility manager.																	1	
	8	Integrate effective communication & interpersonal skills.					1			1										1
DY4 Semester 2	**Housing**																			
	1	The principles of planning for Housing projects and contemporary issues with a special emphasis on the role of planners, zoning and law.				1												1		1
	2	Different types of urban development strategies for Housing projects.				1												1		1
	3	Analytical tools commonly used by professional urban planners and public administrators for Housing projects.					1													
	4	Design a survey form and data collection techniques.											1	1						
	5	Engage in fieldwork through a Housing planning studio.											1	1				1		1
	6	Develop planning skills, community needs awareness, Housing planning theories and acts.							1			1								
	7	Communicate effectively.							1											

DY4 Semester 2		**Architecture of Arid Environments**																		
	1	Constraints and parameters of Architectural design in Hot Arid Environments.									1				1			1		
	2	Climatic analysis of a site.					1				1				1			1		
	3	Using various traditional and innovative techniques to minimise heat transfer .					1				1				1			1		
	4	Integrate modern concepts of green architecture and climate responsive design					1				1				1			1		1
	5	Manage the interaction between different climatic factors and building design.					1				1				1			1		1
	6	Communicate effectively with others.																		1
DY4 Semester 2		**Computer Applications in Architecture (3)**																		
	1	Understand the impact of 3D CAD technology in digital design.	1	1																
	2	Explore the recent advances of 3D CAD technology in AEC projects.	1	1	1							1				1				
	3	Implement appropriate 3D CAD techniques to create, edit, render, and plot 3D drawings and models.										1								
	4	Think three-dimensionally to create different ideas, Forms and views from a range of 3D modelling and rendering techniques.			1											1				
	5	Build, Produce, edit, Modify, and render complex architectural 3D models.										1		1		1				
	6	Create and present advanced rendered architectural, urban design, using an appropriate Modelling and Rendering software.														1				1
	7	Use a variety of 3D CAD presentation packages.															1			
	8	Use of appropriate rendering methods according to the available software.								1										

DY4 Semester 2		**Environmental Simulation**																		
	1	Choose appropriate passive technique to reduce energy consumption Identify the different stages of the project life cycle.	1	1	1	1	1				1					1	1	1		1
	2	Interpret output from environmental simulation applications;	1	1	1	1	1	1			1		1			1	1			
	3	Determine the impact of different design decisions on energy consumption and thermal comfort;	1	1	1	1	1					1	1	1	1			1		1
	4	Critically assess output from environmental simulation applications;		1			1			1				1						
	5	Combine different treatments to optimize thermal performance of buildings	1	1	1	1	1				1	1	1							1
	6	Use a variety of modelling and simulation packages.				1	1			1	1	1								1
DY4 Semester 2		**Environmental Impact Assessment**																		
	1	Explain the theory and practice of modern EIA and techniques.					1													
	2	Identify EIA methodologies and tools.					1													
	3	Provide detailed analysis of a specific project and its impact on the environment.		1																
	4	Record data collection and analysis of project impacts on the surrounding environment.		1																
	5	Develop sound environmental impact analysis.		1											1			1		
	6	Use professional report writing skills to communicate effectively with colleagues and others.					1													
DY4 Semester 2		**Lean Construction**																		
	1	Explain the nature and characteristics of the construction industry.	1			1										1	1			
	2	Discuss Lean Principles Theory.				1										1	1			
	3	Recognize Lean Principles application in construction.				1										1	1			1
	4	Explain the tools and techniques of Lean Process Management.	1			1		1												

	5	Identify the potentials and constraints of Lean Construction application in construction.	**1**													**1**	**1**			
	6	Apply Lean Construction principles in the design and construction processes.	**1**			**1**		**1**								**1**	**1**			
	7	Create reliable work flow, reduce waste, and promote process transparency.									**1**					**1**				
	8	Lead and motivate individuals to facilitate adopting Lean principles in the construction industry.							**1**	**1**	**1**									
	9	Work independently and use Information and Communication Technology (ICT) to communicate and analyze complex issues systematically and creatively.							**1**	**1**	**1**									
DY4 Semester 2		**Landscape Architecture**																		
	1	Recall the elements of landscape architectural design.				**1**	**1**													
	2	Recognize the functional, aesthetic, social and environmental sustainable aspects of landscape architectural design.			**1**	**1**			**1**				**1**	**1**				**1**		
	3	Analyse information from primary and secondary sources to inform design development and prepare the proposed BOQ.						**1**									**1**		**1**	
	4	Interpret information to develop conceptual and schematic design proposals.			**1**			**1**							**1**	**1**	**1**			**1**
	5	Choose relevant sources of information for analysis and appraisal.					**1**					**1**								**1**
	6	Produce professional concept designs and proposals.						**1**			**1**		**1**			**1**			**1**	
	7	Produce professional presentation material based on design/briefing information.								**1**	**1**	**1**							**1**	
	8	Work effectively within a group and communicate effectively with others.							**1**	**1**									**1**	**1**

DY4 Semester 1 & 2		**Research Dissertation [1:1]**																		
	1	Identify key issues of a specific topic.									**1**									
	2	Discuss and debate different types of information, including ideas, data, concepts, and theories.									**1**									
	3	Define a research problem and state an aim and objectives related to the research problem.					**1**													
	4	Applying appropriate research methodology while investigate research problems.					**1**													
	5	Learn and work independently.								**1**										
	6	Collect data and evaluate concepts from a range of sources										**1**								
	7	Write a discursive essay assembling and structuring ideas from a variety of source																		
	8	Deliver a short presentation to discuss and explain arguments.																		
DY4 Semester 1 & 2		**BSc. Design Project [1:2]**																		
	1	Identify the role of architectural design as continues and interrelated process.				**1**														
	2	Recall previously acquired principles and their implications on the design project.									**1**		**1**	**1**	**1**			**1**	**1**	**1**
	3	Prepare a design brief from limited material information.				**1**														
	4	Produce design options to comply with the design brief and all applicable codes and/or standards.									**1**		**1**	**1**	**1**			**1**	**1**	**1**
	5	Recognize and evaluate various design options and case studies.									**1**		**1**	**1**	**1**			**1**	**1**	**1**
	6	Revise knowledge from different areas of engineering and apply them to create a final applicable project proposal.				**1**														
	7	Design and create a detailed architectural project.									**1**		**1**	**1**	**1**			**1**	**1**	**1**
	8	Generate and evaluate data from various sources and apply it to a problem.									**1**		**1**	**1**	**1**			**1**	**1**	**1**

	9	Produce professional reports, drawings and presentations as appropriate.				**1**														
	10	Show and demonstrate time management and presentation skills									**1**		**1**	**1**	**1**			**1**	**1**	**1**

14. Modules vs. Assessment Types (Weight %)

Semester	Module Title	Module code	Assessment Types (Adjust/add as appropriate to the programme) %																		
			Group presentation	Group report	Group project	Class Test 1	Individual report	Individual presentation	Individual project	Individual portfolio (1)	Individual portfolio (2)	Individual One week Project	Practical Assessment	Oral Assessment	Design Brief (Supervisor)	Lab Report	Interim Report (Panel)	Student's Efforts (Supervisor)	Final Submission (Panel)	VIVA (Panel)	Unseen Exam
DY1 Semester 1	Architectural Drawing & Design Applications	ARC H07C								40 %	30 %	30 %									
	History of Architecture (1)	ARC H06C				30 %				30 %											40 %
	Introduction to Construction Methods	ARC H18C			30 %	30 %															40 %
	Introduction to Structural Analysis	ARC H01C			10 %	30 %															60 %
	Visual Design (1)	ARC H15C			20 %					20 %	20 %										40 %
	Technical Writing for Architects	ARC H17C	20 %	20 %	20 %																40 %
DY1 Semester 2	Architectural Design (1)	ARC H16C	20 %						50 %			30 %									
	Surveying for Architectural Engineers	ARC H19C				20 %	20 %														60 %

	Building Construction(1)	ARC H09C	20 %							20 %	20 %										40 %
	Construction Materials	ARC H02C	20 %			20 %															60 %
	Environmental Control and Design	ARC H08C		25 %				35 %													40 %
	Visual Design (2)	ARC H13C								40 %	40 %	20 %									
DY2 Semester 1	Architectural Design (2)	ARC H102I	20 %						50 %			30 %									
	Architectural Design Principles	ARC H03I			20 %				40 %												40 %
	Building Construction (2)	ARC H11C			20 %					25 %	15 %										40 %
	Building Services	ARC H06I		30 %						30 %											40 %
	Computer Applications in Architecture (1)	ARC H14C				30 %			40 %	30 %											
	History of Architecture (2)	ARC H07I	10 %	20 %						30 %											40 %
DY2 Semester 2	Architectural Design (3)	ARC H08I		20 %					30 %		20 %	30 %									
	Building Construction (3)	ARC H05I	5 %	10 %						25 %	20 %										40 %
	Engineering Contracts& Quantity Surveying	ARC H01I			20 %	20 %															60 %
	Principles of Management for Architectural Engineers	ARC H12C			20 %	20 %															60 %
	Structural Drawings	ARC H05C				20 %				15 %	15 %										50 %

	Theory of Architecture (1)	ARC H10I			30 %				30 %												40 %
DY3 Semester 1	Architectural Design (4)	ARC H11I			20 %				50 %			30 %									
	Geotechnical Engineering	ARC H12I			20 %	20 %															60 %
	Project Management& Construction Economics	ARC H16I	20 %			20 %															60 %
	Theory of Architecture (2)	ARC H18H	20 %						30 %												50 %
	Working Drawings (1)	ARC H14I	10 %	20 %						25 %	25 %			20 %							
DY3 Semester 2	Architectural Design (5)	ARC H03H			20 %				50 %			30 %									
	Computer Application in Architecture (2)	ARC H09I				50 %			25 %	25 %											
	Interior Design (1)	ARC H13I			35 %				35 %			30 %									
	Urban Planning	ARC H17I			60 %																40 %
	Working Drawings (2)	ARC H13H	10 %	20 %						25 %	25 %			20 %							
DY4 Semester 1	Architectural Design (6)	ARC H07H					15 %		50 %			35 %									
	BSc. Design Project [1:2]	ARC H25H													20 %			10 %			
	Research Dissertation [1:1]	ARC H06H															20 %	20 %	50 %	10 %	
	Urban Design	ARC H05H			50 %																50 %
	Built Environment & Human Behaviour	ARC H19H				30 %	30 %														40 %

	Geographic Information Systems	ARC H20H			25%				25%												50%
	Human Resources Management in Construction and Architecture	ARC H09H					20%	20%													60%
	Interior Design (2)	ARC H15H			35%				35%			30%									
DY4 Semester 2	BSc. Design Project [1:2]	ARC H25H																10%	50%	10%	
	Research Dissertation [1:1]	ARC H06H															20%	20%	50%	10%	
	Landscape Architecture	ARC H14H			25%				25%												50%
	Architecture of Arid Environments	ARC H17H			50%																50%
	Computer Application in Architecture (3)	ARC H08H				50%			25%	25%											
	Environmental Impact Assessment	ARC H16H		20%			20%														60%
	Environmental Simulation	ARC HH							50%	50%											
	Facility Management in Building Life Cycle	ARC H22H					25%		15%												60%
	Housing	ARC H23H			45%				25%												30%
	Lean Construction	ARC H11H					20%	20%													60%

15. Module Aims VS Programme Aims

Module Aims vs. Programme Aims									
Semester	Module Aims			Programme Aims					
	#	Modules	Code	To Prepare distinguished graduate able to compete.	To achieve excellence in teaching and learning.	To achieve excellence in scientific research.	To expand the role of the programme towards serving the community.	To develop the programme's Human Resources.	To enhance the programme supporting infrastructure
DY1 Semester 1		Architectural Drawing & Design Applications	ARCH07C						
	1	The aim(s) of this module is to develop knowledge, understanding, and practice of using manual drafting techniques for producing various architectural design drawings, representations, and models.		**1**	**1**				
DY1 Semester 1		History of Architecture (1)	ARCH06C						
	1	The aim of this module is to develop knowledge and understanding of the history of architecture and the key spatial, functional and aesthetic elements of the historic built form.		**1**	**1**				
DY1 Semester 1		Introduction to Construction Methods	ARCH18C						
	1	Introduce the technological aspects, construction sequence of framed and unframed buildings to the students; and Emphasize on the basic architectural and structural components, materials, subsystems and their functions.		**1**			**1**		

DY1 Semester 1	Introduction to Structural Analysis		ARCH01C						
	1	The aim of this module is for architectural engineering students to understand the principles of structural analysis and to appreciate how this is related to architectural forms.		1					
DY1 Semester 1	Visual Design (1)		ARCH15C						
	1	The aim of this module is to engage students in art production and discussion of aesthetics, , To enhance their abilities in graphic communication and presentation skills To enhance their abilities in application of colour theory in design.			1				
DY1 Semester 1	Technical Writing for Architects		ARCH17C						
	1	to provide the student with skills in assimilation of information pertinent to the architectural profession available from technical documents such as drawing, specifications, regulations, and technical reports This module intends to improve the students experience in technical routines. this module supports students to communicate their findings in writing and through graphical means.		1	1	1			

	Architectural Design (1)								
DY1 Semester 2	1	The aims of this module are to: Present a thorough grounding of the Egyptian building law. Provide solutions to simple architecture problems taking into consideration environmental requirements and landscaping. Formulate a design brief, functional requirements and spatial requirements.	**ARCH16C**	**1**	**1**		**1**		
	Surveying for Architectural Engineers								
DY1 Semester 2	1	Obtain an understanding of surveying instrumentation together with observation techniques and limitations, and also for the students to acquire the practical skills necessary to use maps in setting out planned structures in the field.	**ARCH19C**	**1**					
	Building Construction (1)								
DY1 Semester 2	1	To present the building production process for framed and unframed buildings. To introduce the student to professional development and lifelong learning; To introduce the students to the basics of technical drawings.	**ARCH09C**	**1**	**1**		**1**		**1**
	Construction Materials								
DY1 Semester 2	1	The aim of this module is to provide students with an understanding of the nature of common construction materials, their constituents, and properties and how they are used in engineering applications and to show how this knowledge is applied to design.	**ARCH02C**	**1**		**1**			

DY1 Semester 2	Environmental Control and Design		ARCH08C						
	1	The aim(s) of this module is to introduce students to the basic principles and theories used and applied to the Environmental Control and Design of buildings.		**1**	**1**				
DY1 Semester 2	Visual Design (2)		ARCH08C						
	1	The aim of this module is to provide the students with the knowledge and skills necessary for shade and shadows casting, and perspectives drawing, as necessary tools of architectural representation and graphic communication.		**1**					
DY2 Semester 1	Architectural Design (2)		ARCH02I						
	1	Provide understanding of the relationship between different building components. Resolution of structural issues, functional requirements, and form generation in low-rise buildings.		**1**	**1**	**1**	**1**		
DY2 Semester 1	Architectural Design Principles		ARCH03I						
	1	The aim of this module is to present architectural design methods; and Provide in-depth knowledge of architectural design elements and their inter-relations.		**1**	**1**				
DY2 Semester 1	Building Construction (2)		ARCH11C						
	1	Introduce the principles and techniques of building construction, building materials and building. systems; and Introduce construction methods.		**1**	**1**				

DY2 Semester 1		Building Services	ARCH06I						
	1	The aim of this module is to present technological aspects, function and operation of building service systems.		1	1		1		
DY2 Semester 1		Computer Applications in Architecture (1)	ARCH14C						
	1	The aim of this module is to develop students' skills of using 2D computer aided drafting technology to produce quality 2D Architectural design drawings		1					
DY2 Semester 1		History of Architecture (2)	ARCH07I						
	1	The aim of this module is to introduce the architecture of the Islamic Civilization as it developed throughout the ages and in the different regions and to ground the students in the architectural concepts used the design of building types.			1	1	1		
DY2 Semester 2		Architectural Design (3)	ARCH08I						
	1	The aim of this module is to develop architectural design capabilities related to spatial configuration of several repetitive elements, while maintaining functional and structural requirements.		1	1	1	1		
DY2 Semester 2		Building Construction (3)	ARCH05I						
	1	The aim of this module is to introduce the technological aspects of the design and construction of steel and precast framed buildings.		1		1	1		1

DY2 Semester 2	Engineering Contracts& Quantity Surveying		ARCH01I						
	1	This module aims to provide an understanding of the principles and procedures of engineering contracts, tendering, and estimating building materials quantities.		1	1		1	1	
DY2 Semester 2	Principles of Management for Architectural Engineers		ARCH12C						
	1	The aim of this module is to introduce the fundamental principles of management with particular emphasis on the construction industry.		1	1	1	1		
DY2 Semester 2	Structural Drawings		ARCH05C						
	1	The aim of this module is the introduction of basic structural elements and systems employed in the construction of different structural steel and reinforced concrete buildings.		1					
DY2 Semester 2	Theory of Architecture (1)		ARCH10I						
	1	Introduce students to the theories and philosophies of 14th century to 19th century architecture. The concept of the human body as a deriving force in design. Presents the influence of art on architecture. Identify and describe different architectural styles and buildings. Present different phases of steel as a new building material versus reinforced concrete		1	1	1			

DY3 Semester 1		Architectural Design (4)	ARCH11I						
	1	Gain an understanding of the methods for challenging construction designs and processes by innovative solutions; Apply these solutions into an architectural design problem for complex large span buildings with functional spatial requirements.		1		1	1		1
DY3 Semester 1		Geotechnical Engineering	ARCH12I						
	1	The aim of this module is to illustrate the influence of ground conditions on the design and construction processes, and to have an understanding of engineering solutions that can be applied to typical geotechnical problems.			1	1			
DY3 Semester 1		Working Drawings (1)	ARCH14I						
	1	The aim of this module is to introduce students to advanced detailed execution drawings, and workshop detailing.		1	1		1	1	1
DY3 Semester 1		Project Management and Construction Economics	ARCH16I						
	1	The aim of this module is to provide students with an understanding of principles, tools and techniques of project management and construction economics.		1	1	1	1	1	

DY3 Semester 1	Theory of Architecture (2)		ARCH33H						
	1	The aim of this module is to Introduce students to the theories and philosophies of 20th and 21st century architecture, present different space concepts in relation to the dialects between structure and materials, identify and describe different architectural styles from all regions of the world from modernism to the theory displacement and blob architecture, and to identify different case studies within and beyond the parameters of Modernism.		1	1	1			
DY3 Semester 2	Architectural Design (5)		22ARCH03H						
	1	The aims of this module are to: Present students with the process within which high-rise buildings are conceived and designed, from briefing to concept design stage. Apply this knowledge in a conceptual building design project;		1		1	1		1
DY3 Semester 2	Computer Applications in Architecture (2)		22ARCH09I						
	1	The aim(s) of this module is to introduce students to Building Information Modelling (BIM). Emphasis is on their development and applications within design and construction practices.		1	1		1		1
DY3 Semester 2	Working Drawings (2)		22ARCH13H						
	1	The aim of this module is to: Prepare students to be able to complete a set of workshop drawings required to build a preliminary construction project.		1	1		1	1	1

DY3 Semester 2	Interior Design (1)		22ARCH13H						
	1	The aim(s) of this module is to prepare students to be able to: Present the theories and concepts of Interior Design of architectural spaces; and Present strategies and techniques used in converting and refurbishing buildings		1			1		1
DY3 Semester 2	Urban Planning		22ARCH17I						
	1	The aim of this module is to introduce students to the principles, processes, and practices of urban planning, illustrate context and objectives of urban planning and urban development; and present different urban development strategies.		1	1	1	1		
DY4 Semester 1	URBAN DESIGN		22ARCH05H						
	1	The aim of this module is for students to understand the process within which urban context are conceived and designed, from appraisal of existing urban character to scheme design stage and to apply this knowledge in an urban design project.		1	1	1	1		
DY4 Semester 1	Architectural Design (6)		22ARCH07H						
	1	The aim of this module is to present the principles of design of high-tech buildings within a context with cultural significance.		1		1	1		1

DY4 Semester 1	Human Resource Management in Construction &Architecture		22ARCH09H						
	1	The aim of this module is to present students with the range of techniques and strategies for managing people within the context of the construction project environment.		**1**	**1**	**1**	**1**	**1**	
DY4 Semester 1	Interior Design (2)		22ARCH15H						
	1	The aim of this module is to develop knowledge and understanding of the key spatial, functional and aesthetic elements of interior design of architectural spaces.		**1**			**1**		**1**
DY4 Semester 1	Built Environment and Human Behaviour		22ARCH19H						
	1	The aim of this module is: To develop students' understanding of the mutual relationship between the Built environment and human behaviour. To provide students with the tools necessary to investigate users' interaction with the built environment, in order to design built environments that better suit their users.		**1**	**1**	**1**	**1**		**1**
DY4 Semester 1	Geographic Information System		22ARCH20H						
	1	The aims of the module are to provide a broad introduction to the basic concepts of Geographical Information Systems (GIS) including technical, data-related, and organizational issues, and to develop a critical appreciation of the impact of GIS on the planning		**1**	**1**		**1**		**1**

		profession and society at large, and help the student work independently with various types of geographical data in GIS.							
DY4 Semester 2	Landscape architecture		22ARCH14H						
	1	The aims of this module are to understand the context and the process within which landscape environments are conceived and designed, from concept to scheme design stage and to apply this knowledge in a conceptual landscape design project.		1	1	1	1		
DY4 Semester 2	Architecture of Arid Environments		22ARCH17H						
	1	The aim of this module is to Provide a broad introduction to the concepts of architectural design in hot arid environments and the way a building form and structure moderates the climate for human comfort; and introduce both passive and mechanical methods (and the combination of both) to achieve human comfort in arid environments; however the emphasis on understanding both established and innovative approaches to passive design methods in hot arid environments.		1	1	1	1		
DY4 Semester 2	Facilities Management in Building Life Cycle		22ARCH22H						
	1	The aim of this module is to introduce the fundamental principles of Facilities Management, its roles, responsibilities and how it could be integrated with other processes		1	1	1	1	1	

		throughout the life cycle of the building							
DY4 Semester 2	Computer Application in Architecture (3)		22ARCH08H						
	1	To develop students' understanding of 3D computer aided design procedures and command structures using modelling applications, for architectural, engineering and construction professions (AEC); To provide students with the ability to evaluate and apply 3D modelling, editing and rendering techniques in architectural, engineering and construction projects. To provide students with full understanding of new rendering techniques. To provide students with introduction to Digital Fabrication for Architecture		1	1		1		1
DY4 Semester 2	Environmental Impact Assessment		22ARCH17H						
	1	The aim of this module is to develop knowledge and understanding of the key concepts, theories, methodologies, and techniques of conducting Environmental Impact Assessment (EIA) of a specific project.		1	1	1	1		
DY4 Semester 2	Environmental Simulation		22ARCH21H						
	1	The aim of this module is: to develop students' understanding of building thermal performance and approaches of reducing energy consumption and attaining thermal comfort.		1	1		1		1

		to provide students with the ability to estimate thermal performance and energy consumption of different design decisions, and to optimize building thermal performance							
DY4 Semester 2	Lean Construction		22ARCH11H						
	1	The aim of this module is to introduce students to the principles, tools and techniques of Lean Construction in the construction industry.		1	1	1	1		
DY4 Semester 2	Housing		22ARCH23H						
	1	The aim of this module is to: Qualify the student for evaluating city history, evolution, elements, development and components including cityscape and landscape. Differentiate between levels and theories of urban planning and design. Understand and identify sociological and cultural urban demographic, political, ethnic issues of urban built environment. Conduct field survey and data gathering from different sources. Finally diagnose urban problems. Scrutinize economic, social and environmental issue faced especially by planners for Housing projects. Present the principles, processes, and practices of planning for Housing projects.		1	1		1	1	

DY4 Full Year	Research Dissertation [1:1]		22ARCH06H						
	1	The aims of this module are to provide students with the knowledge and skills necessary to systematically investigate research problems, and to write up a research dissertation on topics related to architecture and the built environment utilizing processes and methodologies of scientific enquiry		1	1	1	1		
DY4 Full Year	BSc. Design Project [1:2]		22ARCH25H						
	1	To apply the gained skills during previous design modules to program and design a relatively complex project of their choice from preparation of the brief to detailed design drawings.		1	1		1		1

16. Mapping Matrix of programme competencies vs. QAA Benchmarks Statements

Programme Competencies		UK QAA - Benchmark Statements QAA subject benchmark statement: Architecture UK STANDARD FOR PROFESSIONAL ENGINEERING COMPETENCE	
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. the practical applications of these underlying principles to architectural engineering and construction technology.	GC8	Understanding of the structural design, constructional and engineering problems associated with building design
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	QD1.8	critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgements, and to frame appropriate questions to achieve a solution - or identify a range of solutions - to a problem
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	GC6	Understanding of the profession of architecture and the role of the architect in society, in particular in preparing briefs that take account of social factors
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	GC9	Adequate knowledge of physical problems and technologies and the function of buildings so as to provide them with internal conditions of comfort and protection against the climate
A5	Practice research techniques and methods of investigation as an inherent part of learning.	QD1.3	to devise and sustain arguments, and/or to solve problems, using ideas and techniques, some of which are at the forefront of the discipline

Programme Competencies		UK QAA - Benchmark Statements QAA subject benchmark statement: Architecture UK STANDARD FOR PROFESSIONAL ENGINEERING COMPETENCE	
		QD1.4	to describe and comment upon particular aspects of current research, or equivalent advanced scholarship, in architecture
		QD1.6	the ability to manage their own learning, and to make use of scholarly reviews and primary sources (for example, refereed research articles and/or original materials appropriate to architecture).
		QD1.8	critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgements, and to frame appropriate questions to achieve a solution - or identify a range of solutions - to a problem
A6	Plan, supervise and monitor implementation of engineering projects.	QD1.7	apply the methods and techniques that they have learned to review, consolidate, extend and apply their knowledge and understanding, and to initiate and carry out projects
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.		
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	QD1.9	communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	QD1.10	the qualities and transferable skills necessary for employment requiring: - the exercise of initiative and personal responsibility - decision-making in complex and unpredictable contexts - the learning ability needed to undertake appropriate further training of a professional or equivalent nature
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.		

Programme Competencies		UK QAA - Benchmark Statements QAA subject benchmark statement: Architecture UK STANDARD FOR PROFESSIONAL ENGINEERING COMPETENCE	
B1	Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies and human sciences.	GC1	Ability to create architectural designs that satisfy both aesthetic and technical requirements
		GC2	Adequate knowledge of the histories and theories of architecture and the related arts, technologies and human sciences
		GC3	Knowledge of the fine arts as an influence on the quality of architectural design
		GC4	Adequate knowledge of urban design, planning and the skills involved in the planning process
		QD1.1	a systematic understanding of key aspects of architecture, including acquisition of coherent and detailed knowledge, at least some of which is at, or informed by, the forefront of the discipline
B2	Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	GC5	Understanding of the relationship between people and buildings, and between buildings and their environment, and the need to relate buildings and the spaces between them to human needs and scale
		GC10	The necessary design skills to meet building users' requirements within the constraints imposed by cost factors and building regulations

B3	Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of structural design, construction, technology and engineering problems associated with building designs.	GC8	Understanding of the structural design, constructional and engineering problems associated with building design
		GC9	Adequate knowledge of physical problems and technologies and the function of buildings so as to provide them with internal conditions of comfort and protection against the climate
B4	Transform design concepts into buildings and integrate plans into overall planning within the constraints of project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	GC11	Adequate knowledge of the industries, organisations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning
B5	Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	GC6	Understanding of the profession of architecture and the role of the architect in society, in particular in preparing briefs that take account of social factors
C1	C-ar1. Develop a commitment to professional standards on a personal level, recognize obligations to society, profession and the environment through exercising design practices that show responsibilities in an ethical manner.	GC4	Adequate knowledge of urban design, planning and the skills involved in the planning process
C2	Use information and communication technology (ICT) to communicate and analyse complex issues in a systematic and creative manner, while employing communication methods and conclusions that are clear and effective in written, oral, and graphical formats.	QD1.2	an ability to deploy accurately established techniques of analysis and enquiry within architecture
		GC9	Adequate knowledge of physical problems and technologies and the function of buildings so as to provide them with internal conditions of comfort and protection against the climate
C3	Implement the necessary steps through planning a design or research project using problem solving skills in an innovative	GC7	Understanding of the methods of investigation and preparation of the brief for a design project

	manner either individually or as a team member while managing workloads, limited resources of information, money, and time effectively and in a self-directed manner	QD1.5	an appreciation of the uncertainty, ambiguity and limits of knowledge
		QD1.7	apply the methods and techniques that they have learned to review, consolidate, extend and apply their knowledge and understanding, and to initiate and carry out projects

مواصفات برنامج الهندسة الكيميائية

Programme Specification Chemical Engineering Programme

The Chemical Engineering programme provides students with unique way of thinking and creativity globally through integrating chemistry with physics and economics to investigate systematically industrial processes of chemical production. Also, it provides students with skills for designing new processes, equipment and integrating between various processes to reduce cost, energy consumption and provide green processes for environment. Students are graduates with a distinctive degree of Bachelor of Science in chemical Engineering specialized either in petrochemical engineering or environmental engineering through four years of study.

Chemical engineers develop strong synthetic and analytic skills. Through creative application of these chemical engineering principles, chemical engineers create innovative solutions to important industrial and societal problems in areas such as development of clean energy sources, advancement of life sciences, production of pharmaceuticals, sustainable systems and responsible environmental stewardship, and discovery and production of new materials.

This combination of a programme based on a learning culture fostering key and transferable skill sets, in addition to technical ones, together with academic and professional accreditation, makes our programme in Chemical Engineering quite unique in both Egypt and the surrounding region.

1. Basic Information

1	**Programme title**	**Chemical Engineering**
2	**Name of the final award**	**BSc with honours [validated by UK partner]**
3	**Awarding body/institution**	**The British University in Egypt**
4	**Faculty**	**Engineering**
5	**Department**	**Chemical**
6	**Dean (HoD)**	**Prof. Maguid Hassan**
7	**Head of Department (HOD)**	**Prof. Shahir Sadek**
8	**Programme Director (PD)**	**Assoc. Prof. Hany El- Azab**
9	**Professional, Statutory and Regulatory Body Accreditation**	**Egyptian Engineering Syndicate**
10	**Date of last internal review and updates**	**March 2017**
11	**Approval Date to adopt NARS 2018 by:** - **Departmental Council** - **Faculty Council**	- **5 September 2020** - **13 October 2020**

2. Mission

The Chemical Engineering Department has developed the mission, and educational objectives for each of its programme through well-established procedures. The mission statements of the Chemical Engineering Department are to be considered among the top chemical engineering departments in the Middle East, which is able to attract leading faculty producing graduates who are internationally recognised. Our mission is to provide students with a quality Chemical Engineering education, provide services, and carry out basic and applied research.

3. Programme Aims

The aims of this programme are to:

1. Prepare graduates who are skilled chemical and process engineers who serve as professional role models for the next generations.
2. Prepare graduates who take part in the development of the country's chemical and process industries and are able to work abroad.
3. Prepare graduates who develop themselves professionally or pursue their graduate studies.
4. Prepare graduates who apply principles of mathematics, chemistry, and chemical engineering to the design and safe-operation of economically feasible and environmentally performing chemical and petroleum processing systems.

4. Distinctive features of the programme

The BUE delivers programmes based on a British philosophy of education. This results in programmes that are very much focused on the student rather than those who deliver the material. Graduates from UK programmes typically exhibit:

- the ability to think creatively and with strong problem solving skills;
- high level key and transferable skill sets;
- the ability to maintain independently a high level of professional and subject specific competence (often through CPD);
- technical competence;
- the ability to conceptualise problems at a high level (i.e. to see the big picture);
- diligent and ethical working practices;
- the ability to work both independently and as part of a team;
- flexibility and the ability to apply their subject specific knowledge to fields outside their own;
- the ability to face any new professional or academic challenge and use available resources to create innovative solutions.

Furthermore, this programme is delivered both with a local and UK flavour giving students the opportunity to gain an appreciation of national and international perspectives on many aspects of professional life. This includes management techniques, business culture, legal frameworks and standards.

The BUE Mission is to be the leading provider of high quality UK style education in the MENA region. The University is committed to ensuring UK validation of its programmes and to ensure a student experience that is in line with UK standards. Built on top of institutional quality assurance is subject level validation and the Faculty is committed to ensuring that its UK validating partners confirm that its degree programme is in line with UK standards. An indicator of this will be the dual award of both an Egyptian BSc and a BEng in Chemical Engineering from the UK validating partner.

Accredited degree programmes are the preferred and fast track routes for those who aim to obtain the professional qualification of Chartered Engineer (CEng). For a brief overview on the Chartered Engineering qualification and why it is important please see: http://www.iee.org/ProfessionalRegistration/CEng/

At the time of writing, and to the best of our knowledge, this combination of a programme based on a learning culture fostering key and transferable skill sets, in addition to technical ones, together with academic and professional accreditation, makes our programme in Chemical Engineering quite unique in both Egypt and the surrounding region.

5. Relevant subject benchmark statements and other external and internal reference points used to inform programme outcomes

To ensure that the programme complies with the requirements of relevant national and international AE professional institutions/bodies, and to qualify graduates to apply for memberships in respective institutions and/or gain Chartered Engineer status, the following are used as reference points to inform the programme outcomes:

- Part A: Setting and Maintaining Academic Standards PART A:The Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies October 2014 www.qaa.ac.uk/en/Publications/.../qualifications-frameworks.pdf
- QAA Subject Benchmark Statements: Engineering, February 2015 http://www.qaa.ac.uk/publications/information-and guidance/publication?PubID=2910#.VzGeXU9jQ-8
- Engineering Council Accreditation of Higher Education Programmes: UK Standard for Professional Engineering Competence - UK SPEC 3rd Edition - http://www.engc.org.uk/UKSPEC
- IChemE especially the "IChemE accreditation guide, pdf." (Accreditation of chemical engineering degrees, a guide for university departments and assessments based on learning outcomes. available at *http://www.IchemE.org.uk/*
- National Authority for Quality Assurance and Accreditation of Education (NAQAAE), NARS Statements - Engineering http://naqaae.eg/
- SEEC(2016). Credit Level Descriptors for Higher Education. Southern England Consortium for Credit Accumulation and Transfer www.seec.org.uk
- The Chemical programme originally adopted NARS 2009 and upon the issuing of national Academic Reference Standards (NARS 2018 for Engineering 2nd edition), the programme performed a gap analysis with additional action plan to bridge all gaps if any. Hence, the programme specification is updated to comply with National Academic Reference Standards (NARS 2018) developed by The National Authority of Quality Assurance and Accreditation of Education (NAQAAE), https://admin.naqaae.eg/api/v1/archive/download/34733)

6. Graduate Attributes

The creative way of approaching all engineering challenges is being seen increasingly as a 'way of thinking' which is generic across all disciplines. The Chemical Engineering Programme adopted the NARS 2018 attributes for Engineering and Chemical Engineering. The graduates of Chemical engineering should have the ability to:

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.

2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.
3. Behave professionally and adhere to engineering ethics and standards.
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.
7. Use techniques, skills, and modern engineering tools necessary for engineering practice.
8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.
9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.

In addition to the general attributes of engineer, the chemical engineer must be able to:

i. Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.
ii. Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.
iii. Apply numerical modelling methods and/or computational techniques appropriate to chemical engineering.
iv. Adopt suitable national and international standards and codes to: design, operate, inspect and maintain chemical engineering systems.

University Requirements

The university is considered a core of Human Thinking at its highest level, and the source of investment and development of human resources. It is concerned with the rise of the Arabian Civilization and the Historical Heritage of the Egyptian Society, and its traditions. It is also concerned with the education of Religion, Morals and Nationalism (Egyptian National Law for Universities, Law 49 for Year 1972). Therefore, BUE graduates should be able to or aware of:

- National, regional, and international contemporary issues, to have an intellectual and enlightened personality and to interact effectively in the community through different communication skills.
- To achieve this goal, BUE has designed several courses planned to build the student personality, develop his/her skills, and increase his/her awareness of different topics.

- These courses are listed in Table 6.

Faculty Requirements

The Chemical programme offered at the Faculty of Engineering, the British University in Egypt, is an Engineering Programme. The graduates have the privilege of being Engineers and are automatically enrolled in the Egyptian Engineering Syndicate (EES). The graduates are also entitled to take the Fundamentals of Engineering Exam offered by the National Council of Examiners for Engineering and Surveying (NCEES), based on the agreement between EES and NCEES.

Competencies for Engineering Graduates

According to the **National Academic Reference Standards (NARS-2018),** the **Engineering**

Graduate must be able to (A-Level):

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.

A2. Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.

A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.

A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.

A5. Practice research techniques and methods of investigation as an inherent part of learning.

A6. Plan, supervise and monitor implementation of engineering projects.

A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.

A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

A9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.

A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

- *Courses required to achieve these competencies (A-level) are listed in Table 7*

Discipline Requirements (Chemical Engineering Requirements)

According to the National Academic Reference Standards (NARS-2018), each Architectural graduate must meet specific competencies. Thus, in addition to the Competencies of all Engineering Programmes (A-Level), the Chemical Engineering graduate must be able to (B-Level):

B 1. Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.

B 2. Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.

B 3. Apply numerical modelling methods and/or computational techniques appropriate to chemical engineering

B 4. Adopt suitable national and international standards and codes to: design, operate, inspect and maintain chemical engineering systems

- Courses required to achieve these competencies (B-level) are listed in Table 8

Programme Competencies for UK Requirements:

In addition to the competencies for all Engineering Programmes (A-Level) and the competencies for the Chemical Discipline (B-Level), a (C-Level) of competencies were added in order to meet the requirements of QAA subject benchmark statement: Chemical and UK standard for professional engineering competencies. This is considered as an essential requirement for the British Partner. Accordingly, the Chemical Engineering Programme graduate must be able to:

C1. Identify, formulate, and solve problems in the field of chemical engineering.

C2. Design and perform experiments, as well as analyse and interpret experimental results related to chemical engineering.

C3. Integrate a wide range of analytical tools, techniques, equipment, and software packages to design and develop chemical engineering processes.

C4. Design and compare between alternative components, equipment, and systems to optimize chemical engineering processes.

C5. Demonstrate additional abilities related to the field of the concentration within

Chemical Engineering as listed below.

Concentration	**Graduate attributes**
Petrochemical	C-5a Demonstrate additional abilities to apply the knowledge of science and Chemical engineering fundamentals in petrochemical engineering.
Environmental	C-5b Demonstrate additional abilities to apply the knowledge of science and Chemical engineering fundamentals in Environmental engineering.
Pharmaceutical	C-5c Demonstrate additional abilities to apply the knowledge of science and Chemical engineering fundamentals in pharmaceutical engineering.

- Courses required to achieve these competencies (C-level) are listed in Table 9

7. Programme Structure, Levels, Modules, Credits and Awards.

Credit Point System

- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) to be awarded a UK validated degree. This is in addition to the specialist courses (modules) and other requirements of the Egyptian Supreme Council of Universities required for the Egyptian degree.
- The programme is divided into teaching units called modules (courses), which are each assigned a credit weighting.
- Each module (course) is assigned a Level, number of credits and weighting, this reflects the depth of learning required in the relevant programme year.

- A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 36 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study and assessment.
- Students study modules (courses) with a combined weight of 120 credit points in each year (60 credit points per semester)
- Modules (courses) that are delivered in one semester have their assessment completed within the semester in which they are taught. The programme is structured such that formal examinations can take place at the end of each semester.

Academic Semesters

- The academic year is divided into two semesters: Semester 1 and Semester 2.
- Each semester is 15-weeks in length.
- Week 13 being a revision week, and weeks 14- 15 being assessment weeks at the end of each semester.
- The Academic year includes a summer assessment period where students can resit-failed modules (courses).

Programme Levels

- The whole programme, of total 600 credit points, is divided into four levels P, C, I and H (120 for P and 160 for each of C, I and H), according to the Framework for Higher Education Qualifications of UK Degree-Awarding Bodies.
- These levels reflect the depth of learning required in the relevant programme year.
- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) of the UK Degree-Awarding Bodies to be awarded a UK validated degree, in addition to the Egyptian degree.
- Each programme is also divided into **four levels of competencies, as per the NARS 2018**, as follows:
    - Level (0) university requirements
    - Level (A) Faculty requirements
    - Level (B) Discipline requirements
    - Level (C) Programme requirements

Duration of Study

- The duration of Study is five years (10 semesters) including a Preparatory Year.

Programme Structure

- All taught undergraduate programmes at BUE are modular in structure.
- The Chemical Programme is assigned as a credit weighting. A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 35 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study, and assessment. The maximum credit weighting for any one module is normally 30 credits.
- Modules that are delivered over two semesters have 20-50% of their assessment completed in semester one and the remainder in semester two, with formal examinations (where applicable) taking place in weeks 14 to 15 of semester two.

8. Conformity of the Chemical Engineering Programme to Supreme Council of Universities (SCU) Guidelines

The SCU guidelines consists of seven major categories that run throughout the whole programme; namely: Human and Social Sciences; Mathematics and Basic Science, Basic Engineering Science, Applied Engineering Sciences, Computer Applications and ICT, Projects and Practice and Discretionary (Institution character- identifying) Subject with range of weights of [9-12%], [20-26%], [20-23%], [20-22%], [9-11%], [8-11%], and [6-8%] respectively. The credits contribution, of the major categories in Chemical Engineering programme is presented as follows:

Table 1 Indicative Curricula Content by Subject Area

Total no. of hrs / programme = 600									
Curricula Content by Subject Area		**Number of Courses**	**No of Course / levels**					**Total no. of hrs / subject area**	**% of subject area**
			Prep year	**DY1 (hrs)**	**DY2 (hrs)**	**DY3 (hrs)**	**DY4 (hrs)**		
A	**Humanities and social Science**	6	25	10	10	10	-	55	9.2
B	**Mathematics and Basic Science**	14	70	50	20	-	-	140	23.3
C	**Engineering Science**	23	25	60	90	50	-	225	37.5
D	**Applied Engineering and Design**	16	-	-	-	60	120	180	30
	Total No. of hrs /DY		120	120	120	120	120	600	100

Table 2 Major Categories of the Chemical Engineering Programme

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and	Projects and Practice	Discretionary (Institution
University Requirements										
Prep	ENGG01P	Engineering Ethics & Human Rights	5	5						
	ENGL01	English	10	10						
	ENGL02	English Advanced-Writing	10	10						
DY1	CHME12C	Technical Writing & Communication	10	10						
DY2	CHME12I	Economics	10	10						
DY3	CHME16I	Project Management & Entrepreneurship	10	10						
	Level A	**Faculty Requirements**								
Prep	SCIB01P	Math. for Engineers I	10		10					
	MECH01P	Mechanics	10		10					
	SCIB02P	Introductory Physics	10		10					
	MECH02P	Engineering Drawing &Descriptive Geometry	10			10				
	COMP01P	Introduction to computer & programming	5					5		
	SCIB03P	Math. For Engineers II	10		10					
	MECH03P	Production Technology	10			10				
	SCIB04P	Electricity & Magnetism	10		10					
	SCIB05P	Algebra & Geometry	10		10					

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and	Projects and Practice	Discretionary (Institution
	CHME01P	Chemistry for Engineers	10		10					
DY1	SCIB01C	Calculus	10		10					
	SCIB05C	Modern Physics for Chemical Engineers	10		10					
	EMAT04C	Fundamentals of Material Science & Engineering	10			10				
	SCIB02C	Differential Equations	10		10					
	ELEC20C	Electronics & Electric Power Engineering	10			10				
DY2	SCIB10I	Numerical Methods	10		5			5		
	CHME21I	Problem solving using Computers	10					10		
	Level B	**Discipline Requirements**								
DY1	CHME02C	Inorganic Chemistry	10		10					
	CHME05C	Introduction to Chemical Engineering	10			10				
	CHME10C	Organic Chemistry I	10		10					
	CHME16C	Mass and Energy Balance	10			10				
	CHME04C	Analytical Chemistry & Instrumentation	10			10				
	CHME11C	Organic Chemistry II	10			10				
DY2	CHME09C	Fluid Mechanics for Chemical Engineer	10			10				
	CHME18C	Physical chemistry for Chemical Engineers	10			10				
	CHME04I	Polymer Chemistry	10		10					
	CHME23I	Process Data Analysis	10			5		5		
	CHME20C	Engineering Thermodynamics	10			10				

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and	Projects and Practice	Discretionary (Institution
	CHME18C	Chemical Engineering Thermodynamics	10			10				
	CHME22I	Polymer Engineering	10				10			
	CHME03I	Electrochemical Engineering	10				10			
	CHME20I	Heat transfer	10				10			
DY3	CHME04H	Mass Transfer	10				7	3		
	CHME10I	Process Safety	10				10			
	CHME13I	Process Heat Transfer	10				10			
	CHME11I	Chemical Reaction Engineering	10				7	3		
	CHME14I	Process Integration	10				5	5		
	CHME02H	Chemical Engineering Lab	10						10	
	Level C	**UK Requirements**								
DY3	CHME18I	Particle Technology & Solid Processing	10				10			
	CHME05H	Separation Processes	10				10			
	CHME03H	Plant & Process Design	10				5	5		
	CHME17I	Biochemistry & Biochemical Engineering	10			10				
	CHME15I	Process Dynamic and Control	10				7	3		
DY4-Petrochemical	PECE10H	Petrochemical Production Processes	10							10
	PECE11H	Petroleum Refinery Engineering	10							10
	PECE12H	Natural Gas Processing	10							10

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and	Projects and Practice	Discretionary (Institution
	PECE08H	Water Treatment for Petroleum Engineering	10				10			
	PECE05H	Individual Research Project	10						10	
	PECE04H	Group Design Project	10						10	
	PECE07H	Maintenance for Oil & Gas Plants	10				10			
	PECE13H	Petroleum Upgrading Engineering	10							10
	PECE09H	Catalysis	10							10
	PECE02H	Labs for Petrochemical Engineering	10						10	
	PECE05H	Individual Research Project	10						10	
	PECE04H	Group Design Project	10					10		
DY4-Environmental	ENVCE01H	Water & Waste Water Treatment	10				10			
	ENVCE02H	Control of air pollution	10							10
	ENVCE03H	Environmental Engineering & risk management	10							10
	ENVCE14H	Environmental Conscious Process Design	10				5	5		
	PECE05H	Individual Research Project	10						10	
	ENVCE05H	Group Design Project	10						10	
	ENVCE13H	Solid & Hazardous Waste Engineering & Management	10							10
	ENVCE07H	Pollution, legislation, Sampling analysis & Monitoring.	10	2					3	5
	ENVCE15H	Renewable Energy	10				5		5	

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and	Projects and Practice	Discretionary (Institution
	ENVCE16H	Desalination Technology & Energy Conversion	10						5	5
	PECE05H	Individual Research Project	10						10	
	ENVCE05H	Group Design Project	10					10		
Total Petrochemical			600	55	135	135	121	54	50	50
%				9.2%	22.5%	22.5%	20.2%	9%	8.3%	8.3%
Total Environmental			600	57	135	135	121	59	53	40
%				9.5%	22.5%	22.5%	20.2%	9.8%	8.8%	6.7%

Programme Courses

Courses required to achieve University Requirements

Table 3 List of University requirements courses.

Code	Course Title	BUE	Lec	Tut	Lab	TT
ENGL01	English and Academic Purposes	10	0	4	0	4
ENGL02	English and academic writing	10	0	4	0	4
CHME12C	Technical Writing & Communication	10	2	2	0	4
CHME12I	Economics	10	2	2	0	4
CHME16I	Project Management & Entrepreneurship	10	2	2	0	4
Total University requirements		**50**	**6**	**14**	**0**	**20**

Courses Required to achieve the General Competencies of A-level (Faculty Requirements)
A set of courses must be completed as a Faculty Requirement. These courses are divided into Basic Science Courses and Basic Engineering Courses.

Table 4 List of Faculty requirements courses.

Code	Course Title	Contact hours				
		BUE	Lec	Tut	Lab	TT
SCIB01P	Math. for engineers I	10	2	2	0	4
SCCIB02P	Introductory Physics	10	2	1	2	5
SCIB03P	Math. For Engineers II	10	2	2	0	4
SCIB04P	Electricity & Magnetism	10	2	1	2	5
SCIB05P	Algebra & Geometry	10	2	2	0	4
SCIB05C	Modern Physics for Chemical Engineers	10	2	1	2	5
SCIB07C	Calculus	10	2	2	0	4
SCIB08C	Differential Equations	10	2	2	0	4
SCIB10I	Numerical Methods	10	2	1	1	4
ENGG01P	Engineering Ethics & Human Rights	5	1	0	0	1
MECH01P	Engineering Mechanics	10	2	2	0	5
MECH02P	Engineering Drawing & Descriptive Geometry	10	2	3	0	5
MECH03P	Production Technology	10	2	1	1	4
COMP01P	Introduction to Computer & Programming	5	1	0	1	2
CHME01P	Chemistry for Engineers	10	2	1	2	5
Elec20C	Electronics & Electric Power Engineering	10	2	1	2	5
EMAT04C	Fundamentals of Material Science & Engineering	10	2	1	2	5
Total Faculty Requirements		**160**	**30**	**23**	**15**	**61**

Courses Required to achieve Chemical Engineering Requirements of B-level (Discipline Requirements):
A set of courses must be completed as a Basic Chemical Engineering Requirement, in the Chemical Engineering Programme.

Table 5 List of Discipline requirements courses (Chemical Engineering)

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
CHME02C	Inorganic Chemistry	10	2	1	2	5
CHME04C	Analytical Chemistry & Instrumentation	10	2	1	1	4
CHME05C	Introduction to Chemical Engineering	10	2	2	-	4
CHME18C	Physical chemistry for Chemical Engineers	10	2	2	1	5
CHME19C	Chemical Engineering Thermodynamics	10	2	2	-	4
CHME20C	Engineering Thermodynamics	10	2	2	-	4
CHME10C	Organic Chemistry I	10	2	1	2	5
CHME11C	Organic Chemistry II	10	2	1	2	5
CHME21I	Problem solving using computers	10	2	-	2	4

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
CHME23I	Process Data Analysis	10	2	1	1	4
CHME22I	Polymer Engineering	10	2	1	2	5
CHME03H	Plant & Process Design	10	2	2	-	4
CHME04H	Mass Transfer	10	2	1	1	4
CHME05H	Separation Processes	10	2	2	1	5
CHME03I	Electrochemical Engineering	10	2	1	2	5
CHME04I	Polymer Chemistry	10	2	1	2	5
CHME16C	Mass and Energy Balance	10	2	2	-	4
CHME09C	Fluid Mechanics for Chemical Engineer	10	2	1	1	4
CHME10I	Process Safety	10	2	2	-	4
CHME11I	Chemical Reaction Engineering	10	2	2	1	5
CHME02H	Chemical Engineering Lab	10	-	-	3	3
CHME14I	Process Integration	10	2	2	-	4
CHME15I	Process Dynamic and Control	10	2	1	1	4
CHME17I	Biochemistry and Biochemical Engineering	10	2	2	1	5
CHME18I	Particle Technology & Solid Processing	10	2	2	-	4
CHME20I	Heat transfer	10	2	2	1	5
CHME13I	Process Heat Transfer	10	2	2	-	4
Total		**270**	**52**	**39**	**27**	**118**

Courses Required to achieve the Competencies of C-level (Programme Competencies for UK Requirements):
Courses Required to get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed:

Table 6 List of Discipline requirements courses (Chemical Engineering)

Concentration 1: Petrochemical Engineering						
Code	**Course Title**	BUE	Lec	Tut	Lab	TT
PECE04H	Group Design Project	20	2	4	0	6
PECE05H	Individual Research Project	20	2	0	6	8
PECE07H	Maintenance for Oil & Gas Plants	10	2	2	0	4
PECE08H	Water Treatment for Petroleum Engineering	10	2	1	2	5
PECE09H	Catalysis	10	2	1	2	5
PECE10H	Petrochemical Production Processes	10	2	2	0	4
PECE11H	Petroleum Refinery Engineering	10	2	2	0	4
PECE12H	Natural Gas Processing	10	2	2	0	4
PECE13H	Petroleum Upgrading Engineering	10	2	2	0	4
PECE02H	Lab for Petrochemical Engineering	10	1	0	3	4
Petrochemical Requirements		120	19	16	13	48
University + Faculty + Discipline Requirements Total		480	88	76	42	206
Petrochemical Program Requirements Total		**600**	**107**	**92**	**55**	**254**

Concentration 2: Environmental Engineering						
Code	**Course Title**	BUE	Lec	Tut	Lab	TT
ENVCE01H	Water & Wastewater Treatment	10	2	1	2	5
ENVCE02H	Control of air pollution	10	2	2	0	4
ENVCE03H	Environmental Engineering & risk management	10	2	2	0	4
ENVCE05H	Individual Research Project	20	2	0	6	8
ENVCE04H	Group Design Project	20	2	4	0	6
ENVCE07H	Pollution Legislation, Sampling analysis & Monitoring	10	2	1	2	5
ENVCE15H	Renewable Energy	10	2	2	0	4
ENVCE16H	Desalination Technology & Energy Conversion	10	2	2	0	4
ENVCE13H	Solid & Hazardous Waste Engineering &Management	10	2	2	0	4
ENVCE14H	Environmental Conscious Process Design	10	2	2	0	4
	Environmental Requirements	120	20	18	10	48
	University + Faculty + Discipline Requirements Total	480	88	76	42	206
	Environmental Program Requirements Total	**600**	**108**	**94**	**52**	**254**

Concentration 3: Pharmaceutical Engineering						
Code	**Contact Hours**	BUE	Lec	Tut	Lab	TT
PHCE01	Pharmaceutical Product Formulation (1)	10	2	0	2	4
PHCE02	Pharmaceutical Microbiology	10	2	0	2	4
PHCE03	Pharmacology	10	2	0	2	4
PHCE04	Biochemical Engineering	10	2	1	2	5
PHCE05	Pharmaceutical Product Formulation (2)	10	2	0	2	4
PHCE06	Introduction to Biotechnology	10	2	0	2	4
PHCE07	Nano Drug Delivery and Development	10	2	0	2	4
PHCE08	Pharmaceutical Chemistry	10	2	1	2	5
PHCE06H	Individual Research Project	20	2	0	6	8
PHCE05H	Group Design Project	20	2	4	0	6
	Pharmaceutical Requirements	120	20	6	22	48
	University + Faculty + Discipline Requirements Total	480	88	76	42	206
	Pharmaceutical Program Requirements Total	**600**	**108**	**82**	**64**	**254**

Proposed Study Plan

In order to get a Bachelor of Science Degree in this program, and to satisfy the Program Competencies, the following set of courses need to be completed.

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
Preparatory Year - Semester (1)						
22SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
22SCIB02P	Introductory Physics	10	2	1	2	5
22MECH01P	Engineering Mechanics *	10	2	2	0	4
22CHME01P	Chemistry for Engineers *	10	2	1	2	5
22COMP01P	Introduction to Computing *	5	1	0	1	2
22ENGL01	English and Academic Purposes	10	0	4	0	4
22ENGG01P	Engineering Ethics and Human Rights *	5	1	0	0	1
Total		60	10	10	5	25

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
Preparatory Year - Semester (2)						
22SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
22SCIB04P	Electricity and Magnetism	10	2	1	2	5
22SCIB05P	Algebra and Geometry *	10	2	2	0	4
22MECH02P	Engineering Drawing and Descriptive Geometry *	10	2	3	0	5
22MECH03P	Production Technology I *	10	2	2	0	4
22ENGL02	English and academic writing	10	0	4	0	4
Total		60	10	14	2	26

* Modules that are taught to half the cohort in semester one and the other half in semester two.

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY1 - Semester (1)						
22SCIB05C	Modern Physics for Chemical Engineers	10	2	1	2	5
22SCIB01C	Calculus	10	2	2	0	4
22CHME02C	Inorganic Chemistry	10	2	1	2	5
22CHME05C	Introduction to Chemical Engineering	10	2	2	0	4
22CHME10C	Organic Chemistry I	10	2	1	2	5
22CHME12C	Technical Writing & Communication	10	2	2	0	4
Total		60	12	9	6	27

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY1 - Semester (2)						
22ELEC20C	Electronics & Electric Power Engineering	10	2	1	2	5
22EMAT04C	Fundamentals of Material Science & Engineering	10	2	1	2	5
22SCIB02C	Differential Equations	10	2	2	0	4
22CHME04C	Analytical Chemistry & Instrumentation	10	2	1	1	4
22CHME11C	Organic Chemistry II	10	2	1	2	5
22CHME16C	Mass and Energy Balance	10	2	2	0	4
Total		60	12	8	7	27

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY2 - Semester (1)						
22CHME18C	Physical chemistry for Chemical Engineers	10	2	2	1	5
22CHME19C	Engineering Thermodynamics	10	2	2	0	4
22CHME09C	Fluid Mechanics for Chemical Engineer	10	2	1	1	4
22CHME23I	Process Data Analysis	10	2	1	1	4
22CHME04I	Polymer Chemistry	10	2	2	1	5
22CHME12I	Engineering Economics	10	2	2	0	4
Total		60	12	10	4	26

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY2 - Semester (2)						
22SCIB10I	Numerical Methods	10	2	1	1	4
22CHME20C	Chemical Engineering Thermodynamics	10	2	2	0	4
22CHME03I	Electrochemical Engineering	10	2	1	2	5
22CHME20I	Heat transfer	10	2	2	1	5
22CHME21I	Problem solving using Computers	10	2	0	2	4
22CHME22I	Polymer Engineering	10	2	2	1	5
Total		60	12	8	7	27

Code	Course Title					
		BUE	Lec	Tut	Lab	TT
DY2 – Summer Semester						
22ENGG03I	Industrial Training Placement (1)	0	4 weeks			

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY3 - Semester (1)						
22CHME04H	Mass Transfer	10	2	1	1	4
22 CHME16I	Project Management & Entrepreneurship	10	2	2	0	4
22CHME10I	Process Safety	10	2	2	0	4
22CHME11I	Chemical Reaction Engineering	10	2	2	1	5
22CHME14I	Process Integration	10	2	2	0	4
22CHME13I	Process Heat Transfer	10	2	2	0	4
Total		60	12	11	2	25

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY3 - Semester (2)						
CHME03H	Plant & Process Design	10	2	2	0	4
CHME05H	Separation Processes	10	2	2	1	5
CHME02H	Chemical Engineering Lab	10	0	0	3	3
CHME15I	Process Dynamic and Control	10	2	1	1	4
CHME17I	Biochemistry & Biochemical Engineering	10	2	2	1	5
CHME18I	Particle Technology & Solid Processing	10	2	2	0	4
Total		60	10	9	6	25

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY3 – Summer Semester						
22ENGG07H	Industrial Training Placement (2)	0	4 weeks			

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY4 – Petrochemical -Semester (1)						
22PECE08H	Water Treatment for Petroleum Engineering	10	2	1	2	5
22PECE10H	Petrochemical Production Processes	10	2	2	0	4
22PECE11H	Petroleum Refinery Engineering	10	2	2	0	4
22PECE12H	Natural Gas Processing	10	2	2	0	4
22PECE05H	Individual Research Project	10	1	0	3	4
22PECE04H	Group Design Project	10	1	2	0	3
Total		60	10	9	5	24

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY4 – Petrochemical -Semester (2)						
22PECE02H	Labs for Petrochemical Engineering	10	1	0	3	4
22PECE07H	Maintenance for Oil & Gas Plants	10	2	2	0	4
22PECE09H	Catalysis	10	2	1	2	5
22PECE13H	Petroleum Upgrading Engineering	10	2	2	0	4
22PECE05H	Individual Research Project	10	1	0	3	4
22PECE04H	Group Design Project	10	1	2	0	3
Total		60	9	7	8	24

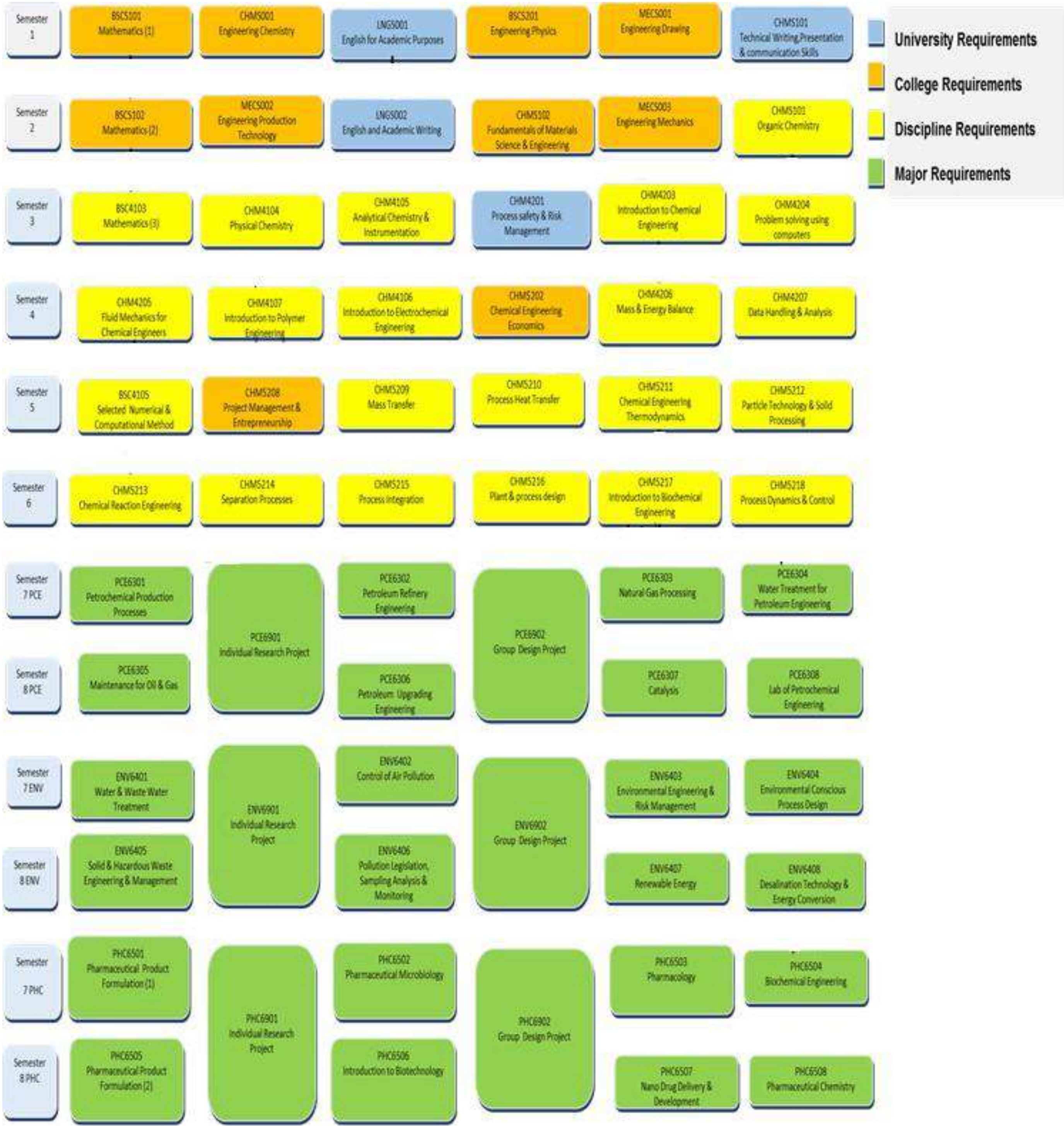
Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY4 – Environmental -Semester (1)						
22ENVCE01H	Water & Waste Water Treatment	10	2	1	2	5
22ENVCE02H	Control of air pollution	10	2	2	0	4
22ENVCE03H	Environmental Engineering & risk management	10	2	2	0	4
22ENVCE14H	Environmental Conscious Process Design	10	2	2	0	4
22ENVCE04H	Individual Research Project	10	1	0	3	4
22ENVCE05H	Group Design Project	10	1	2	0	3
Total		60	10	9	5	24

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY4 – Environmental -Semester (2)						
22ENVCE07H	Pollution,legislation, Sampling analysis & Monitoring.	10	2	1	2	5
22ENVCE13H	Solid & Hazardous Waste Engineering & Management	10	2	2	0	4
22ENVCE15H	Renewable Energy	10	2	2	0	4
22ENVCE16H	Desalination Technology & Energy Conversion	10	2	2	0	4
22ENVCE04H	Individual Research Project	10	1	0	3	4
22ENVCE05H	Group Design Project	10	1	2	0	3
Total		100	10	9	5	24

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY4 – Pharmaceutical Engineering-Semester (1)						
22PHCE01	Pharmaceutical Product Formulation (1)	10	2	0	2	4
22PHCE02	Pharmaceutical Microbiology	10	2	0	2	4
22PHCE03	Pharmacology	10	2	0	2	4
22PHCE04	Biochemical Engineering	10	2	1	2	5
22PHCE06H	Individual Research Project	10	1	0	3	4
22PHCE05H	Group Design Project	10	1	2	0	3
Total		60	10	3	11	24

Code	Course Title	Contact Hours				
		BUE	Lec	Tut	Lab	TT
DY4 – Pharmaceutical Engineering-Semester (2)						
22PHCE05	Pharmaceutical Product Formulation (2)	10	2	0	2	4
22PHCE06	Introduction to Biotechnology	10	2	0	2	4
22PHCE07	Nano Drug Delivery and Development	10	2	0	2	4
22PHCE08	Pharmaceutical Chemistry	10	2	1	2	5
22PHCE06H	Individual Research Project	10	1	0	3	4
22PHCE05H	Group Design Project	10	1	2	0	3
Total		100	10	3	11	24

Programme Courses Tree



9. An Overview of Teaching, Learning and Assessment Strategies to Enable Competencies to be Achieved and Demonstrated

A. Learning and Teaching Methods

Throughout the programme students are encouraged to undertake independent reading both to supplement and consolidate what is being taught and to broaden, develop and reinforce their competencies throughout the programme. Targeted delivery may come from a variety of sources such as

1. Lectures.
2. Tutorials.
3. problem solving classes.
4. laboratory exercises.
5. coursework exercises and self-study and particularly through project work undertaken both in groups and individually.

Further support is gained through study skills delivered as a matter of policy within both the English language programme and individual modules.

10. Support for Learning

- All resources needed for the modules (Courses) are updated and uploaded on the E-Learning https://learn1.bue.edu.eg/course/index.php?categoryid=165
- The tutorials are designed by the module leaders (course leader) to ensure a strong link with module contents to provide students with useful, challenging, good support & practice for the material discussed in lectures.
- Students are provided with feedback related to their submissions within two weeks of submissions.
- For assessed work, feedback is provided in the form of individual written feedback on coursework and as a discussion during tutorials.
- For developmental work, feedback is delivered in the form of dialogue between students and staff in tutorials as well as individual feedback provided in tutorials.
- Weaker students are supported with additional remedial classes and clinics during office hours to uplift their performance.
- A generic exam feedback is developed and posted on E-learning after releasing scripts to students each semester. Students will be notified via e-mail once generic feedback is uploaded.
- Institutional services including the Library, Welfare Counsellor, Faculty services including a Student Support Officer and Programme Handbook.

B. Assessment

Competencies are tested and assessed throughout the programme using a variety of forms that typically include a combination of

1. unseen written examinations.
2. computer aided assessments.
3. coursework assignments.
4. project reports and/or papers.
5. oral presentations.
6. visual presentations.

Coursework forms a particularly important part of the assessment. This method of assessment can

- (i) be used to strongly motivate independent learning
- (ii) improve student planning and time management skills and
- (iii) to develop the comprehension and usage of technical English (particularly important for students at the BUE).

Examinations show how well the student can demonstrate their mastery of an area of scholarly knowledge by selecting appropriate material from memory and applying it to an unseen question in a limited time period. Coursework allows the student to demonstrate wider academic skill of focused scholarly research, drafting, editing and polished writing.
Applied skills are tested and assessed throughout the programme using a combination of coursework assignments, design studies, laboratory logbooks, project reports and/or papers, project logbooks and work placement reports.

11. Crisis and Disaster Management

The faculty of Engineering manages crisis and disaster through the following:

1. Crisis and Disaster Committee
2. Contingency Plan
3. Health and Safety
4. Contact Trees

12. Entry Requirements

In addition to the requirements listed in Part-B, students are required to successfully complete of the Engineering Preparatory Year and passing the entry exam which evaluates student's abilities and architectural skills.
Other admission routes may be considered in accordance with the University's regulations as defined in the Undergraduate Academic Regulations.

13. Quality Assurance and Programme Enhancement

- In accordance with the University's Quality Assurance procedures, as defined in the Annual Quality Assurance and Enhancement Cycle.
- Feedback on all aspects of this programme will be obtained via standard procedures from the University's framework for quality assurance, as defined in the Annual Quality and Enhancement Cycle.

14. Programme Management

- Head of Department
- Programme Director

The programme management is mainly carried out by the HoD. However, the main task of the PD is to monitor the sound delivery of the programme, and the maintenance of academic standards and quality, in line with the University's Strategic Plan for Teaching and Learning.
In addition to the previous, monthly Departmental meetings are carried out with all department's staff members. Related issues are raised for in-depth analysis and discussion to the FTLC that in turn raises with the UTLC and Senate for final decision.

15. Appendices

1. Mapping matrix of Prog. Mission vs. Faculty Mission

Prog. Mission	Faculty Mission
The mission of the Bachelor of Science in Chemical Engineering is to provide students with Quality chemical engineering education, provide services, and carry out basic and applied research.	To provide a broad spectrum of education and research with a British ethos, working with UK and global partners to offer internationally recognized quality degrees that enable graduates to develop their knowledge and entrepreneurship skills and to contribute to community development.

2. Mapping matrix of Prog. Mission vs. Graduates Attributes.

Attributes of Engineering Graduate (CHEM Programme)		Prog. Mission		
		provide students with a quality Chemical Engineering education	provide services	carry out basic and applied research.
1	Be rational and pragmatic, interested in practical steps necessary for a concept to become reality.	X		X
2	Want to achieve sustainable solutions to problems and have strategies for being creative, innovative, and overcoming difficulties by employing their knowledge in a flexible manner.	X		X
3	Be numerate and highly computer literate, and capable of attention to detail.	X	X	X
4	Be cost and value-conscious, and aware of social, cultural, environmental, health and safety, and wider professional responsibilities they should display.	X	X	X
5	Appreciate the international dimension to engineering, commerce and communication.	X		X
6	When faced ith an ethical issue be able to formulate and operate within appropriate codes of conduct.	X	X	X
7	Be professional in their outlook, capable of team working, effective communicators, and able to exercise responsibility.	X	X	X

3. Mapping matrix of Programme Mission to Programme Competencies

SERIAL	Programme Mission	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – >>>>>> ENGINEERING Specialization (B)			
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4
1	provide students with a quality Chemical Engineering education	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2	provide services		x	x	x	x		x	x	x			x		x
3	carry out basic and applied research.	x	x	x	x	x	x	x	x	x	x		x	x	x

4. Mapping matrix of Programme Aims (Objectives) vs. Faculty Aims (Objectives)

SERIAL	Programme Aims (Objectives)	Faculty Aims (Objectives)		
		TEACHING & LEARNING Strategic Objective	RESEARCH Strategic Objective	COMMUNITY SERVICES & ENTERPRISE Strategic Objective
1	Prepare graduates who are skilled chemical and process engineers who serve as professional role models for the next generations.	X		X
2	Prepare graduates who take part in the development of the country's chemical and process industries and are able to work abroad.	X		X
3	Prepare graduates who develop themselves professionally or pursue their graduate studies	X	X	
4	Prepare graduates who apply principles of mathematics, chemistry, and chemical engineering to the design and safe-operation of economically feasible and environmentally performing chemical and petroleum processing systems.	X	X	X

5. Mapping matrix of Programme Aims (Objectives) & Graduates Attributes.

SERIAL	Programme Objectives	Attributes of Engineering Graduate (CHEM Programme) according to NARS 2018						
		Be rational and pragmatic, interested in practical steps necessary for a concept to become reality.	Want to achieve sustainable solutions to problems and have strategies for being creative, innovative and overcoming difficulties by employing their knowledge in a flexible manner.	Be numerate and highly computer literate, and capable of attention to detail.	Be cost and value-conscious, and aware of social, cultural, environmental, health and safety, and wider professional responsibilities they should display.	Appreciate the international dimension to engineering, commerce and communication.	When faced ith an ethical issue be able to formulate and operate within appropriate codes of conduct.	Be professional in their outlook, capable of team working, effective communicators, and able to exercise responsibility.
1	Prepare graduates who are skilled chemical and process engineers who serve as professional role models for the next generations.	X	X	X	X	X		X
2	Prepare graduates who take part in the development of the country's chemical and process industries and are able to work abroad.	X	X	X	X	X	X	
3	Prepare graduates who develop themselves professionally or pursue their graduate studies		X		X		X	X
4	Prepare graduates who apply principles of mathematics, chemistry, and chemical engineering to the design and safe-operation of economically feasible and environmentally performing chemical and petroleum processing systems.	X	X	X	X	X	X	X

6. Mapping Matrix of Programme Aims (Objectives) vs Programme Competencies

SERIAL	**Programme Objectives**	**NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)**										**NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – <<<<<< ENGINEERING Specialization (B)**			
		A1	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**B1**	**B2**	**B3**	**B4**
1	Prepare graduates who are skilled chemical and process engineers who serve as professional role models for the next generations.	x	x	x							x	x		x	
2	Prepare graduates who take part in the development of the country's chemical and process industries and are able to work abroad.				x	x	x						x		x
3	Prepare graduates who develop themselves professionally or pursue their graduate studies							x	x	x	x		x		
4	Prepare graduates who apply principles of mathematics, chemistry, and chemical engineering to the design and safe-operation of economically feasible and environmentally performing chemical and petroleum processing systems.	x	x	x										x	x

7. Mapping matrix of Prog. Competencies vs. Graduate Attributes

Attributes of Engineering Graduate (CHEM Programme)		Attributes of Engineering Graduate (CHEM Programme) according to NARS 2018									
		1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;	**2.** Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;	**3.** Behave professionally and adhere to engineering ethics and standards;	**4.** Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;	**5.** Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	**6.** Value the importance of the environment, both physical and natural, and work to promote sustainability principles;	**7.** Use techniques, skills and modern engineering tools necessary for engineering practice;	**8.** Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;	**9.** Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;	**10.** Demonstrate leadership qualities, business administration and entrepreneurial skills.
1	Be rational and pragmatic, interested in practical steps necessary for a concept to become reality.								×		
2	Want to achieve sustainable solutions to problems and have strategies for being creative, innovative and overcoming difficulties by employing their knowledge in a flexible manner.		×				×				
3	Be numerate and highly computer literate, and capable of attention to detail.							×			
4	Be cost and value-conscious, and aware of social, cultural, environmental, health and safety, and wider professional responsibilities they should disply.										×
5	Appreciate the international dimension to engineering, commerce and communication.	×									
6	When faced ith an ethical issue be able to formulate and operate within appropriate codes of conduct.			×							
7	Be professional in their outlook, capable of team working, effective communicators, and able to exercise responsibility.				×	×				×	

8. Mapping matrix of Courses vs. prog. Competencies (include Prep Year)

Prep Year Modules

Semester	Modules		NARS 2018 Competencies									
	Title	Code	General Competencies (A-Level)									
			A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10
Prep Year Semester 1	Mathematics for Engineers (1)	SCIB01P	X				X				X	
	Introductory Physics	SCIB02P		X				X		X		
	Engineering Mechanics	MECH01P	X	X			X					
	Chemistry for Engineers	CHME01P		X	X				X			
	Introduction to Computing	COMP01P				X						X
	English for Academic Purposes	ENGENGL01								X	X	X
	Engineering Ethics and Human Rights	ENGG01P				X			X	X		
Prep Year Semester 2	Mathematics for Engineers (2)	SCIB03P	X				X				X	
	Electricity and Magnetism	SCIB04P		X					X	X		
	Algebra and Geometry	SCIB05P	X		X		X					
	Engineering Drawing and Descriptive Geometry	MECH02P			X	X						
	Production Technology I	MECH03P				X	X	X				
	English and Academic Writing	ENGENGL02					X		X	X	X	X

Chemical Engineering Modules

SERIAL	Module	Code	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – >>>>>> ENGINEERING Specialization (B)			
			A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4
1	Calculus	SCIB01C	1	1		1		1	1							
2	Inorganic Chemistry	CHME02C		1	1	1			1			1				1
3	Introduction to chemical engineering	CHME05C	1	1	1	1	1					1	1	1		1
4	Modern Physics for Chemical Engineers	SCIB05C	1	1		1						1				
5	Technical Report Writing & Communication	CHME12C	1	1		1							1	1		1
6	Organic Chemistry I	CHME10C	1	1					1				1	1		
7	Differential Equations	SCIB02C	1	1		1		1	1							
8	Electronics & Electrical Power Engineering	ELEC20C	1	1		1						1				
9	Fundamentals to Materials Science and Engineering	EMAT04C	1	1			1		1	1			1	1		
10	Analytical Chemistry & Instrumentation Analysis	CHME04C	1	1		1			1				1	1		1
11	Mass & Energy Balance	CHME16C	1	1	1	1			1				1	1		1
12	Organic Chemistry II	CHME11C	1	1	1		1		1	1			1	1		

13	Physical chemistry for Chemical Engineers	CHME18C	1	1		1			1			1	1	1		1
14	Engineering Thermodynamics	CHME19C	1	1		1		1	1				1	1		1
15	Engineering Economics	CHME12I	1	1	1	1							1	1	1	1
16	Fluid Mechanics for Chemical Engineers	CHME09C	1	1	1	1			1				1	1	1	1
17	Process Data Analysis	CHME23I	1	1	1	1	1		1				1	1		1
18	Polymer Chemistry	CHME04I	1	1			1		1		1		1	1		
19	Chemical Engineering Thermodynamics	CHME20C	1	1		1			1			1	1	1		1
20	Heat Transfer	CHME20I	1	1		1			1				1	1		1
21	Electrochemical Engineering	CHME03I	1	1			1		1	1			1	1		
22	Problem Solving Using Computers	CHME21I	1	1	1		1		1			1	1	1		
23	Numerical Methods	SCIB10I		1	1	1			1				1	1		1
24	Polymer Engineering	CHME22I	1		1		1	1	1	1		1	1	1	1	
25	Mass Transfer	CHME04H	1	1	1				1				1	1		
26	Chemical Reaction Engineering	CHME11I	1	1	1	1			1				1	1		1
27	Project Management and Enterpreneurship	CHME19I					1	1	1	1	1	1		1		
28	Process Heat Transfer	CHME13I			1	1		1				1		1		1
29	Process Integration.	CHME14I			1		1	1	1		1		1	1	1	
30	Process Safety	CHME10I			1	1		1				1				1
31	Process Dynamics and Control	CHME15I	1	1	1	1					1		1	1		1
32	Separation Process	CHME05H		1	1			1	1	1			1	1	1	
33	Chemical Engineering Laboratory	CHME06H			1		1	1		1				1		
34	Plant & Process Design	CHME03H			1	1	1	1	1	1	1	1		1	1	1

35	Particle Technology and Solid Processing	CHME18I			1	1	1	1	1	1		1		1	1	1
36	Biochemistry & Biochemical Engineering	CHME17I	1	1	1	1	1				1		1	1		1
37	Petrochemical Production Processes	PECE10H			1	1	1		1		1	1		1		1
38	Natural Gas Processing	PECE12H			1		1	1	1					1		
39	Petroleum Refinery Engineering	PECE11H			1	1			1		1	1		1		1
40	Water Treatment for Petroleum Eng.	PECE08H		1	1			1	1				1	1	1	
41	Labs for Petrochemical Engineering	PECE02H		1	1		1	1	1	1			1	1		1
42	Maintenance for Oil and Gas Plants	PECE07H				1		1	1			1			1	1
43	Catalysis	PECE09H	1	1		1				1	1	1	1	1		1
44	Petroleum Upgrading Engineering	PECE13H			1	1			1	1	1	1		1		1
45	Group Design Project	PECE04H			1	1	1	1	1	1	1	1	1	1	1	1
46	Individual Research Project	PECE05H		1			1	1	1	1		1	1	1		
47	Water & Wastewater Treatment	ENVCE01H			1		1	1	1					1		
48	Control of Air Pollution	ENVCE02H			1	1	1	1	1			1		1		1
49	Environmental Eng. & Risk Assessment	ENVCE03H	1		1		1				1	1	1	1		
50	Environmental Conscious Process Design	ENVCE14H			1	1	1		1			1				1
51	Solid and Hazardous Waste Engineering and Management	ENVCE13H	1				1			1			1	1		
52	Pollution Sampling Analysis & Monitoring	ENVCE07H	1		1		1		1	1			1	1		
53	Desalination Technology & Energy Conversion	ENVCE16H			1		1	1				1		1		

54	Renewable Energy	ENVCE15H			**1**		**1**	**1**	**1**			**1**		**1**		
55	Group Design Project	ENVCE05H			**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
56	Individual Research Project	PECE05H		**1**			**1**	**1**	**1**	**1**		**1**	**1**	**1**		

9. Teaching and Learning methods vs. Programme Competencies

Programme Competencies	Teaching and Learning Methods						
	Interactive Lectures	Research	Collaborating Learning (Team Project)	Tutorials	Self Study	Labs	others
A1.Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	1			1			
A2.Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	1	1	1	1	1		
A3.Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	1	1	1	1	1	1	
A4.Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	1			1			
A5.Practice research techniques and methods of investigation as an inherent part of learning.	1	1		1	1	1	
A6.Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	1	1	1				
A7.Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.			1				
A8.Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.		1					
A9.Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	1	1		1	1		
A10.Acquire and apply new knowledge; and practice self, lifelong and other learning strategies		1					

B1. Design a practical chemical engineering system, component or process utilizing afull range of chemical engineering principles and techniques including: Mass andEnergy Balance, Thermodynamics, Mass Transfer, Heat Transfer, MomentumTransfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation andControl of Chemical Processes, and Process and Plant Design.	1	1	1	1			
B2.Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.	1	1	1	1	1	1	
B3.Apply numerical modeling methods and/or computational techniques appropriate to chemical engineering.	1		1				
B4.Adopt suitable national and international standards and codes to: design, operate, inspect and maintain chemical engineering systems.	1					1	

10. Assessment methods vs Programme Competencies

Assessment Methods	Competencies													
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4
Online Computer Based Project					1							1		
Group presentation			1			1		1					1	
Group report			1			1		1	1			1		
Group project			1			1		1				1	1	
Class Test 1	1	1	1	1	1	1					1	1		1
Individual report					1						1	1		
Individual presentation					1		1				1	1		
Individual project					1		1			1	1	1		
Practical Assessment	1				1						1	1		
Design Brief (Supervisor)			1		1				1			1		
Lab Report	1	1			1						1	1		1
Interim Report (Panel)		1	1		1		1		1	1		1		
Student's Efforts(Supervisor)		1	1				1		1					
Final Submission (Panel)		1	1				1		1	1		1		
VIVA (Panel)		1	1		1				1			1		
Unseen Exam	1	1	1	1		1					1	1	1	

11. Mapping Matrix of programme competencies vs. QAA Benchmarks Statements

	Egyptian NARS 2018 (Competencies A+B)		UK QAA - Benchmark Statements (2015)
	General (A)		
A1.	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	A1	Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology.
		B1	Identify potential projects and opportunities.
A2.	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	C2	Plan Budget, organise,direct and control tasks, people and resources
		D2	Present and discuss proposals.
		E3	Undertake engineering activities in a way to contribute to sustainable development
A3.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	C3	Lead teams and develop staff to meet changing technical and managerial needs.
		B1	Identify potential projects and opportunities.
		C1	Plan for effective Project implementation.
		E3	Undertake engineering activities in a way to contribute to a sustainable development
		D2	Present and discuss proposals.
A4.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	B3	Manage implementation of design solutions and evaluate their effectiveness
A5.	Practice research techniques and methods of investigation as an inherent part of learning.	C2	Plan Budget, organise,direct and control tasks, people and resources
		D2	Presnt and discuss proposals

		A2	Engage in the creative and innovative development of engineering technology and continuous improvement systems
A6.	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	B2	Manage Implementation of design solutions and evaluate their effectiveness
		D3	Demonstrate personal and social skills.
A7.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	C3	Lead teams and develop staff to meet changing technical and managerial needs.
A8.	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	D1	Communicate in English with others at all levels
A9.	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	C3	Lead teams and develop staff to meet changing technical and managerial needs.
		B3	Manage implementation of design solutions, and evaluate their effectiveness.
A10.	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies	E4	Cary out and record CPD necessary to maintain and enhance competence in own area of practice
	Specialization (B)		
B1.	Design a practical chemical engineering system, component or process utilizing a full range of chemical engineering principles and techniques including: Mass and Energy Balance, Thermodynamics, Mass Transfer, Heat Transfer, Momentum Transfer, Kinetics of Chemical Reactions, Reactor Design, Instrumentation and Control of Chemical Processes, and Process and Plant Design.	A1	Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology.
		B3	Manage implementation of design solutions and evaluate their effectiveness
		B1	Identify potential projects and opportunities
		E2	Manage and apply safe Systems
B2.	Engage in the recent technological changes and emerging fields relevant to	C2	Plan Budget, organise,direct and

	chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer.		control tasks, people and resources
		D2	Presnt and discuss proposals
		B1	Identify potential projects and opportunities
		B3	Manage implementation of design solutions, and evaluate their effectiveness.
		E3	Undertake engineering activities in a way to contribute to a sustainable development
		D2	Communicate in English with others at all levels
B3.	Apply numerical modeling methods and/or computational techniques appropriateto chemical engineering.	B1	Identify potential projects and opportunities
		C1	Plan for effective Project implementation
B4.	Adopt suitable national and international standards and codes to: design, operate, inspect and maintain chemical engineering systems.	C4	Bring about continuous improvement through quality management.
		E1	Comply with relevant codes of conduct
Summary			**#**
Number of Satisfied Competencies			14
Number of Gap Competencies			0
Number of Exceeded Competences			0

مواصفات برنامج الهندسة المدنية

Specifications of Civil Engineering Programme

Programme Description

Civil Engineering is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment. It includes works such as buildings, bridges, roads, canals, and dams. Civil Engineering comprises five major specialty areas, namely, Structural, Geotechnical, Environmental, Water Resources, and Transportation. The program aims at delivering qualified civil engineers to support the current construction boom in Egypt to produce smart structures to establish a strong and sustainable infrastructure for the future.

Career Prospects

There are many career paths and interrelated areas in the field of Civil Engineering, which can progress through many areas of interest in between such as: Structural Engineering, Water Resources and Hydraulics Engineering, Geotechnical Engineering, Environmental Engineering, and Transportation Engineering. Careers directly related to Civil Engineering are diversified and multi-faceted. There are several sub-disciplines within the broad field of Civil Engineering. General Civil Engineers work closely with surveyors on site, and specialized Civil Engineers work towards the design of structures and public works such as drainage, water supply, sewer systems, transportation etc. Civil Engineers usually work for design and consulting offices or construction companies. They can be site engineers or office engineers. They can also work for municipal authorities in the government.

This specification provides the main features of the programme competencies that a typical student might reasonably be expected to achieve and demonstrate if full advantage is taken of the learning opportunities that are provided.

1. Basic Information

1	**Programme title**	**Civil Engineering**
2	**Name of the final award**	**BSc with honours [validated by UK partner]**
3	**Awarding body/institution**	**The British University in Egypt**
4	**Faculty**	**Engineering**
5	**Department**	**Civil Engineering**
6	**Dean (HoD)**	**Prof. Maguid Hassan**
7	**Head of Department**	**Prof. Ghada El-Mahdy**
8	**Programme Director (PD)**	**Dr. Mohamed Eizeldin**
9	**Professional, Statutory and Regulatory Body Accreditation**	**Egyptian Engineering Syndicate**
10	**Date of initial internal review and updates**	**March 2017**
11	**Approval Date to adopt NARS 2018 by:** **Departmental Council** **Faculty Council**	**- 4 October 2020** **- 18 January 2021**

2. Programme Mission

The mission of the Civil Engineering Programme in the Civil Engineering Department is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry, and to achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards, who are independent learners.

3. Programme Aims

The programme aims:

- To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyse complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development.
- To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Civil Engineering.
- To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.
- To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.

4. Distinctive Features of the Programme

The BUE delivers programmes based on a British philosophy of education. This results in programmes that are very much focused on the students rather than those who deliver the material. Graduates from UK programmes typically exhibit:

- the ability to think creatively and with strong problem solving skills;
- high level key and transferable skill sets;
- independently maintained high level of professional and subject specific as well as general technical competence;
- the ability to consider problems at a high level (i.e. to see the big picture);
- diligence and ethical working practices;
- flexibility and the ability to apply their subject-specific knowledge to fields outside of their own.

The BUE Mission is to be the leading provider of high quality UK style education in the MENA region. The University is committed to ensuring UK validation of its programmes and to ensure a student experience that is in line with UK standards. Built on top of institutional quality assurance is subject level validation and the Faculty is committed to ensuring that its UK validating partners confirm that its degree programme is in line with UK standards. An indicator of this will be the dual award of both an Egyptian BSc and a BEng from a UK university in Civil Engineering.

The Civil Engineering Department at BUE strives to provide an up-to-date technical programme, to its students, in order to provide a self-reliant civil engineer who is capable of keeping up and coping with today's and tomorrow's fast changing high tech structures and systems. The programme offers a unique set of modules and specialty areas that allow the student to develop the necessary skills and/or background for purpose.

Furthermore, we will be seeking accreditation of this degree programme with the Institution of Civil Engineers (ICE) through the Joint Board of Moderators (JBM), the UK's leading professional body for this programme discipline. Accredited degree programmes are the preferred and fast track routes for those who aim to obtain the professional qualification of Chartered Engineer (CEng). For a brief overview on the requirements of the Institution of Civil Engineers and why it is important to gain membership refer to: https://www.ice.org.uk.

At the time of writing, and to the best of our knowledge, this combination of academic and professional accreditation makes our programme in Civil Engineering quite unique in both Egypt and the surrounding region.

5. Relevant Subject Benchmark Statements and other External and Internal Reference Points Used to achieve Programme Outcomes

To ensure that the programme complies with the requirements of relevant national and international professional institutions/bodies, and to qualify graduates to apply for memberships in respective institutions and/or gain Chartered Engineer status, the following are used as reference points to inform the programme outcomes:

- The revised UK Quality Code for Higher Education, UKSCQA/02, March 2018 - https://www.qaa.ac.uk/quality-code.
- Descriptor for a higher education qualification at level 6 on the FHEQ; bachelor's degree with honours. UK Quality Code for Higher Education Part A: Setting and Maintaining Academic Standards Part A, The Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies, QAA, October 2014 - https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf
- Annex D: Outcome classification descriptions for FHEQ Level 6 and FQHEIS Level 10 degrees, QAA, 2019 - https://www.qaa.ac.uk/docs/qaa/quality-code/annex-d-outcome-classification-descriptions-for-fheq-level-6-and-fqheis-level-10-degrees.pdf?sfvrsn=824c981_10
- SEEC Credit Level Descriptors for Higher Education, SEEC, 2016 - http://www.seec.org.uk/wp-content/uploads/2016/07/SEEC-descriptors-2016.pdf
- QAA Subject Benchmark Statements: Engineering, March 2023 Subject Benchmark Statement: Engineering (qaa.ac.uk)

- JBM (Joint Board of Moderators): Guidelines for Developing Degree Programmes (AHEP4), April 2022, https://jbm.org.uk/media/ hdojdcyf/guidelines-for-developing-degree-programmes_ahep4.pdf.
- *QAA Subject Benchmark Statements: Engineering, March 2023* Subject Benchmark Statement: Engineering (qaa.ac.uk)
- *Engineering Council Accreditation of Higher Education Programmes: UK Standard for Professional Engineering Competence - UK SPEC 3rd Edition - http://www.engc.org.uk/UKSPEC*
- The Civil Engineering programme originally adopted NARS 2009 and upon the issuing of national Academic Reference Standards (NARS 2018 for Engineering 2nd edition), the programme performed a gap analysis with additional action plan to bridge all gaps if any. Hence, the programme specification is updated to comply with National Academic Reference Standards (NARS 2018) developed by The National Authority of Quality Assurance and Accreditation of Education (NAQAAE), https://admin.naqaae.eg/api/v1/archive/download/34733).

6. Graduate Attributes

The creative way of approaching all engineering challenges is being seen increasingly as a 'way of thinking' which is generic across all disciplines. The Civil Engineering Programme adopted the NARS 2018 attributes for Engineering and Civil Engineering. The graduates of Civil Engineering should have the ability to:

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.
2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.
3. Behave professionally and adhere to engineering ethics and standards.
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.
7. Use techniques, skills, and modern engineering tools necessary for engineering practice.
8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.
9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.

In addition to the general attributes of engineer, the civil engineer must be able to:

- Act professionally in design and supervision of Civil Engineering disciplines.
- Use the codes of practice of all Civil Engineering disciplines effectively and professionally.
- Design, construct and protect all types of excavations and tunnelling systems for different purposes.
- Manage construction sites efficiently.
- Select appropriate building materials from the perspective of strength, durability, suitability of use to location, temperature, weather conditions and impacts of seawater and environment.
- Select and design adequate water control structures, irrigation and water networks, sewerage systems and pumping stations.
- Define and preserve properties (lands, real estates) of individuals, communities and institutions, through different surveying and GIS tools.
- Design and construct structures for protection against dangers of unexpected natural events such as floods and storms.
- Lead and supervise a group of designers and site or lab technicians.
- Be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality.
- Seek to achieve sustainable solutions to problems and have strategies for being creative, innovative and overcoming difficulties by employing their skills, knowledge and understanding in a flexible manner.
- Be skilled at solving problems by applying their numerical, computational, analytical and technical skills, using appropriate tools.
- Be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional responsibilities.
- Be familiar with the nature of business and enterprise in the creation of economic and social value.
- Appreciate the global dimensions of engineering, commerce and communication.
- Be able to formulate and operate within appropriate codes of conduct, when faced with an ethical issue.
- Be professional in their outlook, be capable of team working.
- Be effective communicators, and be able to exercise responsibility and sound management approaches.

University Requirements

The university is considered a core of Human Thinking at its highest level, and the source of investment and development of human resources. It is concerned with the rise of the Arabian Civilization and the Historical Heritage of the Egyptian Society, and its traditions. It is also concerned with the education of Religion, Morals and Nationalism (Egyptian National Law for Universities, Law 49 for Year 1972). Therefore, BUE graduates should be able to or aware of:

- National, regional, and international contemporary issues, to have an intellectual and enlightened personality and to interact effectively in the community through different communication skills.
- To achieve this goal, BUE has designed several courses planned to build the student personality, develop his/her skills, and increase his/her awareness of different topics. These courses are listed in Table 6.

Faculty Requirements

The Civil Engineering programme offered at the Faculty of Engineering, the British University in Egypt, is an Engineering Programme. The graduates have the privilege of being Engineers and are automatically enrolled in the Egyptian Engineering Syndicate (EES). The graduates are also entitled to take the Fundamentals of Engineering Exam offered by the National Council of Examiners for Engineering and Surveying (NCEES), based on the agreement between EES and NCEES.

Competencies for Engineering Graduates

According to the **National Academic Reference Standards (NARS-2018),** the **Engineering Graduate must be able to (A-Level):**

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
A2. Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.
A5. Practice research techniques and methods of investigation as an inherent part of learning.
A6. Plan, supervise and monitor implementation of engineering projects.
A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
A9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

- Courses required to achieve these competencies (A-level) are listed in Table 7

Discipline Requirements (Civil Engineering Requirements)

According to the National Academic Reference Standards (NARS-2018), each Civil Engineering graduate must meet specific competencies. Thus, in addition to the Competencies of all Engineering Programmes (A-Level), the Civil Engineering graduate must be able to (B-Level):

B1. Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics;

B2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbours; or any other emerging field relevant to the discipline;

B3. Plan and manage construction processes, address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects;

B4. Deal with biddings, contracts and financial issues including project insurance and guarantees.

- Courses required to achieve these competencies (B-level) are listed in Table 8

Programme Competencies for UK Requirements:

The Civil Engineering Programme adopted the National Reference Standards (NARS) issued in 2018 at the level of competencies (A & B) considering A as general competencies for all engineers and B as specialized competencies for civil engineering.

In order to meet the advanced programme which is considered as an essential requirement for the British Partner and QAA, the Programme also adopted (ARS) at the level of (C) for professional engineering competencies.

Accordingly, the Civil Engineering Programme graduate must be able to:

C1. Acquire modern knowledge, model, and apply advanced software packages in at least two of the following topics: advanced structural analysis and finite element analysis, and earthquake engineering, pre-stressed concrete, bridge engineering, structural analysis programming, and dynamic analysis of structures.

C2. Conduct research and write a dissertation on any of the following topics: structures, construction management, hydraulics and irrigation, environmental engineering, transportation engineering, surveying, or foundation engineering.

- Courses required to achieve these competencies (C-level) are listed in Table 9

7. Programme Structure, Levels, Modules, Credits and Awards.

Credit Point System

- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) to be awarded a UK validated degree. This is in addition to the specialist courses (modules) and other requirements of the Egyptian Supreme Council of Universities required for the Egyptian degree.
- The programme is divided into teaching units called modules (courses), which are each assigned a credit weighting.
- Each module (course) is assigned a Level, number of credits and weighting, this reflects the depth of learning required in the relevant programme year.
- A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 36 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study and assessment.
- Students study modules (courses) with a combined weight of 120 credit points (36 credit hours) in each year (60 credit points per semester)
- Modules (courses) that are delivered in one semester have their assessment completed within the semester in which they are taught. The programme is structured such that formal examinations can take place at the end of each semester.

Academic Semesters

- The academic year is divided into two semesters: Semester 1 and Semester 2.
- Each semester is 15-weeks in length.
- Week 13 being a revision week, and weeks 14- 15 being assessment weeks at the end of each semester.
- The Academic year includes a summer assessment period where students can resit-failed modules (courses).

Programme Levels

- The whole programme, of total 600 credit points, is divided into four levels P, C, I and H (Preparatory, Certificate, Intermediate, and Honour Levels) (120 for P and 160 for each of C, I and H), according to the Framework for Higher Education Qualifications of UK Degree-Awarding Bodies.
- These levels reflect the depth of learning required in the relevant programme year.
- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) of the UK Degree-Awarding Bodies to be awarded a UK validated degree, in addition to the Egyptian degree.
- Each programme is also divided into **four levels of competencies, as per the NARS 2018**, as follows:
  - Level (0) university requirements
  - Level (A) Faculty requirements
  - Level (B) Discipline requirements
  - Level (C) Programme requirements

Duration of Study

- The duration of Study is five years (10 semesters) including a Preparatory Year.

Programme Structure

- All taught undergraduate programmes at BUE are modular in structure.
- The Civil Engineering Programme is assigned as a credit weighting. A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 36 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study, and assessment. The maximum credit weighting for any one module is normally 20 credits.
- Modules that are delivered over two semesters have 20-50% of their assessment completed in semester one and the remainder in semester two, with formal examinations (where applicable) taking place in weeks 14 and 15 of semester two.

8. Conformity of the Civil Engineering Programme to Supreme Council of Universities (SCU) Guidelines

The SCU guidelines consists of seven major categories that run throughout the whole programme; namely: Human and Social Sciences; Mathematics and Basic Science, Basic Engineering Science, Applied Engineering Sciences, Computer Applications and ICT, Projects and Practice and Discretionary (Institution character- identifying) Subject with range of weights of [9-12%], [20-26%], [20-23%], [20-22%], [9-11%], [8-11%], and [6-8%] respectively. The credits contribution, of the major categories in the Civil Engineering programme is presented as follows:

Table 4 Indicative Curricula Content by Subject Area

Total no. of hrs / programme = 600											
Curricula Content by Subject Area		Number of Courses	No of Course / levels					Total no. of hrs / subject area	% of subject area	Total % of NARS
			Prep year	DY1 (hrs)	DY2 (hrs)	DY3 (hrs)	DY4 (hrs)			
A	Humanities and social Science	6	3	-	1	1	1	55	9%	9-12
B	Mathematics and Basic Science	13	7	4	1	1	-	130	22%	20-26
C	Basic Engineering Science	14	2	4	5	3	-	140	23%	20-23
D	Applied Engineering and Design	13	-	-	2	5	6	130	22%	20-22
E	Computer Applications and ICT	6	1	1	2	1	1	55	9%	9-11
F	Projects and Practice	4	-	1	1	1	1	50	8%	8-11
G	Discretionary (Institution character- identifying) Subject	3	-	2	-	-	1	40	7%	6-8
	Total No. of hrs /DY		120	120	120	120	120	600		

Table 5 Major Categories of the Civil Engineering Programme

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
University Requirements										
Prep	ENGENG L01	English for Academic Purposes	10	X						
Prep	ENGG01P	Engineering Ethics and Human Rights	10	X						
Prep	ENGENG L02	English and Academic Writing	10	X						
1	CIVL11C	Research and Communication Skills	10					X		
3	CIVL23H	Construction Contract Procedures	10	X						
	Level A	**Faculty Requirements**								
Prep	MECH01P	Engineering Mechanics	10		X					
Prep	MECH02P	Engineering Drawing & Descriptive Geometry	10			X				
Prep	SCIB01P	Mathematics for Engineers (1)	10		X					
Prep	COMP01P	Introduction to Computing	10					X		
Prep	SCIB02P	Introductory Physics	10		X					
Prep	CHME01P	Chemistry for Engineers	10		X					
Prep	SCIB03P	Mathematics for Engineers (2)	10		X					
Prep	SCIB04P	Electricity and Magnetism	10		X					
Prep	SCIB05P	Algebra and Geometry	10		X					
Prep	MECH03P	Production Technology I	10			X				
1	CIVL02C	Civil Engineering Drawing	10							X
1	CIVL15C	Rigid Body Mechanics	10		X					
1	SCIB01C	Calculus	10		X					

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
1	SCIB02C	Differential Equations	10		X					
2	CIVL16I	Construction Management	10	X						
2	SCIB02I	Numerical Methods	10		X					
3	SCIB03I	Statistics for Engineers	10		X					
	Level B	**Discipline Requirements**								
1	CIVL01C	Construction Technology and Management	10							X
1	CIVL03C	Structural Analysis and Mechanics (1)	10			X				
1	CIVL04C	Surveying (1)	10						X	
1	CIVL05C	Soil Mechanics (1)	10			X				
1	CIVL06C	Construction Engineering Materials (1)	10			X				
1	CIVL12C	Introduction to Construction Engineering Materials	10			X				
1	CIVL13C	Fluid Mechanics	10		X					
2	CIVL07C	Structural Analysis and Mechanics (2)	10			X				
2	CIVL09C	Computer Applications in Civil Engineering	10					X		
2	CIVL10C	Hydraulics (1)	10			X				
2	CIVL14C	Computer Aided Drafting	10					X		
2	CIVL01I	Construction Engineering Materials (2)	10			X				
2	CIVL03I	Hydrology and Water Engineering	10			X				
2	CIVL04I	Structural Steel Design (1)	10				X			
2	CIVL05I	Surveying (2)	10						X	

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
2	CIVL06I	Soil Mechanics (2)	10			X				
2	CIVL07I	Reinforced Concrete Design (1)	10				X			
3	CIVL08I	Structural Analysis and Mechanics (3)	10			X				
3	CIVL13I	Irrigation Works Design (1)	10				X			
3	CIVL15I	Field Courses	10						X	
3	CIVL01H	Hydraulics (2)	10			X				
4	CIVL09H	Project Management	10	X						
	Level C	**Major Requirements**								
3	CIVL09I	Water Distribution & Sewerage Systems	10				X			
3	CIVL11I	Reinforced Concrete Design (2)	10				X			
3	CIVL12I	Transport Systems	10			X				
3	CIVL14I	Water & Wastewater Treatment	10				X			
3	CIVL02H	Structural Analysis and Mechanics (4)	10					X		
3	CIVL03H	Structural Steel Design (2)	10				X			
4	CIVL04H	Geoinformatics	10					X		
4	CIVL05H	Foundation Engineering	10				X			
4	CIVL07H	Irrigation Works Design (2)	10				X			
4	CIVL08H	Highway and Airport Engineering	10				X			
4	CIVL10H	Advanced Reinforced Concrete Design	10				X			
4	CIVL27H	Group Design Project	20						X	
4	CIVL30H	Individual Research Project	20							X

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
4		Elective Course 1	10				X			
4		Elective Course 2	10				X			
		Elective Courses								
4	CIVL11H	Bridge Engineering	10				X			
4	CIVL12H	Water Pollution Control Process	10				X			
4	CIVL13H	Wastewater Reclamation & Reuse	10				X			
4	CIVL15H	Pavement Design	10				X			
4	CIVL16H	Transportation Planning	10				X			
4	CIVL19H	Pre-stressed Concrete	10				X			
4	CIVL21H	Earthquake Resistant Design	10				X			
4	CIVL25H	Strategic Management in Construction	10				X			
4	CIVL26H	Value & Risk Management in Construction	10				X			
Total			600	55	130	140	130	55	50	40
%			100	9	22	23	22	9	8	7

Programme Courses

Courses required to achieve University Requirements

Table 6 List of University requirements courses.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
ENGENGL01	English for Academic Purposes	10	0	4	0	4
ENGENGL02	English and Academic Writing	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights	5	2	0	0	2
CIVL11C	Research and Communication Skills	10	2	1	0	3
CIVL23H	Construction Contract Procedures	10	2	1	0	3
Total University requirements		**45**	**6**	**10**	**0**	**16**

Courses Required to achieve the General Competencies of A-level (Faculty Requirements)

A set of courses must be completed as a Faculty Requirement. These courses are divided into Basic Science Courses and Basic Engineering Courses.

Table 7 List of Faculty requirements courses.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry	10	2	2	0	4
MECH01P	Engineering Mechanics	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry	10	2	3	0	5
MECH03P	Production Technology I	10	2	2	0	4
CHME01P	Chemistry for Engineers	10	2	1	2	5
COMP01P	Introduction to Computing	5	2	0	2	4
CIVL02C	Civil Engineering Drawing	10	1	2	0	3
CIVL15C	Rigid Body Mechanics	10	2	2	0	4
SCIB01C	Calculus	10	2	2	0	4

SCIB02C	Differential Equations	10	2	2	0	4
CIVL16I	Construction Management	10	2	1	0	3
SCIB02I	Numerical Methods	10	2	2	0	4
SCIB03I	Statistics for Engineers	10	2	2	0	4
ENGG03I	Industrial Training Placement (1)	0	0	0	0	0
ENGG07H	Industrial Training Placement (2)	0	0	0	0	0
Total Faculty Requirements		**165**	**33**	**29**	**8**	**70**

Courses Required to achieve Civil Engineering Requirements of B-level (Discipline Requirements):

A set of courses must be completed as a Basic Civil Engineering Requirements, in the Civil Engineering Programme.

Table 8 List of Discipline requirements courses (Civil Engineering)

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	BUE	Lab	TT
CIVL01C	Construction Technology and Management	10	2	1	1.3	4.3
CIVL03C	Structural Analysis and Mechanics (1)	10	2	2	0	4
CIVL04C	Surveying (1)	10	2	1	0	3
CIVL12C	Introduction to Construction Engineering Materials	10	2	1.3	0.7	4
CIVL05C	Soil Mechanics (1)	10	2	0.7	0.3	3
CIVL06C	Construction Engineering Materials (1)	10	2	1.3	0.7	4
CIVL13C	Fluid Mechanics	10	2	0.7	0.3	3
CIVL07C	Structural Analysis and Mechanics (2)	10	2	2	0	4
CIVL09C	Computer Applications in Civil Engineering	10	1	0	2	3
CIVL10C	Hydraulics (1)	10	2	0.7	0.3	3
CIVL14C	Computer Aided Drafting	10	1	0	2	3
CIVL01I	Construction Engineering Materials (2)	10	2	0.7	0.3	3
CIVL03I	Hydrology and Water Engineering	10	2	1	0	3
CIVL04I	Structural Steel Design (1)	10	2	2	0	4
CIVL05I	Surveying (2)	10	2	0.5	0.5	3
CIVL06I	Soil Mechanics (2)	10	2	0.7	0.3	3
CIVL07I	Reinforced Concrete Design (1)	10	2	2	0	4
CIVL08I	Structural Analysis and Mechanics (3)	10	2	2	0	4
CIVL13I	Irrigation Works Design (1)	10	2	1	0	3
CIVIL15I	Field Courses	10	0	5	1.3	6.3
CIVL01H	Hydraulics (2)	10	2	0.7	0.3	3
CIVL09H	Project Management	10	2	1	0	3
Total		220	40	27.3	10.3	77.6

Courses Required to achieve the Competencies of C-level (Programme Competencies for UK Requirements):

Courses Required to get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed:

Table 9 List of Discipline requirements courses (Civil Engineering)

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	BUE	Lec	TT
	University Requirements	**45**	**6**	**10**	**0**	**16**
	Faculty of Engineering Requirements	**165**	**33**	**29**	**8**	**70**
	Discipline Civil Engineering Requirement	220	40	27.3	10.3	77.6
University + Faculty + Discipline Requirements Total		430	79	66.3	18.3	163.6
	Major Programme Requirements					
CIVL09I	Water Distribution & Sewerage Systems	10	2	1	0	3
CIVL11I	Reinforced Concrete Design (2)	10	2	2	0	4
CIVL12I	Transport Systems	10	2	1	0	3
CIVL14I	Water & Wastewater Treatment	10	2	0.75	0.25	3
CIVL02H	Structural Analysis and Mechanics (4)	10	2	2	0	4
CIVL03H	Structural Steel Design (2)	10	2	2	0	4
CIVL04H	Geoinformatics	10	2	0.5	0.5	3
CIVL05H	Foundation Engineering	10	2	2	0	4
CIVL07H	Irrigation Works Design (2)	10	2	1	0	3
CIVL08H	Highway and Airport Engineering	10	2	1	0	3
CIVL10H	Advanced Reinforced Concrete Design	10	2	2	0	4
CIVL27H	Group Design Project	20	0	1	0	1
CIVL30H	Individual Research Project	20	0	1	0	1
CIVLXXH	Elective Course 1	10	2	1	0	3
CIVLXXH	Elective Course 2	10	2	1	0	3
Programme Requirements Total		170	26	19.3	0.8	46
Civil Engineering Programme Requirements Total		600	105	85.6	19.1	209.6

Pool 1 of Elective Courses

DY4 - Semester (1)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CIVL12H	Water Pollution Control Process	10	2	1	0	3
CIVL15H	Pavement Design	10	2	1	0	3
CIVL21H	Earthquake Resistant Design	10	2	1	0	3
CIVL25H	Strategic Management in Construction	10	2	1	0	3

Pool 2 of Elective Courses						
DY4 - Semester (2)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CIVL11H	Bridge Engineering	10	2	1	0	3
CIVL13H	Wastewater Reclamation and Reuse	10	2	1	0	3
CIVL16H	Transportation Planning	10	2	1	0	3
CIVL19H	Pre-stressed Concrete	10	2	1	0	3
CIVL26H	Value & Risk Management in Construction	10	2	1	0	3

Proposed Study Plan

To get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed.

Preparatory Year - Semester (1)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
MECH01P	Engineering Mechanics *	10	2	2	0	4
CHME01P	Chemistry for Engineers *	10	2	1	2	5
COMP01P	Introduction to Computing *	5	2	0	2	4
ENGENGL01	English for Academic Purposes	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights *	5	2	0	0	2
	Total	60	12	10	6	28

Preparatory Year - Semester (2)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry *	10	2	2	0	4
MECH02P	Engineering Drawing & Descriptive Geometry*	10	2	3	0	5
MECH03P	Production Technology I *	10	2	2	0	4
ENGENGL02	English and Academic Writing	10	0	4	0	4
	Total	60	10	14	2	26

*** Modules that are taught to half the cohort in semester one and the other half in semester two.**

DY1 - Semester (1)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CIVL01C	Construction Technology and Management	10	2	1	1.3	4.3
CIVL02C	Civil Engineering Drawing	10	1	2	0	3
CIVL04C	Surveying (1)	10	2	1	0	3
CIVL15C	Rigid Body Mechanics	10	2	2	0	4
CIVL12C	Introduction to Construction Engineering Materials	10	2	1.3	0.7	4
SCIB01C	Calculus	10	2	2	0	4
Total		60	10	11	9.3	2

DY1 - Semester (2)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CIVL03C	Structural Analysis and Mechanics (1)	10	2	2	0	4
CIVL05C	Soil Mechanics (1)	10	2	0.7	0.3	3
CIVL06C	Construction Engineering Materials (1)	10	2	1.3	0.7	4
CIVL11C	Research and Communication Skills	10	2	1	0	3
CIVL13C	Fluid Mechanics	10	2	0.7	0.3	3
SCIB02C	Differential Equations	10	2	2	0	4
Total		60	12	7.7	1.3	21

DY2 - Semester (1)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CIVL07C	Structural Analysis and Mechanics (2)	10	2	2	0	4
CIVL10C	Hydraulics (1)	10	2	0.7	0.3	3
CIVL14C	Computer Aided Drafting	10	1	0	2	3
CIVL09C	Computer Applications in Civil Engineering	10	1	0	2	3
CIVL01I	Construction Engineering Materials (2)	10	2	0.7	0.3	3
CIVL16I	Construction Management	10	2	1	0	3
Total		60	10	4.4	4.6	19

DY2 - Semester (2)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT

CIVL03I	Hydrology and Water Engineering	10	2	1	0	3
SCIB02I	Numerical Methods	10	2	2	0	4
CIVL04I	Structural Steel Design (1)	10	2	2	0	4
CIVL06I	Soil Mechanics (2)	10	2	0.7	0.3	3
CIVL07I	Reinforced Concrete Design (1)	10	2	2	0	4
CIVL05I	Surveying (2)	10	2	0.5	0.5	3
Total		60	12	8.2	0.8	21

DY2 - Summer Semester			
Code	Course Title	Credits	Contact Hours
		BUE	Training Hours
ENGG03I	Industrial Training Placement (1)	0	200

DY3 - Semester (1)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CIVL08I	Structural Analysis and Mechanics (3)	10	2	2	0	4
CIVL09I	Water Distribution & Sewerage Systems	10	2	1	0	3
CIVL11I	Reinforced Concrete Design (2)	10	1	2	0	4
CIVL01H	Hydraulics (2)	10	1	0.7	0.3	3
SCIB03I	Statistics for Engineers	10	2	2	0	4
CIVIL15I	Field Courses	10	2	5	1.3	6.3
Total		60	10	12.7	1.6	24.3

DY3 - Semester (2)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CIVL23H	Construction Contract Procedures	10	2	1	0	3
CIVL12I	Transport Systems	10	2	1	0	3
CIVL13I	Irrigation Works Design (1)	10	2	1	0	3
CIVL14I	Water & Wastewater Treatment	10	2	0.75	0.25	3
CIVL02H	Structural Analysis and Mechanics (4)	10	2	2	0	4
CIVL03H	Structural Steel Design (2)	10	2	2	0	4
Total		60	12	7.75	0.25	20

DY3 - Summer Semester			
Code	Course Title	Credits	Contact Hours
		BUE	Training Hours
ENGG07H	Industrial Training Placement (2)	0	200

DY4 - Semester (1)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CIVL30H	Individual Research Project	10	0	0.5	0	0.5
CIVL27H	Group Design Project	10	0	0.5	0	0.5
CIVL05H	Foundation Engineering	10	2	2	0	4
CIVL07H	Irrigation Works Design (2)	10	2	1	0	3
CIVL08H	Highway and Airport Engineering	10	2	1	0	3
CIVLXXH	Elective Course 1	10	2	1	0	3
Total		60	8	6	0	14

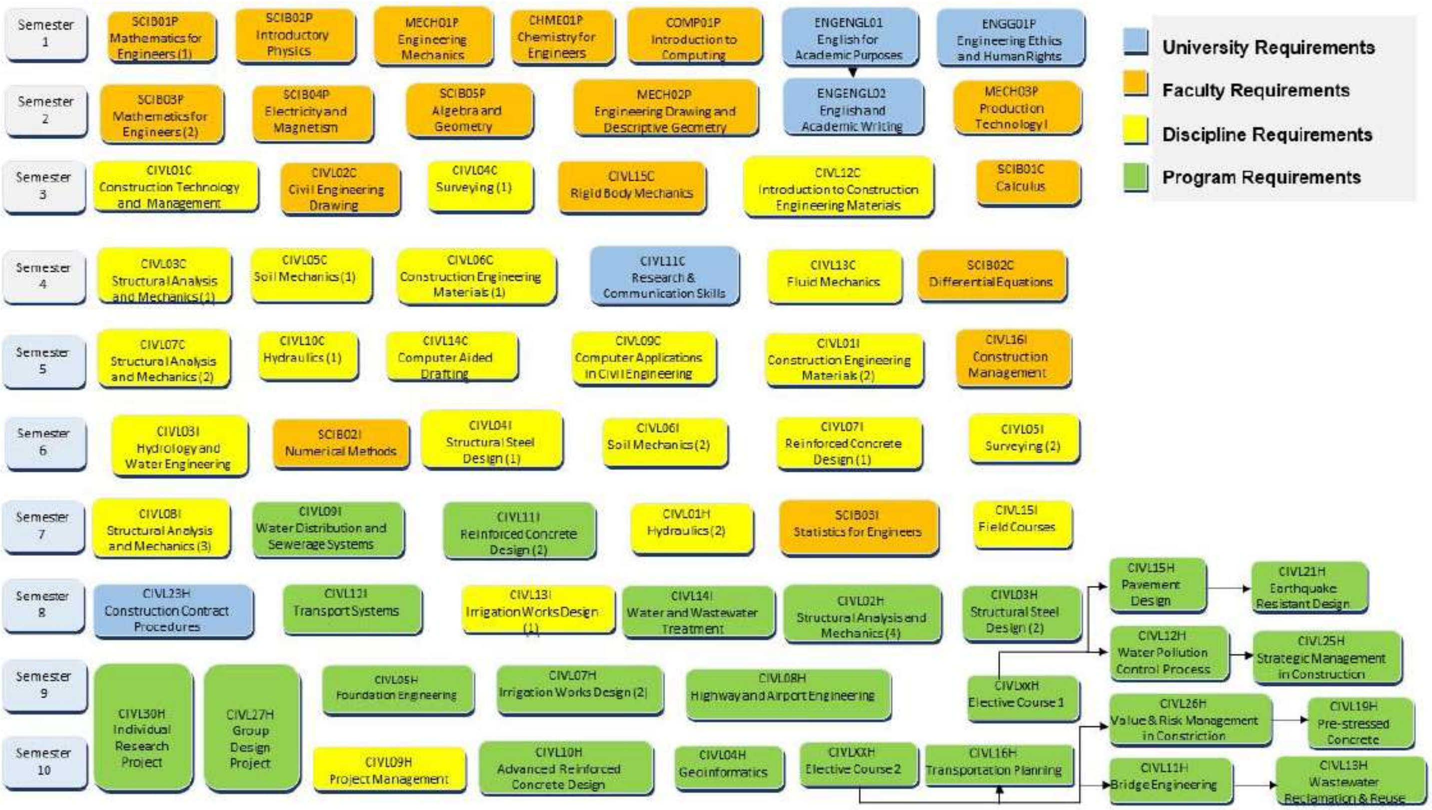
DY4 - Semester (2)						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CIVL30H	Individual Research Project	10	0	0.5	0	0.5
CIVL27H	Group Design Project	10	0	0.5	0	0.5
CIVL09H	Project Management	10	2	1	0	3
CIVL10H	Advanced Reinforced Concrete Design	10	2	2	0	4
CIVL04H	Geoinformatics	10	2	0.5	0.5	3
CIVLXXH	Elective Course 2	10	2	1	0	3
Total		60	8	5.5	0.5	14

DY4 - Semester (1) Pool 1 of Elective Courses						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CIVL12H	Water Pollution Control Process	10	2	1	0	3
CIVL15H	Pavement Design	10	2	1	0	3
CIVL21H	Earthquake Resistant Design	10	2	1	0	3
CIVL25H	Strategic Management in Construction	10	2	1	0	3

DY4 - Semester (2) Pool 2 of Elective Courses						
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT

CIVL11H	Bridge Engineering	10	2	1	0	3
CIVL13H	Wastewater Reclamation and Reuse	10	2	1	0	3
CIVL16H	Transportation Planning	10	2	1	0	3
CIVL19H	Pre-stressed Concrete	10	2	1	0	3
CIVL26H	Value & Risk Management in Construction	10	2	1	0	3

Programme Courses Tree



9. An Overview of Teaching, Learning and Assessment Strategies to Enable Competencies to be Achieved and Demonstrated

A. Learning and Teaching Methods

Throughout the programme students are encouraged to undertake independent reading both to supplement and consolidate what is being taught and to broaden, develop and reinforce their competencies throughout the programme. Targeted delivery may come from a variety of sources such as

1. Lectures.
2. Tutorials.
3. Problem solving classes.
4. Laboratory exercises.
5. Coursework exercises, self-study and particularly through project work undertaken both in groups and individually.

Further support is gained through study skills delivered as a matter of policy within both the English language programme and individual modules.

10. Support for Learning

- All resources needed for the modules (Courses) are updated and uploaded on the E-Learning https://learn1.bue.edu.eg/ .
- The tutorials are designed by the module leaders (course leader) to ensure a strong link with module contents to provide students with useful, challenging, good support & practice for the material discussed in lectures.
- Students are provided with feedback related to their submissions within two weeks of submissions.
- For assessed work, feedback is provided in the form of individual written feedback on coursework and as a discussion during tutorials.
- For developmental work, feedback is delivered in the form of dialogue between students and staff in tutorials as well as individual feedback provided in tutorials.
- Weaker students are supported with additional remedial classes and clinics during office hours to uplift their performance.
- A generic exam feedback is developed and posted on E-learning after releasing scripts to students each semester. Students will be notified via e-mail once generic feedback is uploaded.
- Institutional services including the Library, Welfare Counsellor, Faculty services including a Student Support Officer and Programme Handbook.

B. Assessment

Competencies are tested and assessed throughout the programme using a variety of forms that typically include a combination of

1. Unseen written examinations.
2. Computer aided assessments.
3. Coursework assignments.
4. Project reports and/or papers.
5. Oral presentations.
6. Visual presentations.

Coursework forms a particularly important part of the assessment. This method of assessment can

(i) be used to strongly motivate independent learning
(ii) improve student planning and time management skills and
(iii) to develop the comprehension and usage of technical English (particularly important for students at the BUE).

Examinations show how well the student can demonstrate their mastery of an area of scholarly knowledge by selecting appropriate material from memory and applying it to an unseen question in a limited time period. Coursework allows the student to demonstrate wider academic skill of focused scholarly research, drafting, editing and polished writing.

Applied skills are tested and assessed throughout the programme using a combination of coursework assignments, design studies, laboratory logbooks, project reports and/or papers, project logbooks and work placement reports.

11. Crisis and Disaster Management

The faculty of Engineering manages crisis and disaster through the following:

1. Crisis and Disaster Committee
2. Contingency Plan
3. Health and Safety
4. Contact Trees

12. Entry Requirements

In addition to the requirements listed in Part-B, students are required to successfully complete of the Engineering Preparatory Year. -

Other admission routes may be considered in accordance with the University's regulations as defined in the Undergraduate Academic Regulations.

13. Quality Assurance and Programme Enhancement

- In accordance with the University's Quality Assurance procedures, as defined in the Annual Quality Assurance and Enhancement Cycle.
- Feedback on all aspects of this programme will be obtained via standard procedures from the University's framework for quality assurance, as defined in the Annual Quality and Enhancement Cycle.

14. Programme Management

- Head of Department
- Programme Director

The programme management is mainly carried out by the HoD. However, the main task of the PD is to monitor the sound delivery of the programme, and the maintenance of academic standards and quality, in line with the University's Strategic Plan for Teaching and Learning.

In addition to the previous, monthly Departmental meetings are carried out with all department's staff members. Related issues are raised for in-depth analysis and discussion to the FTLC that in turn raises with the UTLC and Senate for final decision.

15. Appendices

1. Mapping matrix of Programme Mission vs. Faculty Mission

Civil Programme Mission vs. Faculty Mission
رسالة البرنامج مع الرسالة الكلية

SERIAL	Civil Programme Mission	Faculty of Engineering Mission		
		The mission of the Faculty of Engineering is to provide a broad spectrum of education and research with a British ethos,	working with UK and global partners to offer internationally recognized quality degrees that enable graduates to develop their knowledge and entrepreneurship skills	to contribute to the community development.
1	The mission of the Civil Engineering Programme is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry.	x	x	
2	To achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards.	x	x	x
3	To produce graduates who are independent learners.	x	x	x

2. Mapping matrix of Programme Mission vs. Graduates Attributes.

Attributes of Engineering Graduate vs. Programme Mission

توافق سمات / مواصفات خريجي البرنامج مع رسالة البرنامج

Attributes of Engineering Graduate (Civil Prog.)		Civil Programme Mission		
		The mission of the Civil Engineering Programme is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry.	To achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards.	To produce graduates who are independent learners.
1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;	x	x	x
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;	x	x	x
3	Behave professionally and adhere to engineering ethics and standards;		x	
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;		x	x
5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	x	x	x
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;	x	x	
7	Use techniques, skills and modern engineering tools necessary for engineering practice;	x	x	
8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;			x
9	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;	x	x	x
10	Demonstrate leadership qualities, business administration and entrepreneurial skills.	x	x	x

1a	Act professionally in design and supervision of Civil Engineering disciplines.	**x**	**x**	
2a	Use the codes of practice of all Civil Engineering disciplines effectively and professionally.	**x**	**x**	**x**
3a	Design, construct and protect all types of excavations and tunneling systems for different purposes		**x**	
4a	Manage construction sites efficiently.		**x**	**x**
5a	Select appropriate building materials from the perspective of strength, durability, suitability of use to location, temperature, weather conditions and impacts of seawater and environment.	**x**	**x**	
6a	Select and design adequate water control structures, irrigation and water networks, sewerage systems and pumping stations	**x**	**x**	
7a	Define and preserve properties (lands, real estates) of individuals, communities and institutions, through different surveying and GIS tools.	**x**	**x**	
8a	Design and construct structures for protection against dangers of unexpected natural events such as floods and storms.	**x**	**x**	
9a	Lead and supervise a group of designers and site or lab technicians.			**x**
10a	Be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality.	**x**	**x**	**x**
11a	Seek to achieve sustainable solutions to problems and have strategies for being creative, innovative and overcoming difficulties by employing their skills, knowledge and understanding in a flexible manner.	**x**	**x**	
12a	Be skilled at solving problems by applying their numerical, computational, analytical and technical skills, using appropriate tools.	**x**	**x**	
13a	Be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional responsibilities.		**x**	
14a	Be familiar with the nature of business and enterprise in the creation of economic and social value.		**x**	**x**
15a	Appreciate the global dimensions of engineering, commerce and communication.	**x**	**x**	
16a	Be able to formulate and operate within appropriate codes of conduct, when faced with an ethical issue.		**x**	**x**
17a	Be professional in their outlook, be capable of team working.		**x**	**x**

18a	Be effective communicators, and be able to exercise responsibility and sound management approaches.	**x**	**x**	**x**

3. Mapping matrix of Programme Mission to Programme Competencies

Civil Programme Mission vs. NARS Competencies 2018 رسالة البرنامج مع المعايير الأكاديمية																	
SERIAL	Civil Programme Mission	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – CIVIL ENGINEERING Specialization (B)				UK Requirements for (ARS) (C)	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	Bci4	C1	C2
1	The mission of the Civil Engineering Programme is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2	To achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards.			x			x	x	x	x						x	x
3	To produce graduates who are independent learners.										x					x	x

4. Mapping matrix of Programme Aims (Objectives) vs. Faculty Aims (Objectives)

Civil Programme Objectives vs. Faculty Strategic Objectives					
SERIAL	Faculty Strategic Objectives	Civil Programme Objectives			
		To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyse complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development.	To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Civil Engineering.	To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.	To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.
1. Teaching and Learning Objectives					
1	Develop new undergraduate programmes to support Egypt's development	X	X	X	X
2	Embed entrepreneurial skills as an integral element within all programmes	X	X	X	
3	Introduce the concept of sustainable design in all programmes		X	X	
4	Raise student intake standard			X	
5	Reward innovative and creative teaching activities	X			
6	Introduce online learner support resources relevant to programmes of study	X	X	X	
7	Convert all frequent student services to online media	X			
8	Propose alternative furniture options to allow for flexible classroom settings			X	
9	Enhance Student Support Officer role	X			
10	Develop staff and student exchange programmes				X
11	Redesign the faculty staff development programme	X			
12	Reinforce the Alumni office at the faculty			X	
13	Enhance research impact on teaching & learning			X	
14	Identify modules to be delivered in BUE London Campus.	X			

2. Research					
1	Develop new postgraduate programmes to support Egypt's development	X		X	
2	Embed entrepreneurial skills as an integral element within all postgraduate programmes			X	
3	Develop online registration application for postgraduate programmes			X	
4	Develop industrial training components within MEng postgraduate programmes			X	
5	Continue to support and expand the part-time Ph.D. scheme for the Faculty's Teaching				X
6	Assistants with UK partners				X
7	Develop Faculty-Science Park integration scheme			X	
8	Attract, develop, and support research active staff			X	
9	Attract significant research funds from external sources			X	
10	Attract UK and internationally leading figures for externally funded collaborative research activities				X
11	Attract international funding to support international events				X
12	Encourage publications in high impact research journals.			X	
3. Community Services and Enterprise					
1	Ensure suitability of offered programmes to market needs	X	X	X	X
2	Solicit industrial partners' recommendations regarding new engineering programmes		X	X	
3	Promote the establishment of start-ups for student innovations			X	
4	Design a range of informal learning platforms aimed at relevant industries			X	
5	Offer consulting services to relevant industries		X	X	
6	Develop integral scheme for Faculty-Science Park collaboration to support innovation			X	
7	Identify multi-national companies that would establish R&D offices at the Science Park			X	X
8	Expand the Industrial Linkage Platform to employ resources available through the Science Park			X	
4. Enabling Structures					
1	Strengthen and embed Governance and Leadership across the Faculty	X	X	X	X
2	Increase our sources of revenue		X		
3	Ensure that our marketing, public relations, and communications activities are targeted to meet our developing activities		X	X	
4	Support a robust programme of maintenance and upgrading for classrooms and laboratories			X	

5	**Strengthen and develop our data collection and analysis mechanisms, to inform planning and decision making.**	**X**	**X**	**X**	**X**

5. Mapping matrix of Programme Aims (Objectives) & Graduates Attributes.

Civil Programme Objectives vs. Civil Prog. Graduate Attributes اهداف البرنامج مع مواصفات الخريج للبرنامج					
SERIAL	Civil Graduate Attributes	Civil Programme Objectives			
		To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyse complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development.	To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Civil Engineering.	To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.	To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.
1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;	X	X	X	
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;	X	X	X	
3	Behave professionally and adhere to engineering ethics and standards;			X	X
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;	X	X	X	X
5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	X	X	X	
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;	X	X	X	
7	Use techniques, skills and modern engineering tools necessary for engineering practice;	X	X	X	
8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;			X	X

9	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;	**X**	**X**	**X**	
10	Demonstrate leadership qualities, business administration and entrepreneurial skills.	**X**	**X**	**X**	**X**
1a	Act professionally in design and supervision of Civil Engineering disciplines.				**X**
2a	Use the codes of practice of all Civil Engineering disciplines effectively and professionally.				**X**
3a	Design, construct and protect all types of excavations and tunnelling systems for different purposes	**X**	**X**	**X**	
4a	Manage construction sites efficiently.	**X**	**X**	**X**	
5a	Select appropriate building materials from the perspective of strength, durability, suitability of use to location, temperature, weather conditions and impacts of seawater and environment.	**X**	**X**	**X**	
6a	Select and design adequate water control structures, irrigation and water networks, sewerage systems and pumping stations	**X**	**X**	**X**	
7a	Define and preserve properties (lands, real estates) of individuals, communities and institutions, through different surveying and GIS tools.	**X**	**X**	**X**	
8a	Design and construct structures for protection against dangers of unexpected natural events such as floods and storms.	**X**	**X**	**X**	
9a	Lead and supervise a group of designers and site or lab technicians.			**X**	**X**
10a	Be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality.	**X**	**X**	**X**	
11a	Seek to achieve sustainable solutions to problems and have strategies for being creative, innovative and overcoming difficulties by employing their skills, knowledge and understanding in a flexible manner.	**X**	**X**	**X**	
12a	Be skilled at solving problems by applying their numerical, computational, analytical and technical skills, using appropriate tools.	**X**	**X**	**X**	
13a	Be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional responsibilities.	**X**	**X**	**X**	
14a	Be familiar with the nature of business and enterprise in the creation of economic and social value.			**X**	**X**
15a	Appreciate the global dimensions of engineering, commerce and communication.				**X**
16a	Be able to formulate and operate within appropriate codes of conduct, when faced with an ethical issue.				**X**
17a	Be professional in their outlook, be capable of team working.				**X**
18a	Be effective communicators, and be able to exercise responsibility and sound management approaches.	**X**	**X**	**X**	**X**

6. Mapping Matrix of Programme Aims (Objectives) vs Programme Competencies

Civil Programme Objectives vs. Programme Competencies

SERIAL	Programme Objectives	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – CIVIL ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Bci1	Bci2	Bci3	Bci4	Cci1	Cci2
1	To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyse complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Civil Engineering.	X	X	X	X	X						X	X	X	X	X	X
3	To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.										X						

7. Mapping matrix of Programme Competencies vs. Graduate Attributes

Civil Programme Attributes vs. Programme Competencies

SERIAL	Programme Attributes	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – CIVIL ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Bci1	Bci2	Bci3	Bci4	Cci1	Cci2
1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;	X	X	X	X						X	X	X	X	X	X	
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;	X	X	X	X							X	X	X	X	X	X
3	Behave professionally and adhere to engineering ethics and standards;				X						X						
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;							X									
5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;					X	X	X		X	X						
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;																
7	Use techniques, skills and modern engineering tools necessary for engineering practice;	X	X	X		X					X	X	X	X	X	X	
8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;					X					X						X
9	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;								X								

10	Demonstrate leadership qualities, business administration and entrepreneurial skills.									**X**	**X**						
1a	Act professionally in design and supervision of Civil Engineering disciplines.				**X**		**X**	**X**									
2a	Use the codes of practice of all Civil Engineering disciplines effectively and professionally.				**X**												
3a	Design, construct and protect all types of excavations and tunnelling systems for different purposes	**X**	**X**									**X**	**X**				
4a	Manage construction sites efficiently.						**X**										
5a	Select appropriate building materials from the perspective of strength, durability, suitability of use to location, temperature, weather conditions and impacts of seawater and environment.	**X**	**X**	**X**	**X**							**X**		**X**			
6a	Select and design adequate water control structures, irrigation and water networks, sewerage systems and pumping stations	**X**	**X**	**X**	**X**							**X**	**X**				
7a	Define and preserve properties (lands, real estates) of individuals, communities and institutions, through different surveying and GIS tools.											**X**					
8a	Design and construct structures for protection against dangers of unexpected natural events such as floods and storms.											**X**	**X**	**X**		**X**	
9a	Lead and supervise a group of designers and site or lab technicians.							**X**									
10a	Be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality.	**X**	**X**	**X**								**X**	**X**	**X**			
11a	Seek to achieve sustainable solutions to problems and have strategies for being creative, innovative and overcoming difficulties by employing their skills, knowledge and understanding in a flexible manner.											**X**	**X**	**X**			
12a	Be skilled at solving problems by applying their numerical, computational, analytical and technical skills, using appropriate tools.															**X**	**X**

13a	Be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional responsibilities.				**X**									**X**			
14a	Be familiar with the nature of business and enterprise in the creation of economic and social value.									**X**					**X**		
15a	Appreciate the global dimensions of engineering, commerce and communication.								**X**	**X**	**X**				**X**		
16a	Be able to formulate and operate within appropriate codes of conduct, when faced with an ethical issue.				**X**												
17a	Be professional in their outlook, be capable of team working.							**X**									
18a	Be effective communicators, and be able to exercise responsibility and sound management approaches.						**X**		**X**								

8. Mapping matrix of Courses vs. Programme Competencies (include Prep Year)

Civil Modules vs. Civil Programme Competencies																			
	SERIAL	Module	Code	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – Civil ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
				A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2
Prep Semester 1	1	Mathematics for Engineers (1)	SCIB01P	x				x				x							
	2	Introductory Physics	SCIB02P		x				x		x								
	3	Engineering Mechanics *	MECH01P	x	x			x											
	4	Chemistry for Engineers *	CHME01P		x	x				x									
	5	Introduction to Computing *	COMP01P				x						x						
	6	English for Academic Purposes	ENGENGL01								x	x	x						
	7	Engineering Ethics and Human Rights *	ENGG01P				x			x	x								
Prep Semester 2	8	Mathematics for Engineers (2)	SCIB03P	x				x				x							
	9	Electricity and Magnetism	SCIB04P		x					x	x								
	10	Algebra and Geometry *	SCIB05P	x		x		x											
	11	Engineering Drawing & Descriptive Geometry*	MECH02P			x	x				x								
	12	Production Technology I *	MECH03P			x	x	x											
	13	English and Academic Writing	ENGENGL02					x		x	x	x	x						
DY1 Semester 1	14	Construction Technology and Management	CIVL01C				x		x		x		x						
	15	Civil Engineering Drawing	CIVL02C							x	x								
	16	Surveying (1)	CIVL04C		x		x				x		x						
	17	Introduction to Construction Engineering Materials	CIVL12C	x	x	x				x	x		x	x					
	18	Rigid Body Mechanics	CIVL15C	x	x								x	x					
	19	Calculus	SCIB01C	x	x			x					x						
DY1 Semester 2	20	Research and Communication Skills	CIVL11C		x			x		x	x								
	21	Differential Equations	SCIB02C	x	x			x					x						
	22	Structural Analysis and Mechanics (1)	CIVL03C	x	x	x				X	x		x		x				
	23	Fluid Mechanics	CIVL13C	x	x			x			x			x					
	24	Soil Mechanics (1)	CIVL05C	x	x	X	X			x	x		X	x	X	X			
	25	Construction Engineering Materials (1)	CIVL06C	X	x					x	x			x	x				
DY2 Semester 1	26	Construction Engineering Materials (2)	CIVL01I		x	x	X			x	x		x	x		X			
	27	Structural Analysis and Mechanics (2)	CIVL07C	X	x					x	x	x	x	X	X				
	28	Computer Applications in Civil Engineering	CIVL09C	x	x		x			x	x		x	X	X				
	29	Hydraulics (1)	CIVL10C		x	x		x			x			X	X				
	30	Computer Aided Drafting (CAD)	CIVL14C							X	x		x						
	31	Construction Management	CIVL16I			x	X	x	x	X	x	x	x			x	x		
DY2 Semester 2	32	Numerical Methods	SCIB02I	x	x			X					x						
	33	Hydrology and Water Engineering	CIVL03I			x	x		x		x				x	x			
	34	Structural Steel Design (1)	CIVL04I		x	x	x	x	x	x	x				x	x		x	
	35	Surveying (2)	CIVL05I		x		x		x	x	x		x	X					
	36	Soil Mechanics (2)	CIVL06I		X	X	X	X		x	x			X				X	
	37	Reinforced Concrete Design (1)	CIVL07I		x	x	X	X		x	x	x	x	X	x	x		X	
	38	Industrial Training Placement (2)	ENGG03I					x	x	x	x	x	x			x	x		

DY3 Semester 1	39	Hydraulics (2)	CIVL01H		x				x	x	x				x	x			
	40	Structural Analysis and Mechanics (3)	CIVL08I		x	x				x	x		x	X				x	
	41	Water Distribution and Sewerage System	CIVL09I		x	x	x		x	x	x				x	x			
	42	Reinforced Concrete Design (2)	CIVL11I		x	x	x	x		x	x	x	x	X	x	x		x	
	43	Field Courses	CIVL15I		x			x	x	x	x		x	X					
	44	Statistics for Engineers	SCIB03I	x	x			x		x	x		x						
DY3 Semester 2	45	Transport Systems	CIVL12I			x	X		x	x	x				x				
	46	Irrigation Works Design (1)	CIVL13I			x	x		x	x	x				x	x			
	47	Water and Wastewater Treatment	CIVL14I		x	x	x		x	x	x				x	x			
	48	Structural Analysis and Mechanics (4)	CIVL02H		X	x				X	X	X	x	X	x			x	
	49	Structural Steel Design (2)	CIVL03H			x	x		x	x	x		x	X	x				
	50	Construction Contract Procedures	CIVL23H					x		X	x	x	x			x	x	x	
	51	Industrial Training Placement (2)	ENGG07H																
DY4 S1&S2	52	Individual Research Project	CIVL30H	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	53	Design Project	CIVL27H	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
DY4 Semester 1	54	Foundation Engineering	CIVL05H			x	x			x	x	x	x	x	x	x		X	
	55	Irrigation Works Design (2)	CIVL07H			x	x		x	x	x				x	x		X	
	56	Highway and Airport Engineering	CIVL08H			x			x	x	x	x	x	x	x				
	57	Pavement Design - Optional Module	CIVL15H			x			x	x	x	x	x	x	x				
	58	Earthquake Resistant Design - Optional Module	CIVL21H		x	x	x	x		X	X	X	X	x	x			x	
	59	Water Pollution Control Process - Optional Module	CIVL12H			x	x	x	x	x	x			x	x	x			
	60	Strategic Management in Construction - Optional Module	CIVL25H		x	x	x	x	x	x	X	x	x			x	x		
DY4 Semester 2	61	Project Management	CIVL09H		x	x	x	x	x	x	X	x	x			x	X		
	62	Advanced Reinforced Concrete Design	CIVL10H		x	x	x	x		x	x		x	X	x			x	
	63	Geoinformatics	CIVL04H		x					x	X		x	X					
	64	Value and Risk Management in Construction - Optional Module	CIVL26H		x	x	x	x	x	x	X	x	x			x	X		
	65	Prestressed Concrete - Optional Module	CIVL19H		x	x	x	x		x	x	x	x	X	x	x		x	
	66	Bridge Engineering - Optional Module	CIVL11H		x	x	x		x	x	x	x	x	X	x	x		x	
	67	Wastewater Reclamation and Reuse - Optional Module	CIVL13H		x	x	x	x	x	x	x	x	x	x	x	x			
	68	Transportation Planning - Optional Module	CIVL16H		x	x			x	x	x	X	X		x				

9. Teaching and Learning methods vs. Programme Competencies

Teaching and Learning Methods vs. Civil Programme Competencies																
Teaching and Learning Methods	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – Civil ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2
Interactive Lectures	x			x			x				x	x		x	x	
Research	x	x	x		x		x	x	x		x	x	x	x	x	x
Collaborative Learning (Team Project)	x	x	x	x		x	x	x	x		x	x	x	x	x	
Tutorials	x	x		x			x				x	x		x	x	
Self study	x	x	x	x			x	x		x	x	x		x	x	
Labs	x	x					x	x							x	
Others	x															

10.Assessment methods vs Programme Competencies

Assessment Methods vs. Civil Programme Competencies

Teaching and Learning Methods	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – Civil ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2
Online Group Assignment	x		x													
Listening and Note-taking	x									x						
Speaking							x	x								
Writing Assignment				x	x			x								
Writing- academic essay								x								
Online Computer Based Project	x	x	x								x				x	
Group presentation			x	x			x	x				x			x	
Group project			x	x		x	x		x		x	x	x	x	x	
Class Test 1	x		x								x	x	x	x	x	
Individual report			x	x	x		x	x		x					x	
Individual presentation			x	x	x		x	x		x					x	
Individual project			x	x	x	x	x		x	x	x	x	x	x	x	
Individual portfolio (1)								x							x	
Practical Assessment		x														
Oral Assessment	x		x					x							x	
Design Brief (Supervisor)			x	x		x	x				x				x	
Lab Report		x														
Interim Report (Panel)			x		x		x		x	x			x	x	x	x
Student's Efforts(Supervisor)			x		x		x		x	x						x
Final Submission (Panel)			x	x	x		x		x	x			x	x		x
VIVA (Panel)			x	x	x		x			x						x
Unseen Exam	x			x							x	x	x	x	x	

مواصفات برنامج هندسة وإدارة التشييد

Specifications of Construction Engineering and Management Programme

Program Description

Every successful project requires planning and coordination, as well as the proper utilization of the resources available. It was in the 19th century that construction management began to take shape to become the field it is now. The industrial revolution that began in the late 1700s acted as the impetus for the development of principles governing the project management process. Over time, construction project managers have taken advantage of technological tools to better manage construction sites. The field has grown to the point where apps and tools are now created specifically for these professionals.

Construction Engineering and Management concerns the planning and management of the construction process for different construction projects such as buildings, highways, bridges, airports, railroads, dams, and reservoirs. Construction of such projects requires knowledge of management principles, business procedures and human behaviour. Construction Engineers equipped with state-of-the-art smart tools and applications engage in the design of structures, advanced construction methods, feasibility studies, procurement and contract management, cost estimation, planning and scheduling, project controls, quality assurance and quality control, building and site layout surveys, on site material testing, concrete mix design, safety engineering, and equipment selection.

The main objective of the CEM programme at the BUE is to provide the latest-state-of-the art of basic undergraduate education required for industrial and public practices in applying the design processes in the civil engineering area to the construction engineering field and industry. Also, it helps students to grasp the idea of construction and project management or for continued education in the field of construction project and engineering management for those who want to pursue further postgraduate studies.

Career Prospects

There are many career paths and interrelated areas in the field of construction, which can progress from construction methods to construction management, with numerous other areas of interest in between. Construction management involves the overseeing, planning, designing, and budgeting of small and large-scale construction projects, and there are different paths that a career in this type of management can take.

Careers directly related to management in construction are diversified and multi-faceted, yet they include several interrelated aspects that are consistent with construction standards and principles across the board. With what is available in the field, there are numerous choices for those who love building, creating, managing, and maintaining structures. Different yet related positions that are centred on construction and management include feasibility studies, building surveying, planning and scheduling, contract management, arbitration, risk analysis, project controls, facility management, sustainability, safety management, and quality management.

1. Basic Information

1	Programme title	Construction Engineering and Management
2	Name of the final award	BSc with honours [validated by UK partner]
3	Awarding body/institution	The British University in Egypt
4	Faculty	Engineering
5	Department	Civil Engineering
6	Dean (HoD)	Prof. Maguid Hassan
7	Head of Department	Prof. Ghada El-Mahdy
8	Programme Director (PD)	Dr. Ahmed Alhady
9	Professional, Statutory and Regulatory Body Accreditation	Egyptian Engineering Syndicate
10	Date of last initial internal review and updates	March 2017
11	Approval Date to adopt NARS 2018 by: Departmental Council Faculty Council	 - 4 October 2020 - 18 January 2021

2. Programme Mission

The mission of the Construction Engineering and Management Programme in the Civil Engineering Department is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry, and to achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards, who are independent learners.

3. Programme Aims

The programme aims:

- To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyse complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development.
- To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Construction Engineering and Management.
- To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.
- To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.

4. Distinctive Features of the Programme

The BUE delivers programmes based on a British philosophy of education. This results in programmes that are very much focused on the students rather than those who deliver the material. Graduates from UK programmes typically exhibit:

- the ability to think creatively and with strong problem-solving skills.
- high level key and transferable skill sets;
- independently maintained high level of professional and subject specific as well as general technical competence;
- the ability to consider problems at a high level (i.e. to see the big picture);
- diligence and ethical working practices;
- flexibility and the ability to apply their subject-specific knowledge to fields outside of their own.

The BUE Mission is to be the leading provider of high quality UK style education in the MENA region. The University is committed to ensuring UK validation of its programmes and to ensure a student experience that is in line with UK standards. Built on top of institutional quality assurance is subject level validation and the Faculty is committed to ensuring that its UK validating partners confirm that its degree programme is in line with UK standards. An indicator of this will be the dual award of both an Egyptian BSc and a BEng from a UK university in Civil Engineering.

The Civil Engineering Department at BUE strives to provide an up-to-date technical programme, to its students, in order to provide a self-reliant construction engineer who is capable of keeping up and coping with today's and tomorrow's fast changing high tech structures and systems. The programme offers a unique set of modules and specialty areas that allow the student to develop the necessary skills and/or background for purpose.

Furthermore, we will be seeking accreditation of this degree programme with the Chartered Institute of Building (CIOB) the UK's leading professional body for this programme discipline. Accredited degree programmes are the preferred and fast track routes for those who aim to obtain the professional qualification of Chartered Engineer (CEng). For a brief overview on the requirements of the Chartered Institute of Building (CIOB) and why it is important to gain membership refer to: https://www.ciob.org.

At the time of writing, and to the best of our knowledge, this combination of academic and professional accreditation makes our programme in Construction Engineering and Management quite unique in both Egypt and the surrounding region.

5. Relevant Subject Benchmark Statements and other External and Internal Reference Points Used to achieve Programme Outcomes

To ensure that the programme complies with the requirements of relevant national and international professional institutions/bodies, and to qualify graduates to apply for memberships in respective institutions and/or gain Chartered Engineer status, the following are used as reference points to inform the programme outcomes:

- The revised UK Quality Code for Higher Education, UKSCQA/02, March 2018 - https://www.qaa.ac.uk/quality-code.
- Descriptor for a higher education qualification at level 6 on the FHEQ; bachelor's degree with honours. UK Quality Code for Higher Education Part A: Setting and Maintaining Academic Standards Part A, The Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies, QAA, October 2014 - https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf
- Annex D: Outcome classification descriptions for FHEQ Level 6 and FQHEIS Level 10 degrees, QAA, 2019 - https://www.qaa.ac.uk/docs/qaa/quality-code/annex-d-outcome-classification-descriptions-for-fheq-level-6-and-fqheis-level-10-degrees.pdf?sfvrsn=824c981_10
- SEEC Credit Level Descriptors for Higher Education, SEEC, 2016 - http://www.seec.org.uk/wp-content/uploads/2016/07/SEEC-descriptors-2016.pdf
- QAA Subject benchmark statements: Subject Land, Construction, Real Estate and Surveying October 2019 - https://www.qaa.ac.uk/quality-code/subject-benchmark-statements
- QAA guidelines for preparing programme specifications *http://www.qaa.ac.uk/academicinfrastructure/programmeSpec/default.asp*.CIOB (Chartered Institute of Building) *http://www.ciob.org.uk/*
- *QAA Subject Benchmark Statements: Engineering, March 2023* Subject Benchmark Statement: Engineering (qaa.ac.uk)
- *Engineering Council Accreditation of Higher Education Programmes: UK Standard for Professional Engineering Competence - UK SPEC 3rd Edition - http://www.engc.org.uk/UKSPEC*
- The Construction Engineering and Management programme originally adopted NARS 2009 and upon the issuing of national Academic Reference Standards (NARS 2018 for Engineering 2nd edition), the programme performed a gap analysis with additional action plan to bridge all gaps if any. Hence, the programme specification is updated to comply with National Academic Reference Standards (NARS 2018) developed by The National Authority of Quality Assurance and Accreditation of Education (NAQAAE), https://admin.naqaae.eg/api/v1/archive/download/34733).

6. Graduate Attributes

The creative way of approaching all engineering challenges is being seen increasingly as a 'way of thinking' which is generic across all disciplines. The Construction Engineering and Management Programme adopted the NARS 2018 attributes for Engineering and Civil Engineering. The graduates of Civil Engineering should have the ability to:

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.
2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.
3. Behave professionally and adhere to engineering ethics and standards.
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.
7. Use techniques, skills, and modern engineering tools necessary for engineering practice.
8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.
9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.

In addition to the general attributes of engineer, the construction engineer must be able to:

- Personal attributes such as adaptability, self-motivation, self-management, cultural awareness, honesty, and integrity.
- Functional skills such as effective use of language, numbers, and IT.
- Personal skills such as problem-solving, teamwork, understanding the organization, leadership, and innovation.

University Requirements

The university is considered a core of Human Thinking at its highest level, and the source of investment and development of human resources. It is concerned with the rise of the Arabian Civilization and the Historical Heritage of the Egyptian Society, and its traditions. It is also concerned with the education of Religion, Morals and Nationalism (Egyptian National Law for Universities, Law 49 for Year 1972). Therefore, BUE graduates should be able to or aware of:

- National, regional, and international contemporary issues, to have an intellectual and enlightened personality and to interact effectively in the community through different communication skills.
- To achieve this goal, BUE has designed several courses planned to build the student personality, develop his/her skills, and increase his/her awareness of different topics. These courses are listed in Table 6 for the CEM Programme.

Faculty Requirements

The Construction Engineering and Management programme offered at the Faculty of Engineering, the British University in Egypt, is an Engineering Programme. The graduates have the privilege of being Engineers and are automatically enrolled in the Egyptian Engineering Syndicate (EES). The graduates are also entitled to take the Fundamentals of Engineering Exam offered by the National Council of Examiners for Engineering and Surveying (NCEES), based on the agreement between EES and NCEES.

Competencies for Engineering Graduates

According to the **National Academic Reference Standards (NARS-2018),** the **Engineering Graduate must be able to (A-Level):**

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.

A2. Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.

A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.

A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.

A5. Practice research techniques and methods of investigation as an inherent part of learning.

A6. Plan, supervise and monitor implementation of engineering projects.

A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.

A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

A9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.

A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

- Courses required to achieve these competencies (A-level) are listed in Table 7 for the CEM Program.

Discipline Requirements (Construction Engineering and Management Requirements)

According to the National Academic Reference Standards (NARS-2018), each Construction Engineering and Management graduate must meet specific competencies. Thus, in addition to the Competencies of all Engineering Programmes (A-Level), the Civil Engineering graduate must be able to (B-Level):

B.1. Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.

B.2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbours; or any other emerging field relevant to the discipline.

B.3. Plan and manage construction processes, address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects;

B.4. Deal with biddings, contracts and financial issues including project insurance and guarantees.

- Courses required to achieve these competencies (B-level) are listed in Table 8 for the CEM Programme.

Programme Competencies for UK Requirements:

The Construction Engineering and Management Programme adopted the National Reference Standards (NARS) issued in 2018 at the level of competencies (A & B) considering A as general competencies for all engineers and B as specialized competencies for civil engineering as the closest discipline to construction engineering and management.

In order to meet the advanced programme which is considered as an essential requirement for the British Partner and QAA, the Programme also adopted (ARS) at the level of (C) for professional engineering competencies.

C1 specifies an advanced modern knowledge of software packages and smart systems. which is a higher level of practice than basic knowledge and skills given in B Competencies. C2 covers writing a dissertation and possibly publishing research work that is a higher level of research than "Practice research techniques and methods of investigation as an inherent part of learning" as given in A5 competency. Also, the program requires the writing of a dissertation as part of the research graduation project.

Accordingly, the Construction Engineering and Management Programme graduate must be able to:

C.1. Acquire modern knowledge, model, and apply advanced software packages and smart systems to solve complex construction problems utilizing optimization, simulation, and heuristic modelling techniques.

C.2. Conduct research and write a dissertation on any topic related to construction management, smart systems and cities, building information modelling, and UN sustainable development goals.

- Courses required to achieve these competencies (C-level) are listed in Table 9 for the CEM Programme.

7. Programme Structure, Levels, Modules, Credits and Awards.

Credit Point System

- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) to be awarded a UK validated degree. This is in addition to the specialist courses (modules) and other requirements of the Egyptian Supreme Council of Universities required for the Egyptian degree.
- The programme is divided into teaching units called modules (courses), which are each assigned a credit weighting.
- Each module (course) is assigned a Level, number of credits and weighting, this reflects the depth of learning required in the relevant programme year.
- A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 36 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study, and assessment.
- Students study modules (courses) with a combined weight of 120 credit points in each year (60 credit points per semester)

- Modules (courses) that are delivered in one semester have their assessment completed within the semester in which they are taught. The programme is structured such that formal examinations can take place at the end of each semester.

Academic Semesters

- The academic year is divided into two semesters: Semester 1 and Semester 2.
- Each semester is 15-weeks in length.
- Week 13 being a revision week, and weeks 14- 15 being assessment weeks at the end of each semester.
- The Academic year includes a summer assessment period where students can resit-failed modules (courses).

Programme Levels

- The whole programme, of total 600 credit points, is divided into four levels P, C, I and H (120 for P and 160 for each of C, I and H), according to the Framework for Higher Education Qualifications of UK Degree-Awarding Bodies.
- These levels reflect the depth of learning required in the relevant programme year.
- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) of the UK Degree-Awarding Bodies to be awarded a UK validated degree, in addition to the Egyptian degree.
- Each programme is also divided into **four levels of competencies, as per the NARS 2018**, as follows:
    - Level (0) university requirements
    - Level (A) Faculty requirements
    - Level (B) Discipline requirements
    - Level (C) Programme requirements

Duration of Study

- The duration of Study is five years (10 semesters) including a Preparatory Year.

Programme Structure

- All taught undergraduate programmes at BUE are modular in structure.
- The Construction Engineering and Management Programme is assigned as a credit weighting. A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 35 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study, and assessment. The maximum credit weighting for any one module is normally 20 credits.
- Modules that are delivered over two semesters have 20-50% of their assessment completed in semester one and the remainder in semester two, with formal examinations (where applicable) taking place in weeks 14 to 15 of semester two.

8. Conformity of the Construction Engineering and Management Programme to Supreme Council of Universities (SCU) Guidelines

The SCU guidelines consists of seven major categories that run throughout the whole programme; namely: Human and Social Sciences; Mathematics and Basic Science, Basic Engineering Science, Applied Engineering Sciences, Computer Applications and ICT, Projects and Practice and Discretionary (Institution character- identifying) Subject with range of weights of [9-12%], [20-26%], [20-23%], [20-22%], [9-11%], [8-11%], and [6-8%] respectively. The credits contribution, of the major categories in the Construction Engineering and Management programme is presented as follows:

Table 4 Indicative Curricula Content by Subject Area

Total no. of hrs / programme = 600										
Curricula Content by Subject Area		Number of Courses	No of Course / levels					Total no. of hrs / subject area	% of subject area	Total % of NARS
			Prep year	DY1 (hrs)	DY2 (hrs)	DY3 (hrs)	DY4 (hrs)			
A	Humanities and social Science	7	3	-	2	1	1	65	11%	9-12
B	Mathematics and Basic Science	12	7	3	1	1	-	120	20%	20-26
C	Basic Engineering Science	13	2	5	4	2	-	130	22%	20-23
D	Applied Engineering and Design	13	-	-	3	6	4	130	22%	20-22
E	Computer Applications and ICT	6	1	1	1	1	2	55	9%	9-11
F	Projects and Practice	5	-	1	1	1	2	50	8%	8-11
G	Discretionary (Institution character-identifying) Subject	5	-	2	-	-	3	50	8%	6-8

Total no. of hrs / programme = 600										
Curricula Content by Subject Area		Number of Courses	No of Course / levels					Total no. of hrs / subject area	% of subject area	Total % of NARS
			Prep year	DY1 (hrs)	DY2 (hrs)	DY3 (hrs)	DY4 (hrs)			
	Total No. of hrs /DY		120	120	120	120	120	600		

Table 5 Major Categories of the CEM Programme

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
University Requirements										
Prep	ENGENG L01	English for Academic Purposes	10	X						
Prep	ENGG01P	Engineering Ethics and Human Rights	5	X						
Prep	ENGENG L02	English and Academic Writing	10	X						
1	CEM11C	Research and Communication Skills	10					X		
3	CEM23H	Construction Contract Procedures	10	X						
	Level A	**Faculty Requirements**								
Prep	MECH01P	Engineering Mechanics	10		X					
Prep	MECH02P	Engineering Drawing & Descriptive Geometry	10			X				
Prep	SCIB01P	Mathematics for Engineers (1)	10		X					
Prep	COMP01P	Introduction to Computing	5					X		
Prep	SCIB02P	Introductory Physics	10		X					
Prep	CHME01P	Chemistry for Engineers	10		X					
Prep	SCIB03P	Mathematics for Engineers (2)	10		X					
Prep	SCIB04P	Electricity and Magnetism	10		X					

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
Prep	SCIB05P	Algebra and Geometry	10		X					
Prep	MECH03P	Production Technology I	10			X				
1	CEM02C	Engineering Drawing	10							X
1	SCIB01C	Calculus	10		X					
1	SCIB02C	Differential Equations	10		X					
2	SCIB03I	Statistics for Engineers	10		X					
	Level B	**Discipline Requirements**								
1	CEM01C	Construction Technology and Management	10							X
1	CEM03C	Structural Analysis and Mechanics (1)	10			X				
1	CEM04C	Geometrics in Surveying	10						X	
1	CEM05C	Geotechnics and Engineering Geology	10			X				
1	CEM06C	Construction Engineering Materials (1)	10			X				
1	CEM12C	Introduction to Construction Engineering Materials	10			X				
1	CEM13C	Fluid Mechanics	10		X					
2	CEM07C	Structural Analysis and Mechanics (2)	10			X				
2	CEM09C	Computer Applications in Construction	10					X		
2	CEM10C	Hydraulics	10			X				
2	CEM16C	Law in Construction	10	X						
2	CEM02I	Construction Equipment	10				X			
2	CEM04I	Structural Steel Design (1)	10				X			
2	CEM05I	Geomatics	10						X	
2	CEM06I	Geotechnics	10			X				
2	CEM07I	Reinforced Concrete Design (1)	10				X			

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
2	CEM10I	Quantity Surveying, Estimation, and Specifications	10			X				
2	CEM17I	Principles of Management	10	X						
3	CEM09I	Water Distribution & Sewerage Systems	10				X			
3	CEM11I	Reinforced Concrete Design (2)	10				X			
3	CEM12I	Transport Systems	10			X				
3	CEM13I	Irrigation Works Design (1)	10				X			
3	CEM14I	Water & Wastewater Treatment	10				X			
3	CEM05H	Foundation Engineering	10				X			
3	CEM03H	Structural Steel Design (2)	10				X			
	Level C	**Programme Requirements**								
1	CEM08C	Building Services	10			X				
3	CEM18I	Construction Economics & Financial Management	10		X					
3	CEM19I	Management Information Systems	10			X				
3	CEM20I	Construction Planning and Scheduling	10					X		
3	CEM09H	Project Management	10						X	
4	CEM25H	Strategic Management in Construction	10				X			
4	CEM26H	Value and Risk Management in Construction	10					X		
4	CEM28H	Rehabilitation and Retrofitting of Structures	10				X			
4	CEM29H	Human Resources Management in Construction	10	X						
4	CEM31H	Lean Construction	10					X		
4	CEM32H	Sustainability & the Built Environment	10							X

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
4	CEM27H	Group Construction Project	20						X	
4	CEM30H	Individual Research Project	20							X
4		Elective Course 1	10				X			
4		Elective Course 2	10				X			
		Elective Courses								
4	CEM04H	Geoinformatics	10				X			
4	CEM07H	Advanced Irrigation Works	10				X			
4	CEM08H	Highway and Airport Engineering	10				X			
4	CEM10H	Advanced Reinforced Concrete Design	10				X			
4	CEM11H	Bridge Engineering	10				X			
4	CEM15H	Pavement Design	10				X			
4	CEM16H	Transportation Planning	10				X			
4	CEM19H	Pre-stressed Concrete	10				X			
4	CIVL21H	Earthquake Resistant Design	10				X			
		Total	600	65	120	130	130	55	50	50
		%	100	11	20	22	22	9	8	8

CEM Programme Courses

Courses required to achieve University Requirements

Table 6 List of University requirements courses.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
ENGENGL01	English for Academic Purposes	10	0	4	0	4
ENGENGL02	English and Academic Writing	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights	5	2	0	0	2
CEM11C	Research and Communication Skills	10	2	1	0	3
CEM23H	Construction Contract Procedures	10	2	1	0	3
Total University requirements		**45**	**6**	**10**	**0**	**16**

Courses Required to achieve the General Competencies of A-level (Faculty Requirements)

A set of courses must be completed as a Faculty Requirement. These courses are divided into Basic Science Courses and Basic Engineering Courses.

Table 7 List of Faculty requirements courses.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry	10	2	2	0	4
MECH01P	Engineering Mechanics	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry	10	2	3	0	5
MECH03P	Production Technology I	10	2	2	0	4
CHME01P	Chemistry for Engineers	10	2	1	2	5
COMP01P	Introduction to Computing	5	2	0	2	4
CEM02C	Engineering Drawing	10	1	2	0	3
SCIB01C	Calculus	10	2	2	0	4
SCIB02C	Differential Equations	10	2	2	0	4
SCIB03I	Statistics for Engineers	10	2	2	0	4
ENGG03I	Industrial Training Placement (1)	0	0	0	0	0
ENGG07H	Industrial Training Placement (2)	0	0	0	0	0
Total Faculty Requirements		**135**	**27**	**24**	**8**	**59**

Courses Required to achieve Construction Engineering and Management Requirements of B-level (Discipline Requirements):

A set of courses must be completed as a Basic Civil Engineering Requirements, in the Construction Engineering and Management Programme.

Table 8 List of Discipline requirements courses (Construction Engineering and Management)

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CEM01C	Construction Technology and Management	10	2	1	1.3	4.3
CEM03C	Structural Analysis and Mechanics (1)	10	2	2	0	4
CEM04C	Geometrics in Surveying	10	2	1	0	3
CEM12C	Introduction to Construction Engineering Materials	10	2	1.3	0.7	4
CEM05C	Geotechnics & Engineering Geometry	10	2	0.7	0.3	3
CEM06C	Construction Engineering Materials (1)	10	2	1.3	0.7	4
CEM13C	Fluid Mechanics	10	2	0.7	0.3	3
CEM07C	Structural Analysis and Mechanics (2)	10	2	2	0	4
CEM09C	Computer Applications in Construction	10	1	0	2	3
CEM10C	Hydraulics	10	2	0.7	0.3	3
CEM16C	Law in Construction	10	2	1	0	3
CEM02I	Construction Equipment	10	2	1	0	3
CEM04I	Structural Steel Design (1)	10	2	2	0	4
CEM05I	Geomatics	10	2	0.5	0.5	3
CEM06I	Geotechnics	10	2	0.7	0.3	3
CEM07I	Reinforced Concrete Design (1)	10	2	2	0	4
CEM09I	Water Distribution & Sewerage Systems	10	2	1	0	3
CEM10I	Quantity Surveying, Estimation and Specifications	10	2	1	0	3
CEM11I	Reinforced Concrete Design (2)	10	2	2	0	4
CEM12I	Transport Systems	10	2	1	0	3
CEM13I	Irrigation Works Design (1)	10	2	1	0	3
CEM14I	Water & Wastewater Treatment	10	2	0.75	0.25	3
CEM17I	Principles of Management	10	2	1	0	3
CEM05H	Foundation Engineering	10	2	2	0	4
CEM03H	Structural Steel Design (2)	10	2	2	0	4
Total		250	49	29.7	6.7	85.3

Courses Required to achieve the Competencies of C-level (Programme Competencies for Major Requirements):

Courses Required to get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed:

Table 9 List of Discipline requirements courses (Construction Engineering and Management)

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	University Requirements	**45**	**6**	**10**	**0**	**16**
	Faculty of Engineering Requirements	**135**	**27**	**24**	**8**	**59**
	Discipline Civil Engineering Requirement	250	49	29.7	6.7	85.3
University + Faculty + Discipline Requirements Total		430	82	63.7	14.7	160.3
	Programme Requirements					
CEM08C	Building Services	10	2	1	0	3
CEM18I	Construction Economics & Financial Management	10	2	1	0	3
CEM19I	Management Information Systems	10	2	1	0	3
CEM20I	Construction Planning & Scheduling	10	2	1	0	3
CEM09H	Project Management	10	2	1	0	3
CEM25H	Strategic Management in Construction	10	2	1	0	3
CEM26H	Value & Risk Management in Construction	10	2	1	0	3
CEM28H	Rehabilitation and Retrofitting of Structures	10	2	1	0	3
CEM29H	Human Resource Management in Construction	10	2	1	0	3
CEM31H	Lean Construction	10	2	1	0	3
CEM32H	Sustainability and the Built Environment	10	2	1	0	3
CEM27H	Group Construction Project	20	0	1	0	1
CEM30H	Individual Research Project	20	0	1	0	1
CIVLXXH	Elective Course 1	10	2	1	0	3
CIVLXXH	Elective Course 2	10	2	1	0	3
Programme Requirements Total		170	26	15	0	41
Construction Engineering Programme Requirements Total		600	108	78.7	14.7	201.3

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 1 of Elective Courses						
DY4 - Semester (1)						
CEM07H	Irrigation Works Design (2)	10	2	1	0	3
CEM08H	Highway and Airport Engineering	10	2	1	0	3
CEM15H	Pavement Design	10	2	1	0	3
CEM21H	Earthquake Resistant Design	10	2	1	0	3

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 2 of Elective Courses						
DY4 - Semester (2)						
CEM04H	Geoinformatics	10	2	0.5	0.5	3
CEM10H	Advanced Reinforced Concrete Design	10	2	2	0	4
CEM11H	Bridge Engineering	10	2	1	0	3
CEM16H	Transportation Planning	10	2	1	0	3
CEM19H	Pre-stressed Concrete	10	2	1	0	3

Proposed Study Plan – CEM Programme

To get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Preparatory Year - Semester (1)						
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
MECH01P	Engineering Mechanics *	10	2	2	0	4
CHME01P	Chemistry for Engineers *	10	2	1	2	5
COMP01P	Introduction to Computing *	5	2	0	2	4
ENGENGL01	English for Academic Purposes	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights *	5	2	0	0	2
Total		60	12	10	6	28

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Preparatory Year - Semester (2)						
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry *	10	2	2	0	4
MECH02P	Engineering Drawing & Descriptive Geometry*	10	2	3	0	5
MECH03P	Production Technology I *	10	2	2	0	4
ENGENGL02	English and Academic Writing	10	0	4	0	4
Total		60	10	14	2	26

*** Modules that are taught to half the cohort in semester one and the other half in semester two.**

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
DY1 - Semester (1)						
CEM01C	Construction Technology and Management	10	2	1	1.3	4.3
CEM02C	Engineering Drawing	10	1	2	0	3
CEM04C	Geometrics in Surveying	10	2	1	0	3
CEM08C	Building Services	10	2	1	0	3
CEM12C	Introduction to Construction Engineering Materials	10	2	1.3	0.7	4
SCIB01C	Calculus	10	2	2	0	4
Total		60	11	8.3	2	21.3

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY1 - Semester (2)					
CEM03C	Structural Analysis and Mechanics (1)	10	2	2	0	4
CEM05C	Geotechnics and Engineering Geology	10	2	0.7	0.3	3
CEM06C	Construction Engineering Materials (1)	10	2	1.3	0.7	4
CEM11C	Research and Communication Skills	10	2	1	0	3
CEM13C	Fluid Mechanics	10	2	0.7	0.3	3
SCIB02C	Differential Equations	10	2	2	0	4
Total		60	12	7.7	1.3	21

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 - Semester (1)					
CEM07C	Structural Analysis and Mechanics (2)	10	2	2	0	4
CEM10C	Hydraulics (1)	10	2	0.7	0.3	3
SCIB03I	Statistics for Engineers	10	2	2	0	4
CEM09C	Computer Applications in Construction	10	1	0	2	3
CEM17I	Principles of Management	10	2	1	0	3
CIVL16C	Law in Construction	10	2	1	0	3
Total		60	11	6.7	2.3	20

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 - Semester (2)					
CEM10I	Quantity Surveying, Estimation and Specifications	10	2	1	0	3
CEM10I	Construction Equipment	10	2	1	0	3
CEML04I	Structural Steel Design (1)	10	2	2	0	4
CEM06I	Geotechnics	10	2	0.7	0.3	3
CEM07I	Reinforced Concrete Design (1)	10	2	2	0	4
CEM05I	Geomatics	10	2	0.5	0.5	3
Total		60	12	7.2	0.8	20

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 – Summer Semester					
ENGG03I	Industrial Training Placement (1)	0	0	0	0	200

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
DY3 - Semester (1)						
CEM05H	Foundation Engineering	10	2	2	0	4
CEM09I	Water Distribution & Sewerage Systems	10	2	1	0	3
CEM11I	Reinforced Concrete Design (2)	10	2	2	0	4
CEM18I	Construction Economics & Financial Management	10	2	1	0	3
CEM19I	Management Information Systems	10	2	1	0	3
CEM20I	Construction Planning & Scheduling	10	2	1	0	3
Total		60	12	8	0	20

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
DY3 - Semester (2)						
CEM23H	Construction Contract Procedures	10	2	1	0	3
CEM12I	Transport Systems	10	2	1	0	3
CEM13I	Irrigation Works Design (1)	10	2	1	0	3
CEM14I	Water & Wastewater Treatment	10	2	0.75	0.25	3
CEM09H	Project Management	10	2	1	0	3
CEM03H	Structural Steel Design (2)	10	2	2	0	4
Total		60	12	6.75	0.25	19

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
DY3 – Summer Semester						
ENGG07H	Industrial Training Placement (2)	0	0	0	0	200

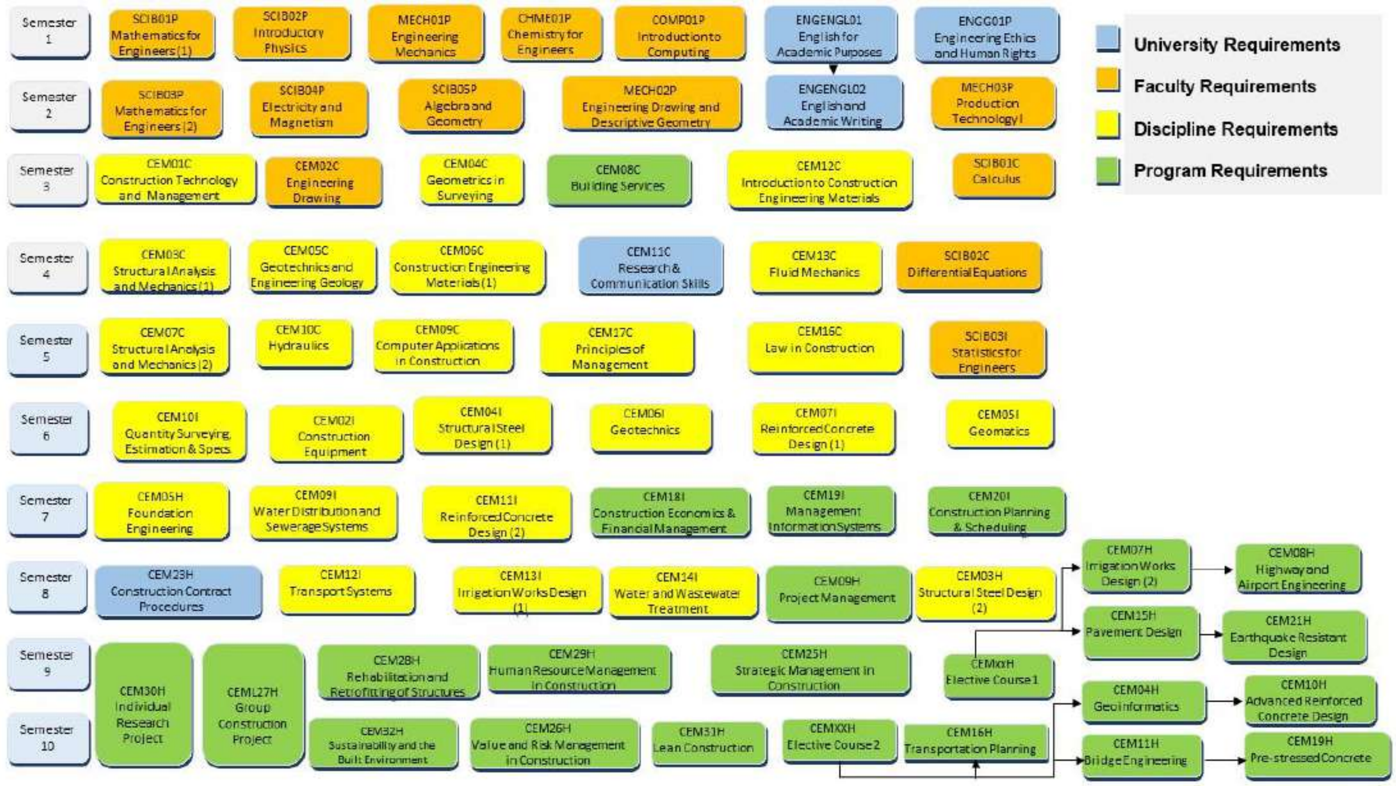
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
DY4 - Semester (1)						
CEM30H	Individual Research Project	10	0	0.5	0	0.5
CEM27H	Group Construction Project	10	0	0.5	0	0.5
CEM28H	Rehabilitation and Retrofitting of Structures	10	2	1	0	3
CEM29H	Human Resource Management in Construction	10	2	1	0	3
CEM25H	Strategic Management in Construction	10	2	1	0	3
CIVLXXH	Elective Course 1	10	2	1	0	3
Total		60	8	5	0	13

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY4 - Semester (2)					
CEM30H	Individual Research Project	10	0	0.5	0	0.5
CEM27H	Group Construction Project	10	0	0.5	0	0.5
CEM32H	Sustainability and the Built Environment	10	2	1	0	3
CEM31H	Lean Construction	10	2	1	0	3
CEM26H	Value & Risk Management in Construction	10	2	1	0	3
CIVLXXH	Elective Course 2	10	2	1	0	3
Total		60	8	5	0	13

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 1 of Elective Courses						
	DY4 - Semester (1)					
CEM07H	Irrigation Works Design (2)	10	2	1	0	3
CEM08H	Highway and Airport Engineering	10	2	1	0	3
CEM15H	Pavement Design	10	2	1	0	3
CEM21H	Earthquake Resistant Design	10	2	1	0	3

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 2 of Elective Courses						
	DY4 - Semester (2)					
CEM04H	Geoinformatics	10	2	0.5	0.5	3
CEM10H	Advanced Reinforced Concrete Design	10	2	2	0	4
CEM11H	Bridge Engineering	10	2	1	0	3
CEM16H	Transportation Planning	10	2	1	0	3

Programme Courses Tree –CEM Programme



9. An Overview of Teaching, Learning and Assessment Strategies to Enable Competencies to be Achieved and Demonstrated

A. Learning and Teaching Methods

Throughout the programme students are encouraged to undertake independent reading both to supplement and consolidate what is being taught and to broaden, develop and reinforce their competencies throughout the programme. Targeted delivery may come from a variety of sources such as

1. Lectures.
2. Tutorials.
3. problem solving classes.
4. laboratory exercises.
5. coursework exercises and self-study and particularly through project work undertaken both in groups and individually.

Further support is gained through study skills delivered as a matter of policy within both the English language programme and individual modules.

10. Support for Learning

- All resources needed for the modules (Courses) are updated and uploaded on the E-Learning https://learn1.bue.edu.eg/ .
- The tutorials are designed by the module leaders (course leader) to ensure a strong link with module contents to provide students with useful, challenging, good support & practice for the material discussed in lectures.
- Students are provided with feedback related to their submissions within two weeks of submissions.
- For assessed work, feedback is provided in the form of individual written feedback on coursework and as a discussion during tutorials.
- For developmental work, feedback is delivered in the form of dialogue between students and staff in tutorials as well as individual feedback provided in tutorials.
- Weaker students are supported with additional remedial classes and clinics during office hours to uplift their performance.
- A generic exam feedback is developed and posted on E-learning after releasing scripts to students each semester. Students will be notified via e-mail once generic feedback is uploaded.
- Institutional services including the Library, Welfare Counsellor, Faculty services including a Student Support Officer and Programme Handbook.

B. Assessment

Competencies are tested and assessed throughout the programme using a variety of forms that typically include a combination of

1. Unseen written examinations.
2. Computer aided assessments.
3. Coursework assignments.
4. Project reports and/or papers.
5. Oral presentations.
6. Visual presentations.

Coursework forms a particularly important part of the assessment. This method of assessment can

(i) be used to strongly motivate independent learning.
(ii) improve student planning and time management skills and
(iii) to develop the comprehension and usage of technical English (particularly important for students at the BUE).

Examinations show how well the student can demonstrate their mastery of an area of scholarly knowledge by selecting appropriate material from memory and applying it to an unseen question in a limited time period. Coursework allows the student to demonstrate wider academic skill of focused scholarly research, drafting, editing and polished writing.

Applied skills are tested and assessed throughout the programme using a combination of coursework assignments, design studies, laboratory logbooks, project reports and/or papers, project logbooks and work placement reports.

11. Crisis and Disaster Management

The faculty of Engineering manages crisis and disaster through the following:

1. Crisis and Disaster Committee
2. Contingency Plan
3. Health and Safety
4. Contact Trees

12. Entry Requirements

In addition to the requirements listed in Part-B, students are required to successfully complete of the Engineering Preparatory Year and passing the entry exam which evaluates student's abilities and architectural skills.

Other admission routes may be considered in accordance with the University's regulations as defined in the Undergraduate Academic Regulations.

13. Quality Assurance and Programme Enhancement

- In accordance with the University's Quality Assurance procedures, as defined in the Annual Quality Assurance and Enhancement Cycle.
- Feedback on all aspects of this programme will be obtained via standard procedures from the University's framework for quality assurance, as defined in the Annual Quality and Enhancement Cycle.

14. Programme Management

- Head of Department
- Programme Director

The programme management is mainly carried out by the HoD. However, the main task of the PD is to monitor the sound delivery of the programme, and the maintenance of academic standards and quality, in line with the University's Strategic Plan for Teaching and Learning.

In addition to the previous, monthly Departmental meetings are carried out with all department's staff members. Related issues are raised for in-depth analysis and discussion to the FTLC that in turn raises with the UTLC and Senate for final decision.

15. Appendices

1. Mapping Matrix of Programme Mission vs. Faculty Mission

CEM Programme Mission vs. Faculty Mission رسالة البرنامج مع الرسالة الكلية				
SERIAL	CEM Programme Mission	Faculty of Engineering Mission		
		The mission of the Faculty of Engineering is to provide a broad spectrum of education and research with a British ethos,	working with UK and global partners to offer internationally recognized quality degrees that enable graduates to develop their knowledge and entrepreneurship skills	to contribute to the community development.
1	The mission of the Construction Engineering and Management Programme is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry.	x	x	
2	To achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards.		x	x
3	To produce graduates who are independent learners.		x	x

2. Mapping Matrix of Programme Mission vs. Graduates Attributes.

Attributes of Engineering Graduate vs. Programme Mission توافق سمات / مواصفات خريجي البرنامج مع رسالة البرنامج				
Attributes of Engineering Graduate (CEM Prog.)		CEM Programme Mission		
		1. The mission of the Construction Engineering and Management Programme is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry.	2. To achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards.	3. To produce graduates who are independent learners.
1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;	x	x	x
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;	x	x	x
3	Behave professionally and adhere to engineering ethics and standards;		x	
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;		x	
5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	x	x	
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;		x	
7	Use techniques, skills and modern engineering tools necessary for engineering practice;	x		
8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;			x

9	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;	**x**	**x**	
10	Demonstrate leadership qualities, business administration and entrepreneurial skills.	**x**	**x**	
1a	Personal attributes such as adaptability, self-motivation, self-management, cultural awareness, honesty, and integrity.	**x**	**x**	**x**
2a	Functional skills such as effective use of language, numbers, and IT.	**x**	**x**	**x**
3a	Personal skills such as problem-solving, team work, understanding the organization, leadership, and innovation.	**x**	**x**	**x**

3. Mapping matrix of Programme Mission to Programme Competencies

CEM Programme Mission vs. NARS Competencies 2018

رسالة البرنامج مع المعايير الأكاديمية

SERIAL	CEM Programme Mission	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – CIVIL ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2
1	The mission of the Construction Engineering and Management Programme is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2	To achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards.			x			x	x	x	x						x	x
3	To produce graduates who are independent learners.										x						

4. Mapping Matrix of Programme Aims (Objectives) vs. Faculty Aims (Objectives)

CEM Programme Objectives vs. Faculty Strategic Objectives					
SERIAL	Faculty Strategic Objectives	CEM Programme Objectives			
		1. To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyze complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development	2. To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Construction Engineering and Management.	3. To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.	To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.
1. Teaching and Learning Objectives					
1	Develop new undergraduate programmes to support Egypt's development	X	X	X	X
2	Embed entrepreneurial skills as an integral element within all programmes	X	X	X	
3	Introduce the concept of sustainable design in all programmes		X	X	
4	Raise student intake standard			X	
5	Reward innovative and creative teaching activities	X			
6	Introduce online learner support resources relevant to programmes of study	X	X	X	
7	Convert all frequent student services to online media	X			
8	Propose alternative furniture options to allow for flexible classroom settings			X	
9	Enhance Student Support Officer role	X			
10	Develop staff and student exchange programmes				X
11	Redesign the faculty staff development programme	X			
12	Reinforce the Alumni office at the faculty			X	
13	Enhance research impact on teaching & learning			X	
14	Identify modules to be delivered in BUE London Campus.	X			
2. Research					
1	Develop new postgraduate programmes to support Egypt's development	X		X	
2	Embed entrepreneurial skills as an integral element within all postgraduate programmes			X	
3	Develop online registration application for postgraduate programmes			X	
4	Develop industrial training components within MEng postgraduate programmes			X	
5	Continue to support and expand the part-time Ph.D. scheme for the Faculty's Teaching				X

6	Assistants with UK partners				X
7	Develop Faculty-Science Park integration scheme			X	
8	Attract, develop, and support research active staff			X	
9	Attract significant research funds from external sources			X	
10	Attract UK and internationally leading figures for externally funded collaborative research activities				X
11	Attract international funding to support international events				X
12	Encourage publications in high impact research journals.			X	
3. Community Services and Enterprise					
1	Ensure suitability of offered programmes to market needs	X	X	X	X
2	Solicit industrial partners' recommendations regarding new engineering programmes		X	X	
3	Promote the establishment of start-ups for student innovations			X	
4	Design a range of informal learning platforms aimed at relevant industries			X	
5	Offer consulting services to relevant industries		X	X	
6	Develop integral scheme for Faculty-Science Park collaboration to support innovation			X	
7	Identify multi-national companies that would establish R&D offices at the Science Park			X	X
8	Expand the Industrial Linkage Platform to employ resources available through the Science Park			X	
4. Enabling Structures					
1	Strengthen and embed Governance and Leadership across the Faculty	X	X	X	X
2	Increase our sources of revenue		X		
3	Ensure that our marketing, public relations, and communications activities are targeted to meet our developing activities		X	X	
4	Support a robust programme of maintenance and upgrading for classrooms and laboratories			X	
5	Strengthen and develop our data collection and analysis mechanisms, to inform planning and decision making.	X	X	X	X

5. Mapping matrix of Programme Aims (Objectives) & Graduates Attributes.

CEM Programme Objectives vs. CEM Prog. Graduate Attributes
اهداف البرنامج مع مواصفات الخريج للبرنامج

SERIAL	CEM Graduate Attributes	CEM Programme Objectives: 1. To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyse complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development.	2. To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Construction Engineering and Management.	3. To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.	4. To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.
1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;	X	X	X	
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;	X	X	X	
3	Behave professionally and adhere to engineering ethics and standards;				X
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;	X	X	X	X
5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	X	X	X	
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;	X	X	X	
7	Use techniques, skills and modern engineering tools necessary for engineering practice;	X	X	X	
8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post-graduate and research studies;				X

9	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;	**X**	**X**	**X**	
10	Demonstrate leadership qualities, business administration and entrepreneurial skills.	**X**	**X**	**X**	**X**
1a	Personal attributes such as adaptability, self-motivation, self-management, cultural awareness, honesty, and integrity.	**X**	**X**	**X**	**X**
2a	Functional skills such as effective use of language, numbers, and IT.	**X**	**X**	**X**	**X**
3a	Personal skills such as problem-solving, team work, understanding the organization, leadership, and innovation.	**X**	**X**	**X**	**X**

6. Mapping Matrix of Programme Aims (Objectives) vs Programme Competencies

CEM Programme Objectives vs. Programme Competencies																	
SERIAL	CEM Programme Objectives	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – CIVIL ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2
1	To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyse complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Construction Engineering and Managment.	X	X	X	X	X						X	X	X	X	X	X
3	To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.										X						

7. Mapping matrix of Progamme Competencies vs. Graduate Attributes

CEM Programme Attributes vs. Programme Competencies

SERIAL	CEM Programme Attributes	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – CIVIL ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2
1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;	X	X	X	X						X	X	X	X	X	X	X
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;	X	X	X	X							X	X	X	X	X	X
3	Behave professionally and adhere to engineering ethics and standards;				X						X						
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;							X									
5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;					X	X	X		X	X						
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;																
7	Use techniques, skills and modern engineering tools necessary for engineering practice;	X	X	X		X					X	X	X	X	X	X	X
8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;					X					X					X	X
9	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;								X								
10	Demonstrate leadership qualities, business administration and entrepreneurial skills.									X	X						

1a	Personal attributes such as adaptability, self-motivation, self-management, cultural awareness, honesty, and integrity.					**X**	**X**	**X**	**X**	**X**	**X**						
2a	Functional skills such as effective use of language, numbers, and IT.								**X**								
3a	Personal skills such as problem-solving, team work, understanding the organization, leadership, and innovation.	**X**						**X**	**X**	**X**	**X**	**X**	**X**			**X**	**X**

8. A- CEM Programme - Mapping matrix of Courses vs. Programme Competencies (include Prep Year)

CEM Modules vs. CEM Programme Competencies

	SERIAL	Module	Code	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – Civil ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
				A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2
Prep Semester 1	1	Mathematics for Engineers (1)	SCIB01P	x				x				x							
	2	Introductory Physics	SCIB02P		x				x		x								
	3	Engineering Mechanics *	MECH01P	x	x			x											
	4	Chemistry for Engineers *	CHME01P		x	x				x									
	5	Introduction to Computing *	COMP01P				x						x						
	6	English for Academic Purposes	ENGENGL01								x	x	x						
	7	Engineering Ethics and Human Rights *	ENGG01P				x			x	x								
Prep Semester 2	8	Mathematics for Engineers (2)	SCIB03P	x				x				x							
	9	Electricity and Magnetism	SCIB04P		x					x	x								
	10	Algebra and Geometry *	SCIB05P	x		x		x											
	11	Engineering Drawing & Descriptive Geometry*	MECH02P			x	x				x								
	12	Production Technology I *	MECH03P			x	x	x											
	13	English and Academic Writing	ENGENGL02					x		x	x	x	x						
DY1 Semester 1	14	Construction Technology and Management	CEM01C				x		x		x		x						
	15	Engineering Drawing	CEM02C							x	x								
	16	Geometrics in Surveying	CEM04C		x		x				x		x						
	17	Introduction to Construction Engineering Materials	CEM12C	x	x	x				x	x		x	x					
	18	Building Services	CEM08C				x		x		x		x			x		x	x
	19	Calculus	SCIB01C	x	x			x					x						
DY1 Semester 2	20	Research and Communication Skills	CEM11C		x			x		x	x								
	21	Differential Equations	SCIB02C	x	x			x					x						
	22	Structural Analysis and Mechanics (1)	CEM03C	x	x	x				X	x		x		x				
	23	Fluid Mechanics	CEM13C	x	x			x			x			x					
	24	Geotechnics and Engineering Geology	CEM05C	x	x	X	X			x	x		X	x	X	X			
	25	Construction Engineering Materials (1)	CEM06C	X	x					x	x			x	x				
DY2 Semester 1	26	Law in Construction	CEM16C				x				x		x				x		x
	27	Structural Analysis and Mechanics (2)	CEM07C	X	x					x	x	x	x	X	X				
	28	Computer Applications in Construction	CEM09C	x	x		x			x	x		x	X	X				
	29	Hydraulics (1)	CEM10C		x	x		x			x			X	X				

	30	Principles of Management	CEM17I				x		x								x	x	x
	31	Statistics for Engineers	SCIB03I	x	x			x		x	x		x						
DY2 Semester 2	**32**	Quantity Surveying, Estimation and Specifications	CEM10I			x	x			x		x				x	x	x	x
	33	Construction Equipment	CEM02I				x				x	x				x		x	
	34	Structural Steel Design (1)	CEM04I		x	x	x	x	x	x	x				x	x		x	
	35	Geomatics	CEM05I		x		x		x	x	x		x	X					
	36	Geotechnics	CEM06I		X	X	X	X		x	x			X				X	
	37	Reinforced Concrete Design (1)	CEM07I		x	x	X	X		x	x	x	x	X	x	x		X	
	38	Industrial Training Placement (1)	ENGG03I					x	x	x	x	x	x			x	x		
DY3 Semester 1	**39**	Water Distribution and Sewerage System	CEM09I		x	x	x		x	x	x				x	x			
	40	Reinforced Concrete Design (2)	CEM11I		x	x	x	x		x	x	x	x	X	x	x		x	
	41	Construction Planning and Scheduling	CEM20I			x			x	x	x	x	x	x		x	x	x	
	42	Management Information System	CEM19I			x			x		x					x		x	x
	43	Construction Economics and Financial Management	CEM18I	x				x			x	x	x			x		x	x
	44	Foundation Engineering	CEM05H			x	x			x	x	x	x	x	x	x		X	
DY3 Semester 2	**45**	Transport Systems	CEM12I			x	X		x	x	x				x				
	46	Irrigation Works Design (1)	CEM13I			x	x		x	x	x				x	x			
	47	Water and Wastewater Treatment	CEM14I		x	x	x		x	x	x				x	x			
	48	Project Management	CEM09H		x	x	x	x	x	x	X	x	x			x	X		
	49	Structural Steel Design (2)	CEM03H			x	x		x	x	x		x	X	x				
	50	Construction Contract Procedures	CEM23H					x		X	x	x	x			x	x	x	
	51	Industrial Training Placement (2)	ENGG07H					x	x	x	x	x	x			x	x		
DY4 S1&S2	**52**	Individual Research Project	CEM30H	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	53	Group Construction Project	CEM27H	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
DY4 Semester 1	**54**	Advanced Irrigation Works Design - Optional Module	CEM07H			x	x		x	x	x				x	x		X	
	55	Highway and Airport Engineering - Optional Module	CEM08H			x			x	x	x	x	x	x	x				
	56	Pavement Design - Optional Module	CEM15H			x			x	x	x	x	x	x	x				
	57	Earthquake Resistant Design - Optional Module	CEM21H		x	x	x	x		X	X	X	X	x	x			x	
	58	Strategic Management in Construction	CEM25H		x	x	x	x	x	x	X	x	x			x	x		
	59	Rehabilitation and Retrofitting of Structures	CEM28H	x	x		x		x	x				x	x			x	
	60	Human Resource Management in Construction	CEM29H						x	x									
DY4 Seme	**61**	Advanced Reinforced Concrete Design - Optional Module	CEM10H		x	x	x	x		x	x		x	X	x			x	

	62	Geoinformatics - Optional Module	CEM04H		x					x	X		x	X					
	63	Value and Risk Management in Construction	CEM26H		x	x	x	x	x	x	X	x	x			x	X	x	x
	64	Lean Construction	CEM31H			x	x							x		x	x	x	x
	65	Sustainability and the Built Environment	CEM32H			x	x			x	x			x		x		x	x
	66	Prestressed Concrete - Optional Module	CEM19H		x	x	x	x		x	x	x	x	X	x	x		x	
	67	Bridge Engineering - Optional Module	CEM11H		x	x	x		x	x	x	x	x	X	x	x		x	
	68	Transportation Planning - Optional Module	CEM16H		x	x			x	x	x	X	X		x				

9. Teaching and Learning methods vs. Programme Competencies

Teaching and Learning Methods vs. CEM Programme Competencies																
Teaching and Learning Methods	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – Civil ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Bcem1	Bcem2	Bcem3	Bcem4	Ccem1	Ccem2
Interactive Lectures	x			x			x				x	x		x	x	
Research	x	x	x		x		x	x	x		x	x	x	x	x	x
Collaborative Learning (Team Project)	x	x	x	x		x	x	x	x		x	x	x	x	x	
Tutorials	x	x		x			x				x	x		x	x	
Self study	x	x	x	x			x	x		x	x	x		x	x	
Labs	x	x					x	x							x	
Others	x															

10.Assessment methods vs Programme Competencies

Assessment Methods vs. CEM Programme Competencies

Teaching and Learning Methods	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – Civil ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Bcem1	Bcem2	Bcem3	Bcem4	Ccem1	Ccem2
Online Group Assignment	x		x													
Listening and Note-taking	x									x						
Speaking							x	x								
Writing Assignment				x	x			x								
Writing- academic essay								x								
Online Computer Based Project	x	x	x								x				x	
Group presentation			x	x			x	x				x			x	
Group project			x	x		x	x		x		x	x	x	x	x	
Class Test 1	x		x								x	x	x	x	x	
Individual report			x	x	x		x	x		x					x	
Individual presentation			x	x	x		x	x		x					x	
Individual project			x	x	x	x	x		x	x	x	x	x	x	x	
Individual portfolio (1)								x							x	
Practical Assessment		x														
Oral Assessment	x		x					x							x	
Design Brief (Supervisor)			x	x		x	x				x				x	
Lab Report		x														
Interim Report (Panel)			x		x		x		x	x			x	x	x	x
Student's Efforts(Supervisor)			x		x		x		x	x						x
Final Submission (Panel)			x	x	x		x		x	x			x	x		x
VIVA (Panel)			x	x	x		x			x						x
Unseen Exam	x			x							x	x	x	x	x	

Specifications of Construction Engineering and Management Programme

Program Description

Every successful project requires planning and coordination, as well as the proper utilization of the resources available. It was in the 19th century that construction management began to take shape to become the field it is now. The industrial revolution that began in the late 1700s acted as the impetus for the development of principles governing the project management process. Over time, construction project managers have taken advantage of technological tools to better manage construction sites. The field has grown to the point where apps and tools are now created specifically for these professionals.

Construction Engineering and Management concerns the planning and management of the construction process for different construction projects such as buildings, highways, bridges, airports, railroads, dams, and reservoirs. Construction of such projects requires knowledge of management principles, business procedures and human behaviour. Construction Engineers equipped with state-of-the-art smart tools and applications engage in the design of structures, advanced construction methods, feasibility studies, procurement and contract management, cost estimation, planning and scheduling, project controls, quality assurance and quality control, building and site layout surveys, on site material testing, concrete mix design, safety engineering, and equipment selection.

The main objective of the CEM programme at the BUE is to provide the latest-state-of-the art of basic undergraduate education required for industrial and public practices in applying the design processes in the civil engineering area to the construction engineering field and industry. Also, it helps students to grasp the idea of construction and project management or for continued education in the field of construction project and engineering management for those who want to pursue further postgraduate studies.

Career Prospects

There are many career paths and interrelated areas in the field of construction, which can progress from construction methods to construction management, with numerous other areas of interest in between. Construction management involves the overseeing, planning, designing, and budgeting of small and large-scale construction projects, and there are different paths that a career in this type of management can take.

Careers directly related to management in construction are diversified and multi-faceted, yet they include several interrelated aspects that are consistent with construction standards and principles across the board. With what is available in the field, there are numerous choices for those who love building, creating, managing, and maintaining structures. Different yet related positions that are centred on construction and management include feasibility studies, building surveying, planning and scheduling, contract management, arbitration, risk analysis, project controls, facility management, sustainability, safety management, and quality management.

1. Basic Information

1	**Programme title**	**Construction Engineering and Management**
2	**Name of the final award**	**BSc with honours [validated by UK partner]**
3	**Awarding body/institution**	**The British University in Egypt**
4	**Faculty**	**Engineering**
5	**Department**	**Civil Engineering**
6	**Dean (HoD)**	**Prof. Maguid Hassan**
7	**Head of Department**	**Prof. Ghada El-Mahdy**
8	**Programme Director (PD)**	**Dr. Ahmed Alhady**
9	**Professional, Statutory and Regulatory Body Accreditation**	**Egyptian Engineering Syndicate**
10	**Date of initial internal review**	**March 2017**
11	**Date of internal review and updates**	**November 2019- Appendix 11 shows summary of updates**
12	**Approval Date to adopt NARS 2018 by:** **Departmental Council** **Faculty Council**	**- 4 October 2020** **- 18 January 2021**

2. Programme Mission

The mission of the Construction Engineering and Management Programme in the Civil Engineering Department is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry, and to achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards, who are independent learners.

3. Programme Aims

The programme aims:

- To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyse complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development.
- To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Construction Engineering and Management.
- To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.

- To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.

4. Distinctive Features of the Programme

The BUE delivers programmes based on a British philosophy of education. This results in programmes that are very much focused on the students rather than those who deliver the material. Graduates from UK programmes typically exhibit:

- the ability to think creatively and with strong problem-solving skills.
- high level key and transferable skill sets.
- independently maintained high level of professional and subject specific as well as general technical competence.
- the ability to consider problems at a high level (i.e., to see the big picture);
- diligence and ethical working practices.
- flexibility and the ability to apply their subject-specific knowledge to fields outside of their own.

The BUE Mission is to be the leading provider of high-quality UK style education in the MENA region. The University is committed to ensuring UK validation of its programmes and to ensure a student experience that is in line with UK standards. Built on top of institutional quality assurance is subject level validation and the Faculty is committed to ensuring that its UK validating partners confirm that its degree programme is in line with UK standards. An indicator of this will be the dual award of both an Egyptian BSc and a BEng from a UK university in Civil Engineering.

The Civil Engineering Department at BUE strives to provide an up-to-date technical programme, to its students, in order to provide a self-reliant construction engineer who is capable of keeping up and coping with today's and tomorrow's fast changing high tech structures and systems. The programme offers a unique set of modules and specialty areas that allow the student to develop the necessary skills and/or background for purpose.

Furthermore, we will be seeking accreditation of this degree programme with the Chartered Institute of Building (CIOB) the UK's leading professional body for this programme discipline. Accredited degree programmes are the preferred and fast track routes for those who aim to obtain the professional qualification of Chartered Engineer (CEng). For a brief overview on the requirements of the Chartered Institute of Building (CIOB) and why it is important to gain membership refer to: https://www.ciob.org.

At the time of writing, and to the best of our knowledge, this combination of academic and professional accreditation makes our programme in Construction Engineering and Management quite unique in both Egypt and the surrounding region.

5. Relevant Subject Benchmark Statements and other External and Internal Reference Points Used to achieve Programme Outcomes

To ensure that the programme complies with the requirements of relevant national and international professional institutions/bodies, and to qualify graduates to apply for memberships in respective institutions and/or gain Chartered Engineer status, the following are used as reference points to inform the programme outcomes:

- The revised UK Quality Code for Higher Education, UKSCQA/02, March 2018 - https://www.qaa.ac.uk/quality-code.
- Descriptor for a higher education qualification at level 6 on the FHEQ; bachelor's degree with honours. UK Quality Code for Higher Education Part A: Setting and Maintaining Academic Standards Part A, The Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies, QAA, October 2014 - https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf
- Annex D: Outcome classification descriptions for FHEQ Level 6 and FQHEIS Level 10 degrees, QAA, 2019 - https://www.qaa.ac.uk/docs/qaa/quality-code/annex-d-outcome-classification-descriptions-for-fheq-level-6-and-fqheis-level-10-degrees.pdf?sfvrsn=824c981_10
- SEEC Credit Level Descriptors for Higher Education, SEEC, 2016 - http://www.seec.org.uk/wp-content/uploads/2016/07/SEEC-descriptors-2016.pdf
- QAA Subject benchmark statements: Subject Land, Construction, Real Estate and Surveying October 2019 - https://www.qaa.ac.uk/quality-code/subject-benchmark-statements
- QAA guidelines for preparing programme specifications *http://www.qaa.ac.uk/academicinfrastructure/programmeSpec/default.asp*.CIOB (Chartered Institute of Building) *http://www.ciob.org.uk/*
- *QAA Subject Benchmark Statements: Engineering, March 2023* Subject Benchmark Statement: Engineering (qaa.ac.uk)
- *Engineering Council Accreditation of Higher Education Programmes: UK Standard for Professional Engineering Competence - UK SPEC 3rd Edition - http://www.engc.org.uk/UKSPEC*
- The Construction Engineering and Management programme originally adopted NARS 2009 and upon the issuing of national Academic Reference Standards (NARS 2018 for Engineering 2nd edition), the programme performed a gap analysis with additional action plan to bridge all gaps if any. Hence, the programme specification is updated to comply with National Academic Reference Standards (NARS 2018) developed by The National Authority of Quality Assurance and Accreditation of Education (NAQAAE), https://admin.naqaae.eg/api/v1/archive/download/34733).

6. Graduate Attributes

The creative way of approaching all engineering challenges is being seen increasingly as a 'way of thinking' which is generic across all disciplines. The Construction Engineering and Management Programme adopted the NARS 2018 attributes for Engineering and Civil Engineering. The graduates of Civil Engineering should have the ability to:

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.
2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.
3. Behave professionally and adhere to engineering ethics and standards.
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.
7. Use techniques, skills, and modern engineering tools necessary for engineering practice.
8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.
9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.

In addition to the general attributes of engineer, the construction engineer must be able to:

- Personal attributes such as adaptability, self-motivation, self-management, cultural awareness, honesty, and integrity.
- Functional skills such as effective use of language, numbers, and IT.
- Personal skills such as problem-solving, team work, understanding the organization, leadership, and innovation.

University Requirements

The university is considered a core of Human Thinking at its highest level, and the source of investment and development of human resources. It is concerned with the rise of the Arabian Civilization and the Historical Heritage of the Egyptian Society, and its traditions. It is also concerned with the education of Religion, Morals and Nationalism (Egyptian National Law for Universities, Law 49 for Year 1972). Therefore, BUE graduates should be able to or aware of:

- National, regional, and international contemporary issues, to have an intellectual and enlightened personality and to interact effectively in the community through different communication skills.
- To achieve this goal, BUE has designed several courses planned to build the student personality, develop his/her skills, and increase his/her awareness of different topics. These courses are listed in Table 6 for the CEM Programme.

Faculty Requirements

The Construction Engineering and Management programme offered at the Faculty of Engineering, the British University in Egypt, is an Engineering Programme. The graduates have the privilege of being Engineers and are automatically enrolled in the Egyptian Engineering Syndicate (EES). The graduates are also entitled to take the Fundamentals of Engineering Exam offered by the National Council of Examiners for Engineering and Surveying (NCEES), based on the agreement between EES and NCEES.

Competencies for Engineering Graduates

According to the **National Academic Reference Standards (NARS-2018),** the **Engineering Graduate must be able to (A-Level):**

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.

A2. Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.

A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.

A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.

A5. Practice research techniques and methods of investigation as an inherent part of learning.

A6. Plan, supervise and monitor implementation of engineering projects.

A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.

A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

A9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.

A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

- Courses required to achieve these competencies (A-level) are listed in Table 7 for the CEM Programme.

Discipline Requirements (Construction Engineering and Management Requirements)

According to the National Academic Reference Standards (NARS-2018), each Construction Engineering and Management graduate must meet specific competencies. Thus, in addition to the Competencies of all Engineering Programmes (A-Level), the Civil Engineering graduate must be able to (B-Level):

B.1. Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics;

B.2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbours; or any other emerging field relevant to the discipline;

B.3. Plan and manage construction processes, address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects;

B.4. Deal with biddings, contracts and financial issues including project insurance and guarantees.

- Courses required to achieve these competencies (B-level) are listed in Table 8 for the CEM Programme.

Programme Competencies for UK Requirements:

The Construction Engineering and Management Programme adopted the National Reference Standards (NARS) issued in 2018 at the level of competencies (A & B) considering A as general competencies for all engineers and B as specialized competencies for civil engineering as the closest discipline to construction engineering and management.

In order to meet the advanced programme which is considered as an essential requirement for the British Partner and QAA, the Programme also adopted (ARS) at the level of (C) for professional engineering competencies.

C1 specifies an advanced modern knowledge of software packages and smart systems. which is a higher level of practice than basic knowledge and skills given in B Competencies. C2 covers writing a dissertation and possibly publishing research work that is a higher level of research than "Practice research techniques and methods of investigation as an inherent part of learning" as given in A5 competency. Also, the program requires the writing of a dissertation as part of the research graduation project.

Accordingly, the Construction Engineering and Management Programme graduate must be able to:

C.1. Acquire modern knowledge, model, and apply advanced software packages and smart systems to solve complex construction problems utilizing optimization, simulation, and heuristic modelling techniques.

C.2. Conduct research and write a dissertation on any topic related to construction management, smart systems and cities, building information modelling, and UN sustainable development goals.

- Courses required to achieve these competencies (C-level) are listed Table 9 for the CEM Programme.

7. Programme Structure, Levels, Modules, Credits and Awards.

Credit Point System

- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) to be awarded a UK validated degree. This is in addition to the specialist courses (modules) and other requirements of the Egyptian Supreme Council of Universities required for the Egyptian degree.
- The programme is divided into teaching units called modules (courses), which are each assigned a credit weighting.
- Each module (course) is assigned a Level, number of credits and weighting, this reflects the depth of learning required in the relevant programme year.
- A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 36 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study and assessment.
- Students study modules (courses) with a combined weight of 120 credit points in each year (60 credit points per semester)

- Modules (courses) that are delivered in one semester have their assessment completed within the semester in which they are taught. The programme is structured such that formal examinations can take place at the end of each semester.

Academic Semesters

- The academic year is divided into two semesters: Semester 1 and Semester 2.
- Each semester is 15-weeks in length.
- Week 13 being a revision week, and weeks 14- 15 being assessment weeks at the end of each semester.
- The Academic year includes a summer assessment period where students can resit-failed modules (courses).

Programme Levels

- The whole programme, of total 600 credit points, is divided into four levels P, C, I and H (120 for P and 160 for each of C, I and H), according to the Framework for Higher Education Qualifications of UK Degree-Awarding Bodies.
- These levels reflect the depth of learning required in the relevant programme year.
- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) of the UK Degree-Awarding Bodies to be awarded a UK validated degree, in addition to the Egyptian degree.
- Each programme is also divided into **four levels of competencies, as per the NARS 2018**, as follows:
  - Level (0) university requirements
  - Level (A) Faculty requirements
  - Level (B) Discipline requirements
  - Level (C) Programme requirements

Duration of Study

- The duration of Study is five years (10 semesters) including a Preparatory Year.

Programme Structure

- All taught undergraduate programmes at BUE are modular in structure.
- The Construction Engineering and Management Programme is assigned as a credit weighting. A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 35 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study, and assessment. The maximum credit weighting for any one module is normally 20 credits.
- Modules that are delivered over two semesters have 20-50% of their assessment completed in semester one and the remainder in semester two, with formal examinations (where applicable) taking place in weeks 14 to 15 of semester two.

8. Conformity of the Construction Engineering and Management Programme to Supreme Council of Universities (SCU) Guidelines

The SCU guidelines consists of seven major categories that run throughout the whole programme; namely: Human and Social Sciences; Mathematics and Basic Science, Basic Engineering Science, Applied Engineering Sciences, Computer Applications and ICT, Projects and Practice and Discretionary (Institution character- identifying) Subject with range of weights of [9-12%], [20-26%], [20-23%], [20-22%], [9-11%], [8-11%], and [6-8%] respectively. The credits contribution, of the major categories in the Construction Engineering and Management programme is presented as follows:

Table 4 Indicative Curricula Content by Subject Area

Total no. of hrs / programme = 600											
Curricula Content by Subject Area		Number of Courses	No of Course / levels					Total no. of hrs / subject area	% of subject area	Total % of NARS
			Prep year	DY1 (hrs)	DY2 (hrs)	DY3 (hrs)	DY4 (hrs)			
A	Humanities and social Science	7	3	1	1	2	-	65	11%	9-12
B	Mathematics and Basic Science	12	7	3	2	0	-	120	20%	20-26
C	Basic Engineering Science	12	2	4	4	2	-	120	20%	20-23
D	Applied Engineering and Design	12	-	-	3	6	3	120	20%	20-22
E	Computer Applications and ICT	7	1	1	2	-	3	65	11%	9-11
F	Projects and Practice	6	-	1	-	2	3	60	10%	8-11
G	Discretionary (Institution character-identifying) Subject	5	-	2	-	-	3	50	8%	6-8

Total no. of hrs / programme = 600										
Curricula Content by Subject Area		Number of Courses	No of Course / levels					Total no. of hrs / subject area	% of subject area	Total % of NARS
			Prep year	DY1 (hrs)	DY2 (hrs)	DY3 (hrs)	DY4 (hrs)			
	Total No. of hrs /DY		120	120	120	120	120	600		

Table 5 Major Categories of CEM Programme

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
	University Requirements									
Prep	ENGENG L01	English for Academic Purposes	10	X						
Prep	ENGG01P	Engineering Ethics and Human Rights	5	X						
Prep	ENGENG L02	English and Academic Writing	10	X						
1	CEM11C	Technical Writing	10	X						
2	CEM03I	Construction Contracts	10			X				
	Level A	**Faculty Requirements**								
Prep	MECH01P	Engineering Mechanics	10		X					
Prep	MECH02P	Engineering Drawing & Descriptive Geometry	10			X				
Prep	SCIB01P	Mathematics for Engineers (1)	10		X					
Prep	COMP01P	Introduction to Computing	5					X		
Prep	SCIB02P	Introductory Physics	10		X					
Prep	CHME01P	Chemistry for Engineers	10		X					
Prep	SCIB03P	Mathematics for Engineers (2)	10		X					
Prep	SCIB04P	Electricity and Magnetism	10		X					

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
Prep	SCIB05P	Algebra and Geometry	10		X					
Prep	MECH03P	Production Technology I	10			X				
1	CEM02C	Engineering Drawing	10							X
1	CEM15C	Engineering Mechanics	10		X					
1	SCIB01C	Calculus	10		X					
1	SCIB02C	Differential Equations	10		X					
2	SCIB03I	Statistics for Engineers	10		X					
	Level B	**Discipline Requirements**								
1	CEM01C	Construction Technology and Building Services	10							X
1	CEM03C	Theory of Structures for Construction Engineers (1)	10			X				
1	CEM04C	Surveying for Construction Engineers	10						X	
1	CEM06C	Properties & Testing of Construction Materials	10			X				
1	CEM12C	Strength of Materials	10			X				
1	CEM13C	Hydraulics for Construction Engineers	10			X				
1	CEM14C	Computer Aided Drafting (CAD)	10					X		
2	CEM05C	Soil Mechanics for Construction Engineers	10			X				
2	CEM07C	Theory of Structures for Construction Engineers (2)	10			X				
2	CEM09C	Computer Applications in Construction	10					X		
2	CEM17C	Principles of Management	10	X						
2	CEM04I	Structural Steel Design for Construction Engineers	10				X			

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
2	CEM07I	Fundamentals of Reinforced Concrete	10				X			
2	CEM09I	Water Distribution & Sewerage Systems	10				X			
2	CEM10I	Quantity Surveying, Estimation, and Specifications	10			X				
3	CEM06I	Foundation Engineering for Construction Engineers	10				X			
3	CEM08I	Construction Methods (1)	10						X	
3	CEM11I	Reinforced Concrete Design for Construction Engineers	10				X			
3	CEM12I	Transport Systems	10			X				
3	CEM13I	Water Resources Engineering and Management	10				X			
3	CEM14I	Water & Wastewater Treatment	10				X			
3	CEM020I	Construction Management (1)	10			X				
3	CEM01H	Construction Equipment	10				X			
	Level C	**Programme Requirements**								
2	CEM01I	Building Information Modelling (BIM)	10					X		
2	CEM18I	Engineering Economy	10		X					
3	CEM15I	Financial Management in Construction	10	X						
3	CEM02H	Claims and Disputes in Construction	10	X				X		
3	CEM09H	Construction Management (2)	10						X	
3	CEM25H	Strategic Management in Construction	10				X			
4	CEM13H	Introduction to Simulation & AI Applications in Construction	10					X		

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
4	CEM14H	Construction Methods (2)	10						X	
4	CEM20H	Optimization Techniques for Construction Applications	10					X		
4	CEM26H	Value and Risk Management in Construction	10					X		
4	CEM28H	Rehabilitation and Retrofitting of Structures	10				X			
4	CEM32H	Sustainability & the Built Environment	10							X
4	CEM27H	Group Construction Project	20						X	
4	CEM30H	Individual Research Project	20							X
4		Elective Course 1	10				X			
4		Elective Course 2	10				X			
		Elective Courses								
4	CEM06H	Environmental Management	10				X			
4	CEM12H	Infrastructure Asset Management	10				X			
4	CEM16H	Transportation Planning	10				X			
4	CEM17H	Management of Multiple Construction Projects	10				X			
4	CEM29H	Human Resource Management in Constrcution	10				X			
4	CEM31H	Lean Construction	10				X			
4	CEM33H	Quality and Safety Management in Construction	10				X			
4	CEM34H	Information Technology Applications in Construction	10				X			
		Total	600	65	120	120	120	65	60	50
		%	100	11	20	20	20	11	10	8

CEM Programme Courses

Courses required to achieve University Requirements

Table 6 List of University requirements courses.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
ENGENGL01	English for Academic Purposes	10	0	4	0	4
ENGENGL02	English and Academic Writing	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights	5	2	0	0	2
CEM11C	Technical Writing	10	2	1	0	3
CEM03I	Construction Contracts	10	2	1	0	3
Total University requirements		**45**	**6**	**10**	**0**	**16**

Courses Required to achieve the General Competencies of A-level (Faculty Requirements)

A set of courses must be completed as a Faculty Requirement. These courses are divided into Basic Science Courses and Basic Engineering Courses.

Table 7 List of Faculty requirements courses.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry	10	2	2	0	4
MECH01P	Engineering Mechanics	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry	10	2	3	0	5
MECH03P	Production Technology I	10	2	2	0	4
CHME01P	Chemistry for Engineers	10	2	1	2	5
COMP01P	Introduction to Computing	5	2	0	2	4
CEM02C	Engineering Drawing	10	1	2	0	3
CEM12C	Engineering Mechanics	10	2	2	0	4
SCIB01C	Calculus	10	2	2	0	4
SCIB02C	Differential Equations	10	2	2	0	4
SCIB03I	Statistics for Engineers	10	2	2	0	4
ENGG03I	Industrial Training Placement (1)	0	0	0	0	0
ENGG07H	Industrial Training Placement (2)	0	0	0	0	0
Total Faculty Requirements		**145**	**29**	**26**	**8**	**63**

Courses Required to achieve Construction Engineering and Management Requirements of B-level (Discipline Requirements):

A set of courses must be completed as a Basic Civil Engineering Requirements, in the Construction Engineering and Management Programme.

Table 8 List of Discipline requirements courses (Construction Engineering and Management)

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
CEM01C	Construction Technology and Building Services	10	2	1	1.3	4.3
CEM03C	Theory of Structures for Construction Engineers (1)	10	2	2	0	4
CEM04C	Surveying for Construction Engineers	10	2	1	0	3
CEM12C	Strength of Materials	10	2	1.3	0.7	4
CEM05C	Soil Mechanics for Construction Engineers	10	2	0.7	0.3	3
CEM06C	Properties and Testing of Construction Materials	10	2	1.3	0.7	4
CEM07C	Theory of Structures for Construction Engineers (2)	10	2	2	0	4
CEM09C	Computer Applications in Construction	10	1	0	2	3
CEM13C	Hydraulics for Construction Engineers	10	2	0.7	0.3	3
CEM14C	Computer Aided Drafting (CAD)	10	1	0	2	3
CEM17C	Principles of Management	10	2	1	0	3
CEM04I	Structural Steel Design for Construction Engineers	10	2	2	0	4
CEM06I	Foundation Engineering for Construction Engineers	10	2	2	0	4
CEM07I	Fundamentals of Reinforced Concrete	10	2	2	0	4
CEM08I	Construction Methods (1)	10	2	1	0	3
CEM09I	Water Distribution & Sewerage Systems	10	2	1	0	3
CEM10I	Quantity Surveying, Estimation and Specifications	10	2	1	0	3
CEM11I	Reinforced Concrete Design for Construction Engineers	10	2	2	0	4
CEM12I	Transport Systems	10	2	1	0	3
CEM13I	Water Resources Engineering and Management	10	2	1	0	3
CEM14I	Water & Wastewater Treatment	10	2	0.75	0.25	3
CEM20I	Construction Management (1)	10	2	1	0	3
CEM01H	Construction Equipment	10	2	1	0	3
Total		230	44	26.8	7.5	78.3

Courses Required to achieve the Competencies of C-level (Programme Competencies for Major Requirements):

Courses Required to get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed:

Table 9 List of Discipline requirements courses (Construction Engineering and Management)

Code	**Course Title**	**Credits**	**Contact Hours**			
		BUE	Lec	Tut	Lab	TT
	University Requirements	**45**	**6**	**10**	**0**	**16**
	Faculty of Engineering Requirements	**145**	**29**	**26**	**8**	**63**
	Discipline Civil Engineering Requirement	230	44	26.8	7.5	78.3
University + Faculty + Discipline Requirements Total		420	79	62.8	15.5	157.3
	Programme Requirements					
CEM01I	Building Information Modelling (BIM)	10	2	1	0	3
CEM15I	Financial Management in Construction	10	2	1	0	3
CEM18I	Engineering Economy	10	2	1	0	3
CEM02H	Claims and Disputes in Construction	10	2	1	0	3
CEM09H	Construction Management (2)	10	2	1	0	3
CEM13H	Introduction to Simulation and AI Applications in Construction	10	2	1	0	3
CEM14H	Construction Methods (2)	10	2	1	0	3
CEM20H	Optimization Techniques for Construction Applications	10	2	1	0	3
CEM25H	Strategic Management in Construction	10	2	1	0	3
CEM26H	Value & Risk Management in Construction	10	2	1	0	3
CEM28H	Rehabilitation and Retrofitting of Structures	10	2	1	0	3
CEM32H	Sustainability and the Built Environment	10	2	1	0	3
CEM27H	Group Construction Project	20	0	1	0	1
CEM30H	Individual Research Project	20	0	1	0	1
CIVLXXH	Elective Course 1	10	2	1	0	3
CIVLXXH	Elective Course 2	10	2	1	0	3
Programme Requirements Total		180	28	16	0	44
Construction Engineering Programme Requirements Total		600	107	78.8	15.5	201.3

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 1 of Elective Courses						
DY4 - Semester (1)						
CEM06H	Environmental Engineering Management	10	2	1	0	3
CEM12H	Infrastructure Asset Management	10	2	1	0	3
CEM29H	Human Resource Management in Construction	10	2	1	0	3
CEM33H	Quality and Safety Management in Construction	10	2	1	0	3

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 2 of Elective Courses						
DY4 - Semester (2)						
CEM16H	Transportation Planning	10	2	1	0	3
CEM17H	Management of Multiple Construction Projects	10	2	1	0	3
CEM31H	Lean Construction	10	2	1	0	3
CEM34H	Information Technology Applications in Construction	10	2	1	0	3

Proposed Study Plan –CEM Programme

To get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Preparatory Year - Semester (1)						
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
MECH01P	Engineering Mechanics *	10	2	2	0	4
CHME01P	Chemistry for Engineers *	10	2	1	2	5
COMP01P	Introduction to Computing *	5	2	0	2	4
ENGENGL01	English for Academic Purposes	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights *	5	2	0	0	2
Total		60	12	10	6	28

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Preparatory Year - Semester (2)						
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry *	10	2	2	0	4
MECH02P	Engineering Drawing & Descriptive Geometry*	10	2	3	0	5
MECH03P	Production Technology I *	10	2	2	0	4
ENGENGL02	English and Academic Writing	10	0	4	0	4
Total		60	10	14	2	26

*** Modules that are taught to half the cohort in semester one and the other half in semester two.**

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY1 - Semester (1)					
CEM01C	Construction Technology and Building Services	10	2	1	1.3	4.3
CEM02C	Engineering Drawing	10	1	2	0	3
CEM04C	Surveying for Construction Engineers	10	2	1	0	3
CEM15C	Engineering Mechanics	10	2	2	0	4
CEM12C	Strength of Materials	10	2	1.3	0.7	4
SCIB01C	Calculus	10	2	2	0	4
Total		60	11	9.3	2	22.3

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY1 - Semester (2)					
CEM03C	Theory of Structures for Construction Engineers (1)	10	2	2	0	4
CEM14C	Computer Aided Drafting (CAD)	10	1	0	2	3
CEM06C	Properties and Testing of Construction Materials	10	2	1.3	0.7	4
CEM11C	Technical Writing	10	2	1	0	3
CEM13C	Hydraulics for Construction Engineers	10	2	0.7	0.3	3
SCIB02C	Differential Equations	10	2	2	0	4
Total		60	11	7	3	21

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 - Semester (1)					
CEM07C	Theory of Structures for Construction Engineers (2)	10	2	2	0	4
CEM10I	Quantity Surveying, Estimation and Specifications	10	2	1	0	3
CEM05C	Soil Mechanics for Construction Engineers	10	2	0.7	0.3	3
CEM09C	Computer Applications in Construction	10	1	0	2	3
CEM17C	Principles of Management	10	2	1	0	3
CEM18I	Engineering Economy	10	2	1	0	3
Total		60	11	5.7	2.3	19

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 - Semester (2)					
CEM09I	Water Distribution & Sewerage Systems	10	2	1	0	3
CEM01I	Building Information Modelling (BIM)	10	2	1	0	3
CEM03I	Construction Contracts	10	2	1	0	3
SCIB03I	Statistics for Engineers	10	2	2	0	4
CEM07I	Fundamentals of Reinforced Concrete	10	2	2	0	4
CEML04I	Structural Steel Design for Construction Engineers	10	2	2	0	4
Total		60	11	5.7	2.3	19

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
		DY2 – Summer Semester				
ENGG03I	Industrial Training Placement (1)	0	0	0	0	200

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
		DY3 - Semester (1)				
CEM06I	Foundation Engineering for Construction Engineers	10	2	2	0	4
CEM20I	Construction Management (1)	10	2	1	0	3
CEM11I	Reinforced Concrete Design for Construction Engineers	10	2	2	0	4
CEM13I	Water Resources Engineering and Management	10	2	1	0	3
CEM08I	Construction Methods (1)	10	2	1	0	3
CEM15I	Financial Management in Construction	10	2	1	0	3
Total		60	12	8	0	20

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
		DY3 - Semester (2)				
CEM01H	Construction Equipment	10	2	1	0	3
CEM12I	Transport Systems	10	2	1	0	3
CEM25H	Strategic Management in Construction	10	2	1	0	3
CEM14I	Water & Wastewater Treatment	10	2	0.75	0.25	3
CEM09H	Construction Management (2)	10	2	1	0	3
CEM02H	Claims and Disputes in Construction	10	2	1	0	3
Total		60	12	5.75	0.25	18

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
		DY3 – Summer Semester				
ENGG07H	Industrial Training Placement (2)	0	0	0	0	200

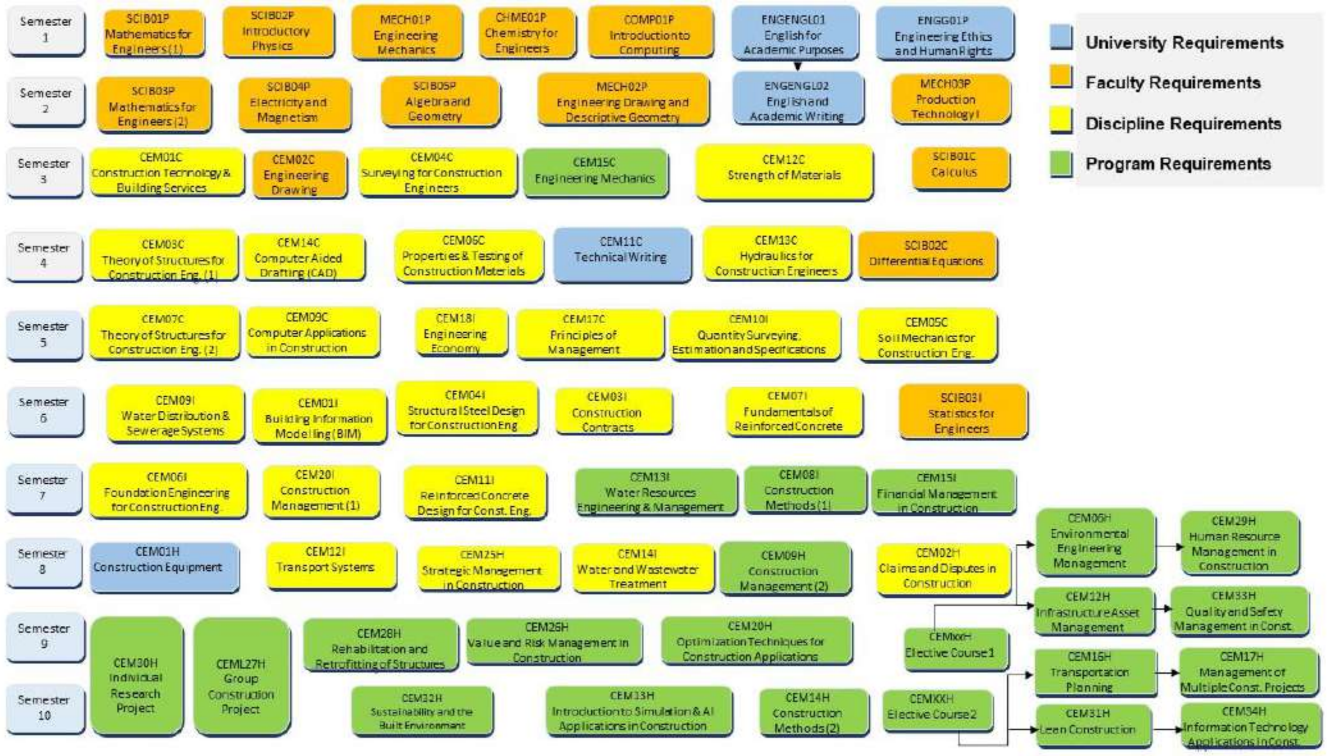
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
		DY4 - Semester (1)				
CEM30H	Individual Research Project	10	0	0.5	0	0.5
CEM27H	Group Construction Project	10	0	0.5	0	0.5
CEM28H	Rehabilitation and Retrofitting of Structures	10	2	1	0	3
CEM26H	Value & Risk Management in Construction	10	2	1	0	3
CEM20H	Optimization Techniques for Construction Applications	10	2	1	0	3
CIVLXXH	Elective Course 1	10	2	1	0	3
Total		60	8	5	0	13

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY4 - Semester (2)					
CEM30H	Individual Research Project	10	0	0.5	0	0.5
CEM27H	Group Construction Project	10	0	0.5	0	0.5
CEM32H	Sustainability and the Built Environment	10	2	1	0	3
CEM14H	Construction Methods (2)	10	2	1	0	3
CEM13H	Introduction to Simulation and AI Applications in Construction	10	2	1	0	3
CIVLXXH	Elective Course 2	10	2	1	0	3
Total		60	8	5	0	13

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 1 of Elective Courses						
	DY4 - Semester (1)					
CEM06H	Environmental Engineering Management	10	2	1	0	3
CEM12H	Infrastructure Asset Management	10	2	1	0	3
CEM29H	Human Resource Management in Construction	10	2	1	0	3
CEM33H	Quality and Safety Management in Construction	10	2	1	0	3

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 2 of Elective Courses						
	DY4 - Semester (2)					
CEM16H	Transportation Planning	10	2	1	0	3
CEM17H	Management of Multiple Construction Projects	10	2	1	0	3
CEM31H	Lean Construction	10	2	1	0	3
CEM34H	Information Technology Applications in Construction	10	2	1	0	3

Programme Courses Tree –CEM Programme



9. An Overview of Teaching, Learning and Assessment Strategies to Enable Competencies to be Achieved and Demonstrated

A. Learning and Teaching Methods

Throughout the programme students are encouraged to undertake independent reading both to supplement and consolidate what is being taught and to broaden, develop and reinforce their competencies throughout the programme. Targeted delivery may come from a variety of sources such as

1. Lectures.
2. Tutorials.
3. problem solving classes.
4. laboratory exercises.
5. coursework exercises and self-study and particularly through project work undertaken both in groups and individually.

Further support is gained through study skills delivered as a matter of policy within both the English language programme and individual modules.

10. Support for Learning

- All resources needed for the modules (Courses) are updated and uploaded on the E-Learning https://learn1.bue.edu.eg/ .
- The tutorials are designed by the module leaders (course leader) to ensure a strong link with module contents to provide students with useful, challenging, good support & practice for the material discussed in lectures.
- Students are provided with feedback related to their submissions within two weeks of submissions.
- For assessed work, feedback is provided in the form of individual written feedback on coursework and as a discussion during tutorials.
- For developmental work, feedback is delivered in the form of dialogue between students and staff in tutorials as well as individual feedback provided in tutorials.
- Weaker students are supported with additional remedial classes and clinics during office hours to uplift their performance.
- A generic exam feedback is developed and posted on E-learning after releasing scripts to students each semester. Students will be notified via e-mail once generic feedback is uploaded.
- Institutional services including the Library, Welfare Counsellor, Faculty services including a Student Support Officer and Programme Handbook.

B. Assessment

Competencies are tested and assessed throughout the programme using a variety of forms that typically include a combination of

1. Unseen written examinations.
2. Computer aided assessments.
3. Coursework assignments.
4. Project reports and/or papers.
5. Oral presentations.
6. Visual presentations.

Coursework forms a particularly important part of the assessment. This method of assessment can

(i) be used to strongly motivate independent learning
(ii) improve student planning and time management skills and
(iii) to develop the comprehension and usage of technical English (particularly important for students at the BUE).

Examinations show how well the student can demonstrate their mastery of an area of scholarly knowledge by selecting appropriate material from memory and applying it to an unseen question in a limited time period. Coursework allows the student to demonstrate wider academic skill of focused scholarly research, drafting, editing and polished writing.

Applied skills are tested and assessed throughout the programme using a combination of coursework assignments, design studies, laboratory logbooks, project reports and/or papers, project logbooks and work placement reports.

11. Crisis and Disaster Management

The faculty of Engineering manages crisis and disaster through the following:

1. Crisis and Disaster Committee
2. Contingency Plan
3. Health and Safety
4. Contact Trees

12. Entry Requirements

In addition to the requirements listed in Part-B, students are required to successfully complete of the Engineering Preparatory Year and passing the entry exam which evaluates student's abilities and architectural skills.

Other admission routes may be considered in accordance with the University's regulations as defined in the Undergraduate Academic Regulations.

13. Quality Assurance and Programme Enhancement

- In accordance with the University's Quality Assurance procedures, as defined in the Annual Quality Assurance and Enhancement Cycle.
- Feedback on all aspects of this programme will be obtained via standard procedures from the University's framework for quality assurance, as defined in the Annual Quality and Enhancement Cycle.

14. Programme Management

- Head of Department
- Programme Director

The programme management is mainly carried out by the HoD. However, the main task of the PD is to monitor the sound delivery of the programme, and the maintenance of academic standards and quality, in line with the University's Strategic Plan for Teaching and Learning.

In addition to the previous, monthly Departmental meetings are carried out with all department's staff members. Related issues are raised for in-depth analysis and discussion to the FTLC that in turn raises with the UTLC and Senate for final decision.

15. Appendices

1. Mapping Matrix of Programme Mission vs. Faculty Mission

CEM Programme Mission vs. Faculty Mission
رسالة البرنامج مع الرسالة الكلية

SERIAL	CEM Programme Mission	Faculty of Engineering Mission		
		The mission of the Faculty of Engineering is to provide a broad spectrum of education and research with a British ethos,	working with UK and global partners to offer internationally recognized quality degrees that enable graduates to develop their knowledge and entrepreneurship skills	to contribute to the community development.
1	The mission of the Construction Engineering and Management Programme is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry.	x	x	
2	To achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards.		x	x
3	To produce graduates who are independent learners.		x	x

2. Mapping Matrix of Programme Mission vs. Graduates Attributes.

Attributes of Engineering Graduate vs. Programme Mission توافق سمات / مواصفات خريجي البرنامج مع رسالة البرنامج				
Attributes of Engineering Graduate (CEM Prog.)		CEM Programme Mission		
		1. The mission of the Construction Engineering and Management Programme is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry.	2. To achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards.	3. To produce graduates who are independent learners.
1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;	x	x	x
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;	x	x	x
3	Behave professionally and adhere to engineering ethics and standards;		x	
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;		x	
5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	x	x	
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;		x	
7	Use techniques, skills and modern engineering tools necessary for engineering practice;	x		
8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post-graduate and research studies;			x
9	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;	x	x	
10	Demonstrate leadership qualities, business administration and entrepreneurial skills.	x	x	

1a	Personal attributes such as adaptability, self-motivation, self-management, cultural awareness, honesty, and integrity.	**x**	**x**	**x**
2a	Functional skills such as effective use of language, numbers, and IT.	**x**	**x**	**x**
3a	Personal skills such as problem-solving, team work, understanding the organization, leadership, and innovation.	**x**	**x**	**x**

3. Mapping matrix of Programme Mission to Programme Competencies

CEM Programme Mission vs. NARS Competencies 2018 رسالة البرنامج مع المعايير الأكاديمية																	
SERIAL	CEM Programme Mission	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – CIVIL ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2
1	The mission of the Construction Engineering and Management Programme is to provide a state-of-the-art programme that reflects a flexibility in changing to match the fast pace of emerging technologies employed in the civil engineering industry.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2	To achieve the BUE and Faculty key objectives to promote cultural, economic, social and technological development via capable civil engineering graduates, educated to the best UK academic standards.			x			x	x	x	x						x	x
3	To produce graduates who are independent learners.										x						

4. Mapping Matrix of Programme Aims (Objectives) vs. Faculty Aims (Objectives)

CEM Programme Objectives vs. Faculty Strategic Objectives					
SERIAL	Faculty Strategic Objectives	CEM Programme Objectives			
		1. To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyze complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development	2. To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Construction Engineering and Management.	3. To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.	To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.
1. Teaching and Learning Objectives					
1	Develop new undergraduate programmes to support Egypt's development	X	X	X	X
2	Embed entrepreneurial skills as an integral element within all programmes	X	X	X	
3	Introduce the concept of sustainable design in all programmes		X	X	
4	Raise student intake standard			X	
5	Reward innovative and creative teaching activities	X			
6	Introduce online learner support resources relevant to programmes of study	X	X	X	
7	Convert all frequent student services to online media	X			
8	Propose alternative furniture options to allow for flexible classroom settings			X	
9	Enhance Student Support Officer role	X			
10	Develop staff and student exchange programmes				X
11	Redesign the faculty staff development programme	X			
12	Reinforce the Alumni office at the faculty			X	
13	Enhance research impact on teaching & learning			X	
14	Identify modules to be delivered in BUE London Campus.	X			
2. Research					
1	Develop new postgraduate programmes to support Egypt's development	X		X	
2	Embed entrepreneurial skills as an integral element within all postgraduate programmes			X	
3	Develop online registration application for postgraduate programmes			X	
4	Develop industrial training components within MEng postgraduate programmes			X	
5	Continue to support and expand the part-time Ph.D. scheme for the Faculty's Teaching				X

6	Assistants with UK partners				X
7	Develop Faculty-Science Park integration scheme			X	
8	Attract, develop, and support research active staff			X	
9	Attract significant research funds from external sources			X	
10	Attract UK and internationally leading figures for externally funded collaborative research activities				X
11	Attract international funding to support international events				X
12	Encourage publications in high impact research journals.			X	
3. Community Services and Enterprise					
1	Ensure suitability of offered programmes to market needs	X	X	X	X
2	Solicit industrial partners' recommendations regarding new engineering programmes		X	X	
3	Promote the establishment of start-ups for student innovations			X	
4	Design a range of informal learning platforms aimed at relevant industries			X	
5	Offer consulting services to relevant industries		X	X	
6	Develop integral scheme for Faculty-Science Park collaboration to support innovation			X	
7	Identify multi-national companies that would establish R&D offices at the Science Park			X	X
8	Expand the Industrial Linkage Platform to employ resources available through the Science Park			X	
4. Enabling Structures					
1	Strengthen and embed Governance and Leadership across the Faculty	X	X	X	X
2	Increase our sources of revenue		X		
3	Ensure that our marketing, public relations, and communications activities are targeted to meet our developing activities		X	X	
4	Support a robust programme of maintenance and upgrading for classrooms and laboratories			X	
5	Strengthen and develop our data collection and analysis mechanisms, to inform planning and decision making.	X	X	X	X

5. Mapping matrix of Programme Aims (Objectives) & Graduates Attributes.

CEM Programme Objectives vs. CEM Prog. Graduate Attributes اهداف البرنامج مع مواصفات الخريج للبرنامج					
SERIAL	CEM Graduate Attributes	CEM Programme Objectives			
		1. To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyse complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional	2. To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Construction Engineering and Management.	3. To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or	4. To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status,
1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;	X	X	X	
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;	X	X	X	
3	Behave professionally and adhere to engineering ethics and standards;				X
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;	X	X	X	X
5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	X	X	X	
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;	X	X	X	
7	Use techniques, skills and modern engineering tools necessary for engineering practice;	X	X	X	
8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;				X
9	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;	X	X	X	
10	Demonstrate leadership qualities, business administration and entrepreneurial skills.	X	X	X	X

1a	Personal attributes such as adaptability, self-motivation, self-management, cultural awareness, honesty, and integrity.	**X**	**X**	**X**	**X**
2a	Functional skills such as effective use of language, numbers, and IT.	**X**	**X**	**X**	**X**
3a	Personal skills such as problem-solving, team work, understanding the organization, leadership, and innovation.	**X**	**X**	**X**	**X**

6. Mapping Matrix of Programme Aims (Objectives) vs Programme Competencies

CEM Programme Objectives vs. Programme Competencies																	
SERIAL	CEM Programme Objectives	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – CIVIL ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Bcem1	Bcem2	Bcem3	Bcem4	Ccem1	Ccem2
1	To provide students with a systematic understanding of the knowledgebase of Engineering; the ability to analyse complex issues both systematically and creatively, make sound judgment in the absence of complete data and communicate their conclusions clearly; the ability to be self-directed and innovative in tackling and solving problems; the independent learning ability necessary for continuing professional development.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	To offer a broad curriculum that provides state-of-the-art knowledge and practical skills in Construction Engineering and Managment.	X	X	X	X	X						X	X	X	X	X	X
3	To provide a learning environment that enables students of high innate ability to reach their full potential, personally and academically, so that on graduation they are free to choose from many different careers, and have the understanding, knowledge and personal maturity to make a rapid contribution to their chosen employment or research area.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	To provide a programme which meets the educational requirements of all the appropriate professional institutions, both national and in the UK, for Membership/Chartered Engineer status, respectively.										X						

7. Mapping matrix of Progamme Competencies vs. Graduate Attributes

CEM Programme Attributes vs. Programme Competencies																	
SERIAL	CEM Programme Attributes	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – CIVIL ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Bcem1	Bcem2	Bcem3	Bcem4	Ccem1	Ccem2
1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;	X	X	X	X						X	X	X	X	X	X	X
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;	X	X	X	X							X	X	X	X	X	X
3	Behave professionally and adhere to engineering ethics and standards;				X						X						
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;							X									
5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;					X	X	X		X	X						
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles;																
7	Use techniques, skills and modern engineering tools necessary for engineering practice;	X	X	X		X					X	X	X	X	X	X	X
8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;					X					X					X	X
9	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;								X								
10	Demonstrate leadership qualities, business administration and entrepreneurial skills.									X	X						

1a	Personal attributes such as adaptability, self-motivation, self-management, cultural awareness, honesty, and integrity.					X	X	X	X	X	X						
2a	Functional skills such as effective use of language, numbers, and IT.								X								
3a	Personal skills such as problem-solving, team work, understanding the organization, leadership, and innovation.	X						X	X	X	X	X	X			X	X

8. CEM Programme - Mapping matrix of Courses vs. Programme Competencies (include Prep Year)

CEM Modules vs. CEM Programme Competencies																			
	SERIAL	**Module**	**Code**	**NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)**										**NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – Civil ENGINEERING Specialization (B)**				**UK Requirements for Programme (ARS) (C)**	
				A1	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**Bcem1**	**Bcem2**	**Bcem3**	**Bcem4**	**Ccem1**	**Ccem2**
Prep Semester 1	**1**	Mathematics for Engineers (1)	SCIB01P	x				x				x							
	2	Introductory Physics	SCIB02P		x				x		x								
	3	Engineering Mechanics *	MECH01P	x	x			x											
	4	Chemistry for Engineers *	CHME01P		x	x				x									
	5	Introduction to Computing *	COMP01P				x						x						
	6	English for Academic Purposes	ENGENGL01								x	x	x						
	7	Engineering Ethics and Human Rights *	ENGG01P				x			x	x								
Prep Semester 2	**8**	Mathematics for Engineers (2)	SCIB03P	x				x				x							
	9	Electricity and Magnetism	SCIB04P		x					x	x								
	10	Algebra and Geometry *	SCIB05P	x		x		x											
	11	Engineering Drawing & Descriptive Geometry*	MECH02P			x	x				x								
	12	Production Technology I *	MECH03P			x	x	x											
	13	English and Academic Writing	ENGENGL02					x		x	x	x	x						
DY1 Semester 1	**14**	Construction Technology and Building Services	CEM01C				x		x		x		x					x	x
	15	Engineering Drawing	CEM02C							x	x								
	16	Surveying for Construction Engineers	CEM04C		x		x		x	x	x		x	X					
	17	Introduction to Construction Engineering Materials	CEM12C	x	x	x				x	x		x	x					
	18	Engineering Mechanics	CEM15C	x	x								x	x					
	19	Calculus	SCIB01C	x	x			x					x						
DY1 Semester 2	**20**	Technical Writing	CEM11C		x			x		x	x								
	21	Differential Equations	SCIB02C	x	x			x					x						
	22	Theory of Structures for Construction Engineers (1)	CEM03C	x	x	x				X	x		x		x				
	23	Hydraulics for Construction Engineers	CEM13C	x	x			x	x		x			x	x				
	24	Computer Aided Drafting (CAD)	CEM14C							X	x		x					x	
	25	Properties and Testing of Construction Materials	CEM06C	X	x					x	x			x	x				
DY2 Semester 1	**26**	Soil Mechanics for Construction Engineers	CEM05C	x	X	X	X	X		x	x			X				X	
	27	Theory of Structures for Construction Engineers (2)	CEM07C	X	x					x	x	x	x	X	X				
	28	Computer Applications in Construction	CEM09C	x	x		x			x	x		x	X	X			x	x
	29	Quantity Surveying, Estimation and Specifications	CEM10I	x			x		x		x	x					x	x	x

	30	Principles of Management	CEM17C				x		x								x	x	x
	31	Engineering Economy	CEM18I			x	x		x	x	x	x					x		x
DY2 Semester 2	**32**	Statistics for Engineers	SCIB03I	x	x			x		x	x		x						
	33	Building Information Modelling (BIM)	CEM01I	x	x				x	x		x		x				x	
	34	Structural Steel Design for Construction Engineers	CEM04I		x	x	x	x	x	x	x				x	x		x	
	35	Construction Contracts	CEM03I					x		X	x	x	x			x	x	x	x
	36	Water Distribution and Sewerage System	CEM09I		x	x	x		x	x	x				x	x			
	37	Fundamentals of Reinforced Concrete	CEM07I		x	x	X	X		x	x	x	x	X	x	x		X	
	38	Industrial Training Placement (1)	ENGG03I					x	x	x	x	x	x			x	x		
DY3 Semester 1	**39**	Foundation Engineering for Construction Engineers	CEM06I			x	x			x	x	x	x	x	x	x		X	
	40	Reinforced Concrete Design for Construction Engineers	CEM11I		x	x	x	x		x	x	x	x	X	x	x		x	
	41	Construction Management (1)	CEM20I			x	x		x	x	x	x	x	x		x	x	x	
	42	Water Resources Engineering and Management	CEM13I			x	x		x	x	x				x	x			
	43	Financial Management in Construction	CEM15I	x				x			x	x	x			x		x	
	44	Construction Methods (1)	CEM08I	x			x				x	x					x	x	
DY3 Semester 2	**45**	Transport Systems	CEM12I			x	X		x	x	x				x				
	46	Construction Equipment	CEM01H	x			x				x	x					x	x	
	47	Water and Wastewater Treatment	CEM14I		x	x	x		x	x	x				x	x			
	48	Strategic Management in Construction	CEM25H		x	x	x	x	x	x	X	x	x			x	x		x
	49	Construction Management (2)	CEM09H			x	x		x	x	x	x	x	x		x	x	x	x
	50	Claims and Disputes in Construction	CEM02H					x			x	x	x			x	x	x	x
	51	Industrial Training Placement (2)	ENGG07H					x	x	x	x	x	x			x	x		
DY4	**52**	Individual Research Project	CEM30H	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	53	Group Construction Project	CEM27H	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
DY4 Semester 1	**54**	Optimization Techniques for Construction Applications	CEM20H	x						x	x	x	x			x		x	x
	55	Value and Risk Management in Construction	CEM26H		x	x	x	x	x	x	X	x	x			x	X	x	x
	56	Rehabilitation and Retrofitting of Structures	CEM28H	x	x		x		x	x				x	x			x	
	57	Environmental Engineering Management- Optional	CEM06H	x	x	x	x		x	x	x				x	x			
	58	Human Resource Management in Construction - Optional	CEM29H						x	x									
	59	Infrastucture Asset Management - Optional	CEM12H			x	x		x	x	x	x	x	x		x	x	x	x
	60	Quality and Safety Management in Construction - Optional	CEM33H			x	x		x							x		x	x

DY4 Semester 2	**61**	Sustainability and the Built Environment	CEM32H			x	x			x	x			x		x		x	x
	62	Construction Methods (2)	CEM14H	x			x				x	x						x	x
	63	Introduction to Simulation and AI Applications in Construction	CEM13H		x	x				x	x	x						x	x
	64	Transportation Planning - Optional Module	CEM16H		x	x			x	x	x	X	X		x				
	65	Management of Multiple Construction Projects - Optional	CEM17H			x	x		x	x	x	x	x	x		x	x	x	x
	66	Lean Construction - Optional	CEM31H			x	x							x		x		x	x
	67	Information Technology Applications in Construction - Optional	CEM34H		x	x				x	x	x						x	x

9. Teaching and Learning methods vs. Programme Competencies

Teaching and Learning Methods vs. CEM Programme Competencies

Teaching and Learning Methods	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – Civil ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Bcem1	Bcem2	Bcem3	Bcem4	Ccem1	Ccem2
Interactive Lectures	x			x			x				x	x		x	x	
Research	x	x	x		x		x	x	x		x	x	x	x	x	x
Collaborative Learning (Team Project)	x	x	x	x		x	x	x	x		x	x	x	x	x	
Tutorials	x	x		x			x				x	x		x	x	
Self study	x	x	x	x			x	x		x	x	x		x	x	
Labs	x	x					x	x							x	
Others	x															

10.Assessment methods vs Programme Competencies

Assessment Methods vs. CEM Programme Competencies

Teaching and Learning Methods	NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 ENGINEERING General (A)										NATIONAL ACADEMIC REFERENCE STANDARDS (NARS), 2ND EDITION, 2018 – Civil ENGINEERING Specialization (B)				UK Requirements for Programme (ARS) (C)	
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	Bcem1	Bcem2	Bcem3	Bcem4	Ccem1	Ccem2
Online Group Assignment	x		x													
Listening and Note-taking	x									x						
Speaking							x	x								
Writing Assignment				x	x			x								
Writing- academic essay								x								
Online Computer Based Project	x	x	x								x				x	
Group presentation			x	x			x	x				x			x	
Group project			x	x		x	x		x		x	x	x	x	x	
Class Test 1	x		x								x	x	x	x	x	
Individual report			x	x	x		x	x		x					x	
Individual presentation			x	x	x		x	x		x					x	
Individual project			x	x	x	x	x		x	x	x	x	x	x	x	
Individual portfolio (1)								x							x	
Practical Assessment		x														
Oral Assessment	x		x					x							x	
Design Brief (Supervisor)			x	x		x	x				x				x	
Lab Report		x														
Interim Report (Panel)			x		x		x		x	x			x	x	x	x
Student's Efforts(Supervisor)			x		x		x		x	x						x
Final Submission (Panel)			x	x	x		x		x	x			x	x		x
VIVA (Panel)			x	x	x		x			x						x
Unseen Exam	x			x							x	x	x	x	x	

11.Summary of revisions made to programme Modules.

Review Summary for the current programme modules				
	Code	**Credits**	**Name**	**Statues in the new programme**
DY1 / S1	CEM01C	10	Construction Technology and Management	**Combined with module CEM08C (Building Services)**
	CEM02C	10	Engineering Drawing	**No change**
	CEM04C	10	Geometrics in Surveying	**Changed title to Surveying for Construction Engineers and combined with part of module CEM05I (Geomatics)**
	CEM08C	10	Building Services	**Deleted**
	CEM12C	10	Introduction to Construction Engineering Materials	**Changed title to Strength of Materials**
	SCIB01C	10	Calculus	**No change**
DY1 / S2	CEM03C	10	Structural Analysis and Mechanics (1)	**Changed title to Theory of Structures for Construction Engineers (1)**
	CEM05C	10	Geotechnics and Engineering Geology	**Changed title to Soil Mechanics for Construction Engineers and combined with part of module CEM06I (Geothechnics) and moved to DY2/S1**
	CEM06C	10	Construction Engineering Materials	**Changed title to Properties and Testing of Construction Materials**
	CEM11C	10	Research and Communication Skills	**Changed title to Technical Writing and moved to DY1/S1**
	CEM13C	10	Fluid Mechanics	**Changed title to Hydraulics for Construction Engineers and combined with part of module CEM10C (Hydraulics)**
	SCIB02C	10	Differential Equations	**No change**
DY2 / S1	CEM09C	10	Computer Applications in Construction	**No change**
	CEM10C	10	Hydraulics	**Deleted**

Review Summary for the current programme modules

	Code	Credits	Name	Statues in the new programme
	SCIB03I	10	Statistics for Engineers	**Moved to DY2/S2**
	CEM07C	10	Structural Analysis and Mechanics (2)	**Changed title to Theory of Structures for Construction Engineers (2)**
	CEM17I	10	Principles of Management	**Changed code to CEM17C**
	CEM16C	10	Law in Construction	**Deleted**
DY2 / S2	CEM10I	10	Quantity Surveying, Estimation and Specifications	**Moved to DY2/S1**
	CEM02I	10	Construction Equipment	**Changed code to CEM01H moved to DY3/S2**
	CEM04I	10	Structural Steel Design (1)	**Changed title to Structural Steel Design for Construction Engineers and combined with part of module CEM03H (Structural Steel Design 2)**
	CEM06I	10	Geotechnics	**Changed title and to Foundation Engineering for Construction Engineers and combined with part of module CEM05H (Foundation Engineering) moved to DY3/S1**
	CEM05I	10	Geomatics	**Deleted**
	CEM07I	10	Reinforced Concrete Design (1)	**Changed title to Fundamentals of Reinforced Concrete**
DY3 / S1	CEM20I	10	Construction Planning and Scheduling	**Changed title to Construction Management 1**
	CEM19I	10	Management Information System	**Deleted**
	CEM09I	10	Water Distribution and Sewerage System	**Moved to DY2/S2**
	CEM18I	10	Construction Economics and Financial Management	**Changed title to Engineering Economy and moved to DY2/S1**
	CEM11I	10	Reinforced Concrete Design (2)	**Changed title to Reinforced Concrete Design for Construction Engineers**

Review Summary for the current programme modules				
	Code	**Credits**	**Name**	**Statues in the new programme**
	CEM05H	10	Foundation Engineering	**Deleted**
DY3 / S2	CEM12I	10	Transport Systems	**No change**
	CEM03H	10	Structural Steel Design (2)	**Deleted**
	CEM13I	10	Irrigation Works Design (1)	**Changed title to Water Resources Engineering & Management and moved to DY3/S1**
	CEM14I	10	Water and Wastewater Treatment	**No change**
	CEM09H	10	Project Management	**Changed title to Construction Management 2**
	CEM23H	10	Construction Contract Procedures	**Changed code to CEM03I, changed title to Construction Contracts and moved to DY2/S2**
DY4 / S1 (Core)	CEM30H	10	Research Graduation Project [1:1]	**No change**
	CEM27H	10	Construction Graduation Project [1:1]	**No change**
	CEM28H	10	Rehabilitation and Retrofitting of Structures	**No change**
	CEM29H	10	Human Resources Management in Construction	**Moved to be optional module**
	CEM25H	10	Strategic Management in Construction	**Moved to DY3/S2**
DY4 / S1 (Optional)	CEM07H	10	Advanced Irrigation Works Design	**Deleted**
	CEM08H	10	Highway and Airport Engineering	**Deleted**
	CEM18H	10	Advanced Strength of Materials	**Deleted**
	CEM15H	10	Pavement Design	**Deleted**
	CEM21H	10	Earthquake Resistant Design	**Deleted**
DY4 / S2 (Core)	CEM30H	10	Research Graduation Project [1:1]	**No change**
	CEM27H	20	Construction Graduation Project [1:1]	**No change**
	CEM32H	10	Sustainability and Built Environment	**No change**

Review Summary for the current programme modules				
	Code	**Credits**	**Name**	**Statues in the new programme**
	CEM31H	10	Lean Construction	**Moved to be optional module**
	CEM26H	10	Value and Risk Management in Construction	**Moved to DY4/S1**
DY4 / S2 (Optional)	CEM16H	10	Transportation Planning	**No change**
	CEM10H	10	Advanced Reinforced Concrete Design	**Deleted**
	CEM11H	10	Bridge Engineering	**Deleted**
	CIVL04H	10	Geoinformatics	**Deleted**

Review Summary for the added programme modules				
	Code	Credits	Name	Statues in the new programme
DY1 / S2	CEM15C	10	Engineering Mechanics	**New**
DY1 / S2	CEM14C	10	Computer Aided Drafting (CAD)	**New**
DY2 / S2	CEM01I	10	Building Information Modelling (BIM)	**New**
DY3 / S1	CEM15I	10	Financial Management in Construction	**New**
DY3 / S1	CEM08I	10	Construction Methods 1	**New**
DY3 / S2	CEM02H	10	Claims & Disputes in Construction	**New**
DY4 / S1	CEM20H	10	Optimization Techniques for construction applications	**New**
DY4 / S1 (Optional)	CEM06H	10	Environmental Engineering Management	**New**
DY4 / S1 (Optional)	CEM12H	10	Infrastructure Asset Management	**New**
DY4 / S1 (Optional)	CEM33H	10	Quality and Safety Management in construction	**New**
DY4 / S2	CEM13H	10	Introduction to Simulation & AI applications in Construction	**New**
DY4 / S2	CEM14H	10	Construction Methods 2	**New**

DY4 / S2 (Optional)	CEM17H	10	Management of multiple construction projects	**New**
DY4 / S2 (Optional)	CEM34H	10	Information Technology Applications in Construction	**New**

	Previous Accreditation			Proposed Changes			Comments
	Code	Credits	Name	Code	Credits	Name	
DY1 / S1	CEM01C	10	Construction Technology and Management	**CEM01C**	10	Construction Technology and Building Services	**New, Eqv (01C, 08C)**
	CEM02C	10	Engineering Drawing	**CEM02C**	10	Engineering Drawing	Old
	CEM04C	10	Geometrics in Surveying	**CEM04C**	10	Surveying for Construction Engineers	**New, Eqv (04C,05I)**
	CEM08C	10	Building Services	**CEM15C**	10	Engineering Mechanics	**New**
	CEM12C	10	Introduction to Construction Engineering Materials	**CEM12C**	10	Strength of Materials	**New, Eqv (12C)**
	SCIB01C	10	Calculus	**SCIB01C**	10	Calculus	Old
DY1 / S2	CEM03C	10	Structural Analysis and Mechanics (1)	**CEM03C**	10	Theory of Structures for Construction Engineers (1)	**New, Eqv (03C)**
	CEM05C	10	Geotechnics and Engineering Geology	**CEM11C**	10	Technical Writing	**New, Eqv (11C)**
	CEM06C	10	Construction Engineering Materials	**CEM06C**	10	Properties and Testing of Construction Materials	**New, Eqv (06C)**
	CEM11C	10	Research and Communication Skills	**CEM14C**	10	Computer Aided Drafting (CAD)	**New**
	CEM13C	10	Fluid Mechanics	**CEM13C**	10	Hydraulics for Construction Engineers	**New, Eqv (13C,10C)**
	SCIB02C	10	Differential Equations	**SCIB02C**	10	Differential Equations	Old
DY2 / S1	CEM09C	10	Computer Applications in Construction	**CEM09C**	10	Computer Applications in Construction	Old
	CEM10C	~~10~~	Hydraulics	**CEM10I**	10	Quantity Surveying, Estimation and Specifications	Old (moved from Y2-S2 to Y2-S1)
	SCIB03I	10	Statistics for Engineers	**CEM05C**	10	Soil Mechanics for Construction Engineers	**New, Eqv (05C,06I)**
	CEM07C	10	Structural Analysis and Mechanics (2)	**CEM07C**	10	Theory of Structures for Construction Engineers (2)	**New, Eqv (07C)**
	CEM17I	10	Principles of Management	**CEM17C**	10	Principles of Management	**New, Eqv (17I)**
	CEM16C	10	Law in Construction	**CEM18I**	10	Engineering Economy	**New, Eqv (18I)**

DY2 / S2	CEM10I	10	Quantity Surveying, Estimation and Specifications	**CEM01I**	10	Building Information Modeling (BIM)	**New**
	CEM02I	10	Construction Equipment	**CEM09I**	10	Water Distribution and Sewerage System	Old (moved from Y3-S1 to Y2-S2)
	CEM04I	10	Structural Steel Design (1)	**CEM04I**	10	Structural Steel Design for Construction Engineers	**New, Eqv (04I,03H)**
	CEM06I	10	Geotechnics	**SCIB03I**	10	Statistics for Engineers	Old (moved from Y2-S1 to Y2-S2)
	CEM05I	10	Geomatics	**CEM03I**	10	Construction Contracts	**New, Eqv (23H)**
	CEM07I	10	Reinforced Concrete Design (1)	**CEM07I**	10	Fundamentals of Reinforced Concrete	**New, Eqv (07I)**
DY3 / S1	CEM20I	10	Construction Planning and Scheduling	**CEM20I**	10	Construction Management 1	**New, Eqv (20I)**
	CEM19I	~~10~~	Management Information System	**CEM15I**	10	Introduction to Financial Management	**New, Eqv (18I)**
	CEM09I	10	Water Distribution and Sewerage System	**CEM06I**	10	Foundation Engineering for Construction Engineers	**New, Eqv (06I,05H)**
	CEM18I	10	Construction Economics and Financial Manag.	**CEM08I**	10	Construction Methods 1	**New**
	CEM11I	10	Reinforced Concrete Design (2)	**CEM11I**	10	Reinforced Concrete Design for Construction Engineers	**New, Eqv (11I)**
	CEM05H	~~10~~	Foundation Engineering	**CEM13I**	10	Water Resources Engineering & Management	**New, Eqv (13I)**
DY3 / S2	CEM12I	10	Transport Systems	**CEM12I**	10	Transport Systems	Old
	CEM03H	10	Structural Steel Design (2)	**CEM01H**	10	Construction Equipment	**New, Eqv (02I)**
	CEM13I	10	Irrigation Works Design (1)	**CEM25H**	10	Strategic Management in Construction	Old (moved from Y4-S1 to Y3-S2)
	CEM14I	10	Water and Wastewater Treatment	**CEM14I**	10	Water and Wastewater Treatment	Old
	CEM09H	10	Project Management	**CEM09H**	10	Construction Management 2	**New, Eqv (09H)**
	CEM23H	~~10~~	Construction Contract Procedures	**CEM02H**	10	Claims & Disputes in Construction	**New**
DY4 / S1 (Core)	CEM30H	10	Research Graduation Project [1:1]	**CEM30H**	10	Research Graduation Project [1:1]	Old
	CEM27H	10	Construction Graduation Project [1:1]	**CEM27H**	10	Construction Graduation Project [1:1]	Old
	CEM28H	10	Rehabilitation and Retrofitting of Structures	**CEM28H**	10	Rehabilitation and Retrofitting of Structures	Old

	CEM29H	10	Human Resources Management in Construction	**CEM26H**	10	Value & Risk management in Construction.	Old (moved from Y4-S2 to Y4-S1)
	CEM25H	10	Strategic Management in Construction	**CEM20H**	10	Optimization Techniques for construction applications	**New**
DY4 / S1 (Optional)	CEM07H	10	Advanced Irrigation Works Design	**CEM29H**	10	Human Resources Management in Construction	Old (changed from Core to Optional Module)
	CEM08H	10	Highway and Airport Engineering	**CEM06H**	10	Environmental Engineering Management	**New**
	CEM18H	10	Advanced Strength of Materials	**CEM12H**	10	Infrastructure Asset Management	**New**
	CEM15H	10	Pavement Engineering	**CEM33H**	10	Quality and Safety Management in construction	**New**
DY4 / S2 (Core)	CEM30H	10	Research Graduation Project [1:1]	**CEM30H**	10	Research Graduation Project [1:1]	Old
	CEM27H	20	Construction Graduation Project [1:1]	**CEM27H**	20	Construction Graduation Project [1:1]	Old
	CEM32H	10	Sustainability and Built Environment	**CEM32H**	10	Sustainability and Built Environment	Old
	CEM31H	10	Lean Construction	**CEM13H**	10	Introduction to Simulation & AI applications in Construction	**New**
	CEM26H	10	Value and Risk Management in Construction	**CEM14H**	10	Construction Methods 2	**New**
DY4 / S2 (Optional)	CEM16H	10	Transportation Planning	**CEM16H**	10	Transportation Planning	Old
	CEM10H	10	Advanced Reinforced Concrete Design	**CEM31H**	10	Lean Construction	Old (changed from Core to Optional Module)
	CEM11H	10	Bridge Engineering	**CEM17H**	10	Management of multiple construction projects	**New**
	CIVL04H	10	Geoinformatics	**CEM34H**	10	Information Technology Applications in Construction	**New**

مواصفات برنامج الهندسة الكهربية والإتصالات

Specifications of the Electrical Engineering and Communications Programme:

Career Prospects

The electrical engineering and communications programme graduates have a proven reputation in every career path they pursue. The program graduates are recruited in companies covering several ICT industries, namely in IT, mobile operators, consumer electronics, and IC companies. In advanced research, many of the programme's graduates have continued research in England, Germany, USA, and Canada. The electrical engineering and communications programme continually strives to prepare graduates to:

- Design of communication systems, components, through skilful, and innovative methodologies, meanwhile adhering to the highest ethical standards.
- Make efficient use of analytical reasoning and state-of-the-art approaches based on the engineering sciences and practices.
- Engage professionally in their areas of experience and show advanced technical skills.
- Acquire technical and managerial leadership positions in their chosen careers.

The electrical engineering and communications programme graduates successfully managed to join many companies and research centres, either locally or internationally. Our graduates fit in many companies, such as: WE, Orange, Vodafone, Eitsalat, Si-Ware, Siemens EDA, Dell, and Valeo.

This specification provides the main features of the programme competencies that a typical student might reasonably be expected to achieve and demonstrate if full advantage is taken of the learning opportunities that are provided.

1. Basic Information

1	**Programme title**	**Electrical Engineering and Communications**
2	**Name of the final award**	**BSc with honours [validated by UK partner]**
3	**Awarding body/institution**	**The British University in Egypt**
4	**Faculty**	**Engineering**
5	**Department**	**Electrical**
6	**Dean**	**Prof. Maguid Hassan**
7	**Head of Department (HoD)**	**Prof. Hani Ghali**
8	**Programme Director (PD)**	**Dr. Sameh Osama**
9	**Professional, Statutory and Regulatory Body Accreditation**	**Egyptian Engineering Syndicate**
10	**Date of initial internal review and updates**	**March 2017**
11	**Approval Date to adopt NARS 2018 by:** **Departmental Council** **Faculty Council**	 - **21st September 2020** - **10th October 2020**

2. Programme Mission

The mission of Electrical Engineering & Communications Programme includes the followings:

- Provide highest quality, up-to-date education based with British ethos corresponding to the QAA standards in the fields of modern electronics and communications technologies.
- Equipe graduates from the electrical and communications engineering programme with adequate long-life learning skills.
- Enable graduate from the electrical and communications engineering programme with potential job opportunities on both the national as well as the international job market.
- Produce high level research outcomes in the domain the specialization.

3. Programme Aims (Objectives)

The aims of this programme are to:

- Continuously update the programme to incorporate recent trends in the field of specialization.
- Establish cooperation protocols with industrial enterprises, educational and research institutes.
- Develop postgraduate programme in focus areas related to the field of specialization.
- Continue the improvement of research outcomes.
- Apply for and acquire external funding either from national or international funding entities.
- Provide the job market with a competent graduate who is able to excel in recent technologies in the field of specialization.

4. Distinctive Features of the Programme

The BUE delivers programmes based on a British philosophy of education. This results in programme that is very much focused on the students rather than those who deliver the material. Graduates from UK programmes typically exhibit:

- the ability to think creatively and with strong problem-solving skills.
- high level key and transferable skill sets.
- the ability to maintain independently a high level of professional and subject specific competence (often through CPD).
- technical competence.
- the ability to consider problems at a high level (i.e., to see the big picture);
- diligence and ethical working practices.
- the ability to work both independently and as part of a team.
- flexibility and the ability to apply their subject-specific knowledge to fields outside their own.

The BUE Mission is to be the leading provider of high-quality UK style education in the MENA region. The University is committed to ensuring UK validation of its programmes and to ensure a student experience that is in line with UK standards. Built on top of institutional quality assurance is subject level validation and the faculty is committed to ensuring that its UK validating partners confirm that its degree programme is in line with UK standards. An outcome of this will be the dual award of both an Egyptian BSc and a BSc from a UK validating partner in Electrical Engineering and Communications.

Furthermore, we will be seeking accreditation of this degree programme with the IET "*The Institution of Engineering and Technology*", the UK's leading professional body for this programme discipline.

Accredited degree programmes are the preferred and fast track routes for those who aim to obtain the professional qualification of membership in the Institution of Engineering and Technology (IET).

At the time of writing, and to the best of our knowledge, this combination of academic and professional accreditation makes our programme in Electrical Engineering and Communications quite unique in both Egypt and the surrounding region.

5. Relevant Subject Benchmark Statements and other External and Internal Reference Points Used to achieve Programme Outcomes

To ensure that the programme complies with the requirements of relevant national and international professional institutions/bodies, and to qualify graduates to apply for memberships in respective institutions and/or gain Chartered Engineer status, the following are used as reference points to inform the programme outcomes:

- National Academic Reference Standards (NARS 2018) developed by The National Authority of Quality Assurance and Accreditation of Education (NAQAAE), https://admin.naqaae.eg/api/v1/archive/download/34733
- The UK Standard for Professional Engineering Competence and Commitment (UK-SPEC), The revised fourth edition of UK-SPEC was published on 31 August 2020 and implemented by 31 December 2021, https://www.engc.org.uk/standards-guidance/standards/uk-spec/fourth-edition-implemented-from-31-december-2021/
- Engineering Council, The Accreditation of Higher Education Programmes (AHEP), Fourth Edition, https://www.engc.org.uk/media/3464/ahep-fourth-edition.pdf
- The IET-AHEP Publications; “Guidance on how to meet the Learning Outcome requirements for Accreditation” and “Accreditation of HE Programmes (AHEP): Collated learning outcomes for six areas of learning” available at; http://www.theiet.org/academics/accreditation/policy-guidance/
- Subject Benchmark Statement: Engineering, https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/subject-benchmark-statement-engineering.pdf?sfvrsn=1f2c881_16

- The Electrical Engineering and Communications Programme originally adopted NARS 2009 and upon the issuing of national Academic Reference Standards (NARS 2018 for Engineering 2nd edition), the programme performed a gap analysis with additional action plan to bridge all gaps if any. Hence, the programme specifications are updated to comply with National Academic Reference Standards (NARS 2018) developed by The National Authority of Quality Assurance and Accreditation of Education (NAQAAE). https://admin.naqaae.eg/api/v1/archive/download/34733

6. Graduate Attributes

The creative way of approaching all engineering challenges is being seen increasingly as a 'way of thinking' which is generic across all disciplines. The Electrical Engineering and Communications Programme adopted the NARS 2018 attributes for Engineering. The graduates of Electrical Engineering and Communications Programme should have the ability to:

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.
2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.
3. Behave professionally and adhere to engineering ethics and standards.
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.
7. Use techniques, skills, and modern engineering tools necessary for engineering practice.
8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.
9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.
11. Develop appropriate research skills in the field of Electrical Engineering and Communications.
12. Master the use of industry-standard specialized relevant Electronic Design Automation (EDA) software tools.

University Requirements

The university is considered a core of Human Thinking at its highest level, and the source of investment and development of human resources. It is concerned with the rise of the Arabian Civilization and the Historical Heritage of the Egyptian Society, and its traditions. It is also concerned with the education of Religion, Morals and Nationalism (Egyptian National Law for Universities, Law 49 for Year 1972). Therefore, BUE graduates should be able to or aware of:

- National, regional, and international contemporary issues, to have an intellectual and enlightened personality and to interact effectively in the community through different communication skills.
- To achieve this goal, BUE has designed several courses planned to build the student personality, develop his/her skills, and increase his/her awareness of different topics. These courses are listed in Table 6.

Faculty Requirements

The Electrical Engineering and Communications Programme offered at the Faculty of Engineering, the British University in Egypt, is an Engineering Programme. The graduates have the privilege of being Engineers and are automatically enrolled in the Egyptian Engineering Syndicate (EES).

Competencies for Engineering Graduates

According to the **National Academic Reference Standards (NARS-2018),** the **<u>Engineering Graduate must be able to (A-Level):</u>**

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.

A2. Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.

A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.

A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.

A5. Practice research techniques and methods of investigation as an inherent part of learning.

A6. Plan, supervise and monitor implementation of engineering projects.

A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.

A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

A9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.

A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

- Modules (courses) required to achieve these competencies (A-level) are listed in Table

Discipline Requirements (Electrical Engineering Requirements)

According to the National Academic Reference Standards (NARS-2018), Electrical Engineering and Communications Programme graduates must meet specific competencies. Thus, in addition to the Competencies of all Engineering Programmes (A-Level), the Electrical Engineering and Communications Programme graduate must be able to (B-Level):

B1. Select, model, and analyse electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.

B2. Design, model and analyse an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

B3. Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.

B4. Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.

B5. Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and Services.

- Courses required to achieve these competencies (B-level) are listed in Table 8.

Programme Competencies for UK Requirements:

The Electrical Engineering and Communications Programme adopted the National Reference Standards (NARS) issued in 2018 at the level of competencies (A & B) considering A as general competencies for all engineers and B as specialized competencies for electrical engineers. Given the requirements of the British partner, the Programme also adopted (ARS) at the level of (C) to meet the requirements of (UK-SPEC), fourth edition, and AHEP, fourth edition:

C1. Develop innovative solutions for the practical industrial problems.

C2. Proposing various solutions for communication engineering applications in business/industrial problems. Cost-benefit analysis should be performed especially in sensitive domains where direct and indirect costs are involved.

C3. Practice computer programming for the design and diagnostics of different types of communications systems, coding, and decoding systems.

C4. Apply probabilistic methods and statistics to electrical and communication engineering problems.

- Courses required to achieve these competencies (C-level) are listed in Table 9.

7. Programme Structure, Levels, Modules, Credits and Awards.

Credit Point System

- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) to be awarded a UK validated degree. This is in addition to the specialist courses (modules) and other requirements of the Egyptian Supreme Council of Universities required for the Egyptian degree.
- The programme is divided into teaching units called modules (courses), which are each assigned a credit weighting.
- Each course is assigned a Level, number of credits and weighting, this reflects the depth of learning required in the relevant programme year.

- A basic 10-credit course requires approximately 100 hours of student effort, which can include 36 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study, and assessment.
- Students study courses with a combined weight of 120 credit points in each year (60 credit points per semester)
- Courses that are delivered in one semester have their assessment completed within the semester in which they are taught. The programme is structured such that formal examinations can take place at the end of each semester.

Academic Semesters

- The academic year is divided into two semesters: Semester 1 and Semester 2.
- Each semester is 15-weeks in length.
- Week 13 being a revision week, and weeks 14- 15 being assessment weeks at the end of each semester.
- The Academic year includes a summer assessment period where students can resit-failed courses.

Article (10): Programme Levels

- The whole programme, of total 600 credit points, is divided into four levels P, C, I and H (120 for P and 160 for each of C, I and H), according to the Framework for Higher Education Qualifications of UK Degree-Awarding Bodies.
- These levels reflect the depth of learning required in the relevant programme year.
- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) of the UK Degree-Awarding Bodies to be awarded a UK validated degree, in addition to the Egyptian degree.
- Each programme is also divided into **four levels of competencies, as per the NARS 2018**, as follows:

  o Level (0) University requirements
  - Level (A) Faculty requirements
  - Level (B) Discipline requirements
  - Level (C) Programme requirements

Article (11): Duration of Study

- The duration of Study is five years (10 semesters) including a Preparatory Year.

Article (13): Programme Structure

- All taught undergraduate programmes at BUE are modular in structure.
- The Electrical Engineering and Communications Programme is assigned as a credit weighting. A basic 10-credit course requires approximately 100 hours of student effort, which can include 35 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study, and assessment. The maximum credit weighting for any one course is normally 20 credits.
- Courses that are delivered over two semesters have 20-50% of their assessment completed in semester one and the remainder in semester two,

8. Conformity of the Electrical Engineering and Communications Programme to Supreme Council of Universities (SCU) Guidelines

The SCU guidelines consists of seven major categories that run throughout the whole programme; namely: Human and Social Sciences; Mathematics and Basic Science, Basic Engineering Science, Applied Engineering Sciences, Computer Applications and ICT, Projects and Practice and Discretionary (Institution character- identifying) Subject with range of weights of [9-12%], [20-26%], [20-23%], [20-22%], [9-11%], [8-11%], and [6-8%] respectively. The credits contribution, of the major categories in the Electrical Engineering and Communications Programme is presented as follows:

Table 4 Indicative Curricula Content by Subject Area

Total no. of hrs / programme = ………..											
Curricula Content by Subject Area		Number of Courses	No of Course / levels					Total no. of hrs / subject area	% of subject area	Total % of NARS
			Prep year	DY1 (hrs)	DY2 (hrs)	DY3 (hrs)	DY4 (hrs)			
A	Humanities and social Science	7	25	20	10	10	0	65	10.8%	9-12
B	Mathematics and Basic Science	12	70	20	20	10	0	120	20.0%	20-26
C	Basic Engineering Science	12	20	50	60	10	0	140	23.0%	20-23
D	Applied Engineering and Design	13	0	20	20	60	30	130	21.6%	20-22
E	Computer Applications and ICT	6	5	10	10	30	0	55	9.1%	9-11
F	Projects and Practice	4	0	0	0	0	50	50	8.3%	8-11
G	Discretionary (Institution character-identifying) Subject	3	0	0	0	0	40	40	6.0%	6-8
	Total No. of hrs /DY	57	120	120	120	120	120	600	100.0%	

Table 5 Major Categories of the Electrical Engineering and Communications Programme

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
University Requirements										
Prep	ENGENGL01	English for Academic Purposes	10	X						
Prep	ENGENGL02	English & Academic Writing	10	X						
DY1	ECE12C	Computer Programming	10					X		
DY1	ECE03C	Report Writing and Data Presentation	10	X						
DY1	ENGG01C	Engineering Project Management	10	X						
Level A: Faculty Requirements										
Prep	SCIB01P	Mathematics for Engineers (1)	10		X					
Prep	SCIB02P	Introductory Physics	10		X					
Prep	MECH01P	Engineering Mechanics	10		X					
Prep	CHME01P	Chemistry for Engineers	10		X					
Prep	COMP01P	Introduction to Computing	5					X		
Prep	ENGG01P	Engineering Ethics and Human Rights	5	X						
Prep	SCIB03P	Mathematics for Engineers (2)	10		X					
Prep	SCIB04P	Electricity and Magnetism	10		X					
Prep	SCIB05P	Algebra and Geometry	10		X					
Prep	MECH02P	Engineering Drawing and Descriptive Geometry	10			X				
Prep	MECH03P	Production Technology I	10			X				
DY1	SCIB01C	Calculus	10		X					
DY1	SCIB02C	Differential Equations	10		X					

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
Level B: Discipline (Electrical Engineering) Requirements										
DY1	ECE01C	Electric Circuits (1)	10			X				
DY1	ECE02C	Solid State Electronics	10			X				
DY1	ENGG03C	Entrepreneurship: Theory and Practice	10	X						
DY1	ECE04C	Electric Circuits (2)	10			X				
DY1	ECE05C	Electronics (1)	10			X				
DY1	ECE10C	Digital Design	10					X		
DY1	ECE06C	Signals and Systems	10					X		
DY2	ECE02I	Electronics (2)	10			X				
DY2	ECE08C	Electromagnetic Fields (1)	10			X				
DY2	SCIB06C	Probability and Statistics	10		X					
DY2	ECE03I	Maths for Communications	10			X				
DY2	ECE07C	Electrical Power	10				X			
DY2	ECE14C	Computer Organization	10			X				
DY2	ECE05I	Electronic Measurement and Instrumentation	10				X			
DY2	ECE14I	Computer Architecture	10					X		
DY2	ECE12I	Analog Communications	10			X				
DY2	ECE13I	Electromagnetic Fields (2)	10			X				
DY2	ECE04I	E&C: Law, Standards and Practice	10		X					
DY2	SCIB20I	Applied Numerical Techniques	10		X					
DY3	ECE16I	Digital Communications (1)	10				X			
DY3	ECE17I	Electromagnetic Waves	10			X				
DY3	ENGG07I	Engineering Economics	10	X						
DY3	ECE15I	Control Systems	10			X				
DY3	ECE18I	Electronics (3)	10				X			
DY3	ECE21I	Digital Electronics	10				X			

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
Level C: Programme (Electrical Engineering and Communications Engineering) Requirements										
DY3	ECE19I	Computer Networks	10					X		
DY3	ECE19H	Digital Control	10				X			
DY3	ECE20H	Digital Communications (2)	10				X			
DY3	ECE21H	Microwave Engineering	10				X			
DY3	ECE22H	Digital Signal Processing	10				X			
DY3	ECE20I	Optical Systems	10				X			
DY4	ECE24H	Research Project [1:1]	20							X
DY4	ECE25H	Design Project [1:1]	20							X
DY4	ECE26H	Digital Communications (3)	10				X			
DY4	ECE27H	Antennas and Propagation (1)	10				X			
DY4	ECE28H	Digital Communications (4)	10				X			
DY4	ECE29H	Embedded Systems	10						X	
DY4		Optional course (1)	10						X	
DY4		Optional course (2)	10						X	
DY4		Optional course (3)	10						X	
DY4		Optional course (4)	10						X	
Optional Courses										
DY4	ECE30H	Network Synthesis	10							
DY4	ECE31H	Fibre Optic Communications	10							
DY4	ECE32H	Energy Harvesting Systems	10							
DY4	ECE33H	Artificial Intelligence	10							
DY4	ECE34H	Digital Image Processing	10							
DY4	ECE35H	Optoelectronics	10							
DY4	ECE36H	Wireless Communications	10							
DY4	ECE37H	VLSI Technology	10							
DY4	ECE38H	RF Systems Design	10							
DY4	ECE39H	Mobile Communications	10							
DY4	ECE40H	Antennas and Propagation (2)	10							
DY4	ECE41H	Wireless Sensor Networks	10							
DY4	ECE42H	Radar System and Tracking	10							
DY4	ECE43H	Software Defined Radio	10							
DY4	ECE44H	Selected Topics in Communications Engineering	10							
DY4	ECE45H	Selected Topics in Electronics Engineering	10							
		Total	600	65	120	140	130	55	50	40
		%	100	10.8	20.0	23.0	21.6	9.1	8.3	6.0

Programme Courses

Courses required to achieve the University Requirements

Table 6 List of University requirements courses.

Code	Course Title	Cr.	Contact Hours			
			Lec	Tut	Lab	TT
ENGENGL01	English for Academic Purposes	10	2	2	0	4
ENGENGL02	English & Academic Writing	10	2	2	0	4
ECE12C	Computer Programming	10	2	0	3	5
ECE03C	Report Writing and Data Presentation	10	2	2	0	4
ENGG01C	Engineering Project Management	10	2	2	0	4
Total University Requirements		**50**	**10**	**8**	**3**	**21**

Courses Required to achieve the General Competencies of A-level (Faculty Requirements)

A set of courses must be completed as a Faculty Requirement. These courses are divided into Basic Science Courses and Basic Engineering Courses.

Table 7 List of Faculty requirements courses.

Code	Course Title	Cr.	Contact Hours			
			Lec	Tut	Lab	TT
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
MECH01P	Engineering Mechanics *	10	2	2	0	4
CHME01P	Chemistry for Engineers *	10	2	1	2	5
COMP01P	Introduction to Computing *	5	1	0	1	2
ENGG01P	Engineering Ethics and Human Rights *	5	2	0	0	2
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry *	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry *	10	2	3	0	5
MECH03P	Production Technology I *	10	2	2	0	4
SCIB01C	Calculus	10	2	2	0	4
SCIB02C	Differential Equations	10	2	2	0	4
Total Faculty of Engineering Requirements		**120**	**25**	**20**	**7**	**52**

Courses Required to achieve Electrical Engineering Requirements of B-level (Discipline Requirements):

A set of courses must be completed as a Basic Electrical Engineering Requirement, in the Electrical Engineering and Communications Programme.

Table 8 List of Discipline requirements courses (Electrical Engineering).

Code	Course Title	Cr.	Contact Hours			
			Lec	Tut	Lab	TT
ECE01C	Electric Circuits (1)	10	2	1	2	5
ECE02C	Solid State Electronics	10	2	2	0	4
ENGG03C	Entrepreneurship: Theory and Practice	10	2	2	0	4
ECE04C	Electric Circuits (2)	10	2	1	2	5
ECE05C	Electronics (1)	10	2	1	2	5
ECE10C	Digital Design	10	2	1	2	5
ECE06C	Signals and Systems	10	2	1	2	5
ECE02I	Electronics (2)	10	2	1	2	5
ECE08C	Electromagnetic Fields (1)	10	2	2	0	4
SCIB06C	Probability and Statistics	10	2	2	0	4
ECE03I	Maths for Communications	10	2	1	2	5
ECE07C	Electrical Power	10	2	1	2	5
ECE14C	Computer Organization	10	2	1	2	5
ECE05I	Electronic Measurement and Instrumentation	10	2	1	2	5
ECE14I	Computer Architecture	10	2	1	2	5
ECE12I	Analog Communications	10	2	1	2	5
ECE13I	Electromagnetic Fields (2)	10	2	2	0	4
ECE04I	E&C: Law, Standards and Practice	10	2	2	0	4
SCIB20I	Applied Numerical Techniques	10	2	2	0	4
ECE16I	Digital Communications (1)	10	2	1	2	5
ECE17I	Electromagnetic Waves	10	2	2	0	4
ENGG07I	Engineering Economics	10	2	2	0	4
ECE15I	Control Systems	10	2	1	2	5
ECE18I	Electronics (3)	10	2	1	2	5
ECE21I	Digital Electronics	10	2	1	2	5
Total Discipline: Electrical Engineering Requirements		**250**	**50**	**34**	**32**	**116**

Courses Required to achieve the Competencies of C-level (Programme Competencies for UK Requirements):

Courses Required to get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed:

Table 9 List of Programme requirements courses (Electrical Engineering and Communications).

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
	Faculty of Engineering Requirements	**120**	**25**	**20**	**7**	**52**
	Discipline: Electrical Engineering Requirements	**250**	**50**	**34**	**32**	**116**
University + Faculty + Discipline Requirements Total		**420**	**85**	**62**	**42**	**189**
	Programme Requirements					
ECE19I	Computer Networks	10	2	1	2	5
ECE19H	Digital Control	10	2	1	2	5
ECE20H	Digital Communications (2)	10	2	1	2	5
ECE21H	Microwave Engineering	10	2	2	0	4
ECE22H	Digital Signal Processing	10	2	1	2	5
ECE20I	Optical Systems	10	2	1	2	5
ECE24H	Research Project [1:1]	20	0	0	6	6
ECE25H	Design Project [1:1]	20	0	0	6	6
ECE26H	Digital Communications (3)	10	2	1	2	5
ECE27H	Antennas and Propagation (1)	10	2	1	2	5
ECE28H	Digital Communications (4)	10	2	1	2	5
ECE29H	Embedded Systems	10	2	1	2	5
	Optional course (1)	10	2	1	2	5
	Optional course (2)	10	2	1	2	5
	Optional course (3)	10	2	1	2	5
	Optional course (4)	10	2	1	2	5
Programme Requirements		**180**	**28**	**15**	**38**	**81**
Electrical Engineering and Communications Programme Requirements Total		**600**	**113**	**77**	**80**	**270**

Proposed Study Plan

To get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed.

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
Preparatory Year - Semester (1)						
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
MECH01P	Engineering Mechanics *	10	2	2	0	4
CHME01P	Chemistry for Engineers *	10	2	1	2	5
COMP01P	Introduction to Computing *	5	2	0	2	4
ENGENGL01	English and Academic Purposes	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights *	5	2	0	0	2
Total		**60**	**12**	**10**	**6**	**28**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
Preparatory Year - Semester (2)						
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry *	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry *	10	2	3	0	5
MECH03P	Production Technology I *	10	2	2	0	4
ENGENGL02	English and academic writing	10	0	4	0	4
Total		**60**	**10**	**14**	**2**	**26**

*** Modules that are taught to half the cohort in semester one and the other half in semester two.**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY1 - Semester (1)						
ECE01C	Electric Circuits (1)	10	2	1	2	5
ECE02C	Solid State Electronics	10	2	2	0	4
ECE03C	Report Writing and Data Presentation	10	2	2	0	4
SCIB01C	Calculus	10	2	2	0	4
ECE12C	Computer Programming	10	2	1	2	5
ENGG03C	Entrepreneurship: Theory and Practice	10	2	2	0	4
Total		**60**	**12**	**10**	**4**	**26**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY1 - Semester (2)						
ECE04C	Electric Circuits (2)	10	2	1	2	5
ECE05C	Electronics (1)	10	2	1	2	5
ECE10C	Digital Design	10	2	1	2	5
SCIB02C	Differential Equations	10	2	2	0	4
ECE06C	Signals and Systems	10	2	1	2	5
ENGG01C	Engineering Project Management	10	2	2	0	4
Total		**60**	**12**	**8**	**8**	**28**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY2 - Semester (1)						
ECE02I	Electronics (2)	10	2	1	2	5
ECE08C	Electromagnetic Fields (1)	10	2	2	0	4
SCIB06C	Probability and Statistics	10	2	2	0	4
ECE03I	Maths for Communications	10	2	1	2	5
ECE07C	Electrical Power	10	2	1	2	5
ECE14C	Computer Organization	10	2	1	2	5
Total		**60**	**12**	**8**	**8**	**28**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY2 - Semester (2)						
ECE05I	Electronic Measurement and Instrumentation	10	2	1	2	5
ECE14I	Computer Architecture	10	2	1	2	5
ECE12I	Analog Communications	10	2	1	2	5
ECE13I	Electromagnetic Fields (2)	10	2	2	0	4
ECE04I	E&C: Law, Standards and Practice	10	2	2	0	4
SCIB20I	Applied Numerical Techniques	10	2	1	2	5
Total		**60**	**12**	**8**	**8**	**28**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY2 - Summer Semester						
ENGG03I	Industrial Training Placement (1)	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY3 - Semester (1)						
ECE16I	Digital Communications (1)	10	2	1	2	5
ECE17I	Electromagnetic Waves	10	2	2	0	4
ENGG07I	Engineering Economics	10	2	2	0	4
ECE15I	Control Systems	10	2	1	2	5
ECE18I	Electronics (3)	10	2	1	2	5
ECE19I	Computer Networks	10	2	1	2	5
Total		**60**	**12**	**8**	**8**	**28**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY3 - Semester (2)						
ECE19H	Digital Control	10	2	1	2	5
ECE20H	Digital Communications (2)	10	2	1	2	5
ECE21H	Microwave Engineering	10	2	2	0	4
ECE22H	Digital Signal Processing	10	2	1	2	5
ECE20I	Optical Systems	10	2	1	2	5
ECE21I	Digital Electronics	10	2	1	2	5
Total		**60**	**12**	**7**	**10**	**29**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY3 - Summer Semester						
ENGG07H	Industrial Training Placement (2)	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY4 - Semester (1)						
ECE24H	Research Project [1:1]	10	0	0	6	6
ECE25H	Design Project [1:1]	10	0	0	6	6
ECE26H	Digital Communications (3)	10	2	1	2	5
ECE27H	Antennas and Propagation (1)	10	2	1	2	5
	Optional course (1)	10	2	1	2	5
	Optional course (2)	10	2	1	2	5
Total		**60**	**8**	**4**	**20**	**32**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY4 - Semester (2)						
ECE24H	Research Project [1:1]	10	0	0	6	6
ECE25H	Design Project [1:1]	10	0	0	6	6
ECE28H	Digital Communications (4)	10	2	1	2	5
ECE29H	Embedded Systems	10	2	1	2	5
	Optional course (3)	10	2	1	2	5
	Optional course (4)	10	2	1	2	5
Total		**60**	**8**	**4**	**20**	**32**

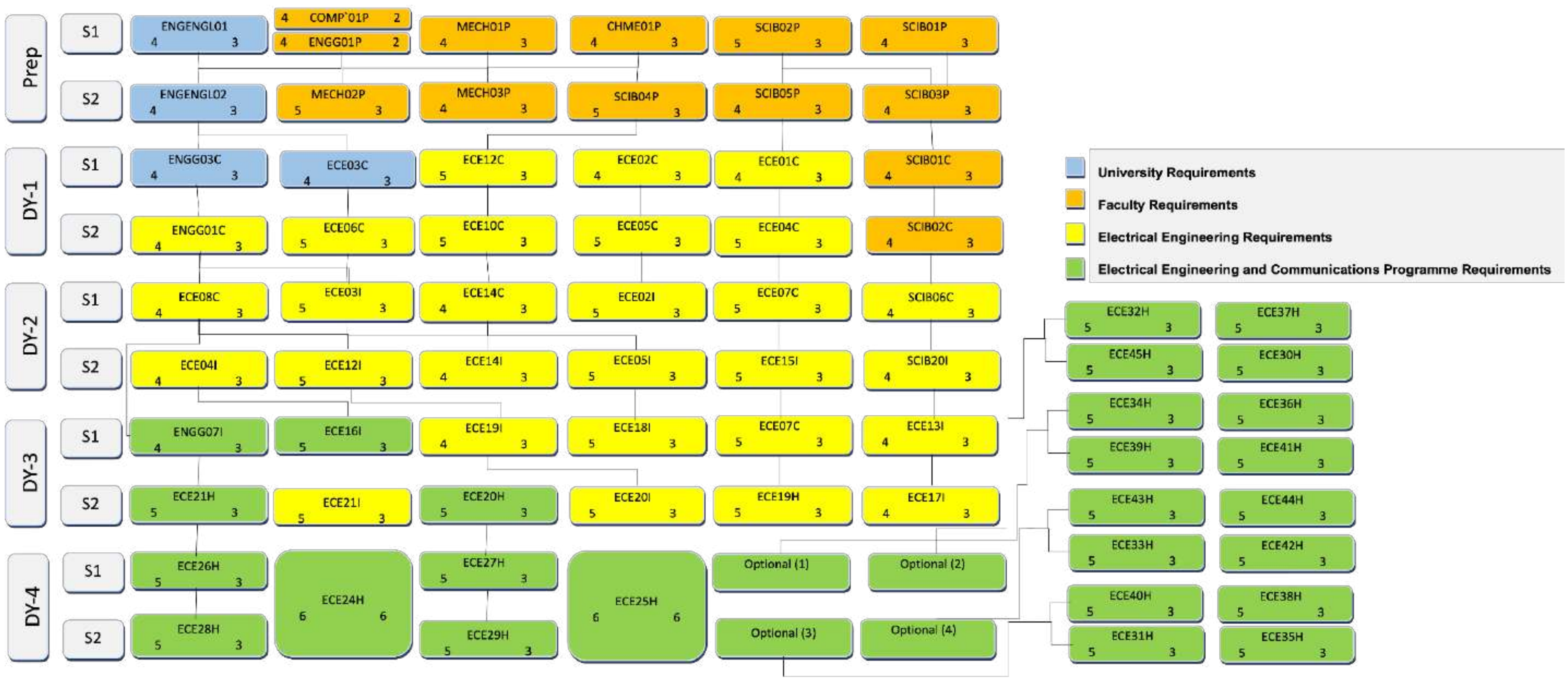
Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
Optional Course (1)						
ECE30H	Network Synthesis	10	2	1	2	5
ECE31H	Fibre Optic Communications	10	2	1	2	5
ECE32H	Energy Harvesting Systems	10	2	1	2	5
ECE33H	Artificial Intelligence	10	2	1	2	5
Total		**40**	**8**	**4**	**8**	**20**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
Optional Course (2)						
ECE34H	Digital Image Processing	10	2	1	2	5
ECE35H	Optoelectronics	10	2	1	2	5
ECE36H	Wireless Communications	10	2	1	2	5
ECE37H	VLSI Technology	10	2	1	2	5
Total		**40**	**8**	**4**	**8**	**20**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
Optional Course (3)						
ECE38H	RF Systems Design	10	2	1	2	5
ECE39H	Mobile Communications	10	2	1	2	5
ECE40H	Antennas and Propagation (2)	10	2	1	2	5
ECE41H	Wireless Sensor Networks	10	2	1	2	5
Total		**40**	**8**	**4**	**8**	**20**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
Optional Course (4)						
ECE42H	Radar System and Tracking	10	2	1	2	5
ECE43H	Software Defined Radio	10	2	1	2	5
ECE44H	Selected Topics in Communications Engineering	10	2	1	2	5
ECE45H	Selected Topics in Electronics Engineering	10	2	1	2	5
Total		**40**	**8**	**4**	**8**	**20**

Programme Courses Tree



9. An Overview of Teaching, Learning and Assessment Strategies to Enable Competencies to be Achieved and Demonstrated

A. Learning and Teaching Methods

Throughout the programme students are encouraged to undertake independent reading both to supplement and consolidate what is being taught and to broaden, develop and reinforce their competencies throughout the programme. Targeted delivery may come from a variety of sources such as

1. Lectures.
2. Tutorials.
3. Problem solving classes.
4. Laboratory sessions
5. Specialized sessions on electronic design automation (EDA) tools.
6. Self-study session.

Further support is gained through study skills delivered as a matter of policy within both the English language programme and individual modules.

B. Assessment

Competencies are tested and assessed throughout the programme using a variety of forms that typically include a combination of

1. Unseen written examinations.
2. Class test.
3. Practical Assessment.
4. Projects.
5. VIVA (Panel).
6. Technical reports.
7. Dissertation.
8. Student's Efforts (Supervisor).
9. Interim Report (Panel
10. Design Brief (Supervisor).
11. Group presentation.

Coursework forms a particularly important part of the assessment. This method of assessment can

(i) be used to strongly motivate independent learning.
(ii) improve student planning and time management skills and
(iii) to develop the comprehension and usage of technical English (particularly important for students at the BUE).

Examinations show how well the student can demonstrate their mastery of an area of scholarly knowledge by selecting appropriate material from memory and applying it to an unseen question in a limited time period. Coursework allows the student to demonstrate wider academic skill of focused scholarly research, drafting, editing and polished writing.

Applied skills are tested and assessed throughout the programme using a combination of coursework assignments, design studies, laboratory logbooks, project reports and/or papers, project logbooks and work placement reports.

10. Support for Learning

- All resources needed for the courses are updated and uploaded on the E-Learning (https://learn1.bue.edu.eg/login/index.php)
- The tutorials are designed by the module leaders (course leader) to ensure a strong link with module contents to provide students with useful, challenging, good support & practice for the material discussed in lectures.
- Students are provided with feedback related to their submissions within two weeks of submissions.
- For assessed work, feedback is provided in the form of individual written feedback on coursework and as a discussion during tutorials.
- For developmental work, feedback is delivered in the form of dialogue between students and staff in tutorials as well as individual feedback provided in tutorials.
- Weaker students are supported with additional remedial classes and clinics during office hours to uplift their performance.
- A generic exam feedback is developed and posted on E-learning after releasing scripts to students each semester. Students will be notified via e-mail once generic feedback is uploaded.
- Institutional services including the Library, Welfare Counsellor, Faculty services including a Student Support Officer and Programme Handbook.

11. Crisis and Disaster Management

The faculty of Engineering manages crisis and disaster through the following:

1. Crisis and Disaster Committee
2. Contingency Plan
3. Health and Safety
4. Contact Trees

12. Entry Requirements

In addition to the requirements listed in Part-B, students are required to successfully complete of the Engineering Preparatory Year and passing the entry exam which evaluates student's abilities and architectural skills.

Other admission routes may be considered in accordance with the University's regulations as defined in the Undergraduate Academic Regulations.

13. Quality Assurance and Programme Enhancement

- In accordance with the University's Quality Assurance procedures, as defined in the Annual Quality Assurance and Enhancement Cycle.
- Feedback on all aspects of this programme will be obtained via standard procedures from the University's framework for quality assurance, as defined in the Annual Quality and Enhancement Cycle.

14. Programme Management

- Head of Department
- Programme Director

The programme management is mainly carried out by the HoD. However, the main task of the PD is to monitor the sound delivery of the programme, and the maintenance of academic standards and quality, in line with the University's Strategic Plan for Teaching and Learning.

In addition to the previous, monthly Departmental meetings are carried out with all department's staff members. Related issues are raised for in-depth analysis and discussion to the FTLC that in turn raises with the UTLC and Senate for final decision.

15. Appendices

1. Mapping matrix of Programme Mission vs. Faculty Mission

			Faculty Mission			
			1. Provide broad spetrum of education with British ethos.	2. Encourages high quality research outcomes.	3. Collaborate with UK and global partners to provide internationally recognized quality degree.	4. Contribute to the community development.
Programme Mission	1	Provide highest quality, up-to-date education based with British ethos corresponding to the QAA standards in the fields of modern electronics and communications technologies.	X			X
	2	Equipe graduates from the electrical and communications engineering programme with adequate long-life learning skills.	X			
	3	Enable graduate from the electrical and communications engineering programme with potential job opportunities on both the national as well as the international job market.			X	
	4	Produce high level research outcomes in the domain the specialization.		X		

2. Mapping matrix of Programme Mission vs. Graduates Attributes

Programme Mission		Graduate Attributes: 1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.	2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.	3. Behave professionally and adhere to engineering ethics and standards.	4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance	5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.	7. Use techniques, skills, and modern engineering tools necessary for engineering practice.	8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.	9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.	10. Demonstrate leadership qualities, business administration and entrepreneurial skills.	11. Develop appropriate research skills in the field of Electrical Engineering and Communications.	12. Master the use of industry-standard specialized relevant Electronic Design Automation (EDA) software tools.
1	Provide highest quality, up-to-date education based with British ethos corresponding to the QAA standards in the fields of modern electronics and communications technologies.	X	X										
2	Equipe graduates from the electrical and communications engineering programme with adequate long-life learning skills.	X						X	X				X
3	Enable graduate from the electrical and communications engineering programme with potential job opportunities on both the national as well as the international job market.			X	X	X	X				X		
4	Produce high level research outcomes in the domain the specialization.									X		X	

3. Mapping matrix of Programme Mission vs. Programme Competencies

Programme Aims (Objectives)		Programme Competencies: General Competencies (A-Level)										Discipline Competencies (B-Level) [Electrical Engineering]					Programme Competencies (C-Level) Communications Engineering			
		Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	Select, model, and analyse electrical power systems applicable t	Design, model and analyse an electrical/electronic/digital system	Design and implement elements, modules, sub-systems, or syst	Estimate and measure the performance of an electrical/electronic	Adopt suitable national and international standards and codes to c	Develop innovative solutions for the practical industrial problems.	Proposing various solutions for communication engineering applications in business/industrial problems. Cost-benefit analysis should be performed especially in sensitive domains where direct and indirect costs are involved.	Practice computer programming for the design and diagnostics of different types of communications systems, coding, and decoding systems	Apply probabilistic methods and statistics to electrical and communication engineering problems
1	Continuously update the *programme* to incorporate recent trends in the field of specialization	X	X									X	X	X	X				X	
2	Establish cooperation protocols with, industrial enterprises, educational and research institutes.			X			X	X								X		X		
3	Develop postgraduate programme in focus areas related to the field of specialization			X							X						X			X
4	Continue the improvement of research outcomes					X												X		X
5	Apply for and acquire external funding either from national or international funding entities					X												X		
6	Provide the job market with a competent graduate who is able to excel in recent technologies in the field of specialization	X	X		X				X	X	X	X	X	X	X	X	X		X	

4. Mapping matrix of Programme Aims (Objectives) vs. Faculty Aims (Objectives).

Programme Aims (Objectives)			Faculty Aims (Objectives)		
			1. Teaching & Learning	2. Research	3. Community Services & Enterprise
	1	Continuously update the p*rogramme* to incorporate recent trends in the	1.1, 1.2, 1.3	2.8, 2.10	3.1, 3.2, 3.4
	2	Establish cooperation protocols with, industrial enterprises, educational and research institutes.	1.10,1.11, 1.13	2.4, 2.7, 2.11	3.1, 3.2, 3.5, 3.8
	3	Develop postgraduate programme in focus areas related to the field of specialization	1.2, 1.3	2.1, 2.2, 2.3, 2.4	3.1, 3.7
	4	Continue the improvement of research outcomes	1.11, 1.13	2.8, 2.9, 2.10, 2.11, 2.12	3.5, 3.7
	5	Apply for and acquire external funding either from national or international funding entities	1.13	2.11, 2.12	3.3, 3.6
	6	Provide the job market with a competent graduate who is able to excel in recent technologies in the field of specialization	1.1, 1.2, 1.4, 1.13	2.1, 2.2, 2.8	3.2, 3.4

5. Mapping matrix of Programme Aims (Objectives) vs. Graduates Attributes

Programme Aims (Objectives)			Graduate Attributes: 1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.	2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.	3. Behave professionally and adhere to engineering ethics and standards.	4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance	5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.	7. Use techniques, skills, and modern engineering tools necessary for engineering practice.	8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.	9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.	10. Demonstrate leadership qualities, business administration and entrepreneurial skills.	11. Develop appropriate research skills in the field of Electrical Engineering and Communications.	12. Master the use of industry-standard specialized relevant Electronic Design Automation (EDA) software tools.
	1	Continuously update the *programme* to incorporate recent trends in the field of specialization	X	X				X				X		
	2	Establish cooperation protocols with, industrial enterprises, educational and research institutes.			X	X								
	3	Develop postgraduate programme in focus areas related to the field of specialization						X	X					
	4	Continue the improvement of research outcomes					X							
	5	Apply for and acquire external funding either from national or international funding entities											X	
	6	Provide the job market with a competent graduate who is able to excel in recent technologies in the field of specialization	X	X		X	X		X	X	X	X	X	X

6. Mapping Matrix of Programme Aims (Objectives) vs Programme Competencies

Programme Aims (Objectives)		Programme Competencies: General Competencies (A-Level)										Discipline Competencies (B-Level) [Electrical Engineering]					Programme Competencies (C-Level) Communications Engineering			
		Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	Select, model, and analyse electrical power systems applicable t	Design, model and analyse an electrical/electronic/digital system	Design and implement elements, modules, sub-systems, or syst	Estimate and measure the performance of an electrical/electronic	Adopt suitable national and international standards and codes to c	Develop innovative solutions for the practical industrial problems.	Proposing various solutions for communication engineering applications in business/industrial problems. Cost-benefit analysis should be performed especially in sensitive domains where direct and indirect costs are involved.	Practice computer programming for the design and diagnostics of different types of communications systems, coding, and decoding systems	Apply probabilistic methods and statistics to electrical and communication engineering problems
1	Continuously update the *programme* to incorporate recent trends in the field of specialization	X	X									X	X	X	X				X	
2	Establish cooperation protocols with, industrial enterprises, educational and research institutes.			X			X	X								X		X		
3	Develop postgraduate programme in focus areas related to the field of specialization			X							X						X			X
4	Continue the improvement of research outcomes					X												X		X
5	Apply for and acquire external funding either from national or international funding entities					X												X		
6	Provide the job market with a competent graduate who is able to excel in recent technologies in the field of specialization	X	X		X				X	X	X	X	X	X	X	X	X		X	

7. Mapping matrix of Programme Competencies vs. Graduate Attributes

			Programme Competencies																		
			General Competencies (A-Level)										Discipline Competencies (B-Level) [Electrical Engineering]					Programme Competencies (C-Level) Communications Engineering			
			Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	Select, model, and analyse electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.	Design, model and analyse an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and Services.	Develop innovative solutions for the practical industrial problems.	Proposing various solutions for communication engineering applications in business/industrial problems. Cost-benefit analysis should be performed especially in sensitive domains where direct and indirect costs are involved.	Practice computer programming for the design and diagnostics of different types of communications systems, coding, and decoding systems	Apply probabilistic methods and statistics to electrical and communication engineering problems
Gradutes Attributes	1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.	X	X									X	X	X	X				X	X
	2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.	X	X	X								X	X	X	X	X				X
	3	Behave professionally and adhere to engineering ethics and standards.							X												
	4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance							X												
	5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;										X					X		X		
	6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles.			X	X													X		
	7	Use techniques, skills, and modern engineering tools necessary for engineering practice.		X														X		X	X
	8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.				X												X			
	9	Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.					X			X	X								X		
	10	Demonstrate leadership qualities, business administration and entrepreneurial skills.						X			X										
	11	Develop appropriate research skills in the field of Electrical Engineering and Communications.					X														
	12	Master the use of industry-standard specialized relevant Electronic Design Automation (EDA) software tools.													X					X	

8. Mapping matrix of Courses vs. Programme Competencies (include Prep Year)

Semester	Modules		Programme Competencies																		
	Title	Code	General Competencies (A-Level)										Discipline Competencies (B-Level) [Electrical Engineering]					Programme Competencies (C-Level) Communications Engineering			
			A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	B.1	B.2	B.3	B.4	B.5	C.1	C.2	C.3	C4
Prep Year Semester 1	Mathematics for Engineers (1)	SCIB01P	X				X				X										
	Introductory Physics	SCIB02P		X				X		X											
	Engineering Mechanics	MECH01P	X	X			X														
	Chemistry for Engineers	CHME01P		X	X				X												
	Introduction to Computing	COMP01P				X						X									
	English for Academic Purposes	ENGENGL01								X	X	X									
	Engineering Ethics and Human Rights	ENGG01P				X			X	X											
Prep Year Semester 2	Mathematics for Engineers (2)	SCIB03P	X				X				X										
	Electricity and Magnetism	SCIB04P		X					X	X											
	Algebra and Geometry	SCIB05P	X		X		X														
	Engineering Drawing and Descriptive Geometry	MECH02P			X	X															
	Production Technology I	MECH03P				X	X	X													
	English and Academic Writing	ENGENGL02					X		X	X	X	X									
DY1 Semester 1	Electric Circuits (1)	ECE01C												X	X						
	Solid State Electronics	ECE02C												X		X					
	Report Writing and Data Presentation	ECE03C				X			X	X		X									
	Calculus	SCIB01C	X	X			X														
	Computer Programming	ECE12C				X		X				X									
	Entrepreneurship: Theory and Practice	ENGG03C													X		X				
DY1 Semester 2	Electric Circuits (2)	ECE04C												X	X						
	Electronics (1)	ECE05C												X	X						
	Digital Design	ECE10C												X	X						
	Differential Equations	SCIB02C	X	X			X														
	Signals and Systems	ECE06C														X	X				
	Engineering Project Management	ENGG01C			X	X	X		X	X	X										
DY2 Semester 1	Electronics (2)	ECE02I												X	X						
	Electromagnetic Fields (1)	ECE08C											X			X					
	Probability and Statistics	SCIB06C														X	X				
	Maths for Communications	ECE03I														X	X				
	Electrical Power	ECE07C											X			X					
	Computer Organization	ECE14C												X		X					
DY2 Semester 2	Electronic Measurement and Instrumentation	ECE05I														X	X				
	Computer Architecture	ECE14I												X	X						
	Analog Communications	ECE12I														X	X				
	Electromagnetic Fields (2)	ECE13I												X			X				
	E&C: Law, Standards and Practice	ECE04I														X	X				
	Applied Numerical Techniques	SCIB20I														X	X				
Summer Training (1)	Industrial Training Placement (1)	ENGG03I											X	X	X	X	X	X	X	X	
DY3 Semester 1	Digital Communications (1)	ECE16I													X		X				
	Electromagnetic Waves	ECE17I													X		X				
	Engineering Economics	ENGG07I													X		X				
	Control Systems	ECE15I											X			X					
	Electronics (3)	ECE18I												X	X						
	Computer Networks	ECE19I																	X	X	
DY3 Semester 2	Digital Control	ECE19H																X			X
	Digital Communications (2)	ECE20H																	X	X	
	Microwave Engineering	ECE21H																	X		X
	Digital Signal Processing	ECE22H																X	X		
	Optical Systems	ECE20I																X			X
	Digital Electronics	ECE21I												X	X						
Summer Training (2)	Industrial Training Placement (2)	ENGG07H											X	X	X	X	X	X	X	X	
DY4 Semester 1 & 2	Research Project [1:1]	ECE24H																X	X	X	X
	Design Project [1:1]	ECE25H																X	X	X	X
DY4 Semester 1	Digital Communications (3)	ECE26H																	X	X	
	Antennas and Propagation (1)	ECE27H																	X		X
	Optional Course (1)																				
	Optional Course (2)																				
DY4 Semester 2	Digital Communications (4)	ECE28H																	X	X	
	Embedded Systems	ECE29H																X		X	
	Optional Course (3)																				
	Optional Course (4)																				
Optional Courses (1)	Network Synthesis	ECE30H																	X	X	
	Fibre Optic Communications	ECE31H																	X	X	
	Energy Harvesting Systems	ECE32H																X			X
	Artificial Intelligence	ECE33H																X		X	
Optional Courses (2)	Digital Image Processing	ECE34H																X			X
	Optoelectronics	ECE35H																X			X
	Wireless Communications	ECE36H																	X	X	
	VLSI Technology	ECE37H																X		X	
Optional Courses (3)	RF Systems Design	ECE38H																	X		X
	Mobile Communications	ECE39H																	X	X	
	Antennas and Propagation (2)	ECE40H																	X		X
	Wireless Sensor Networks	ECE41H																X		X	
Optional Courses (4)	Radar System and Tracking	ECE42H																	X		X
	Software Defined Radio	ECE43H																	X	X	
	Selected Topics in Communications Engineering	ECE44H																X	X	X	X
	Selected Topics in Electronics Engineering	ECE45H																X	X	X	X

9. Teaching and Learning methods vs. Programme Competencies

		Programme Competencies																		
		General Competencies (A-Level)										Discipline Competencies (B-Level) [Electrical Engineering]					Programme Competencies (C-Level) Communications Engineering			
		Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	Select, model, and analyse electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.	Design, model and analyse an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and Services.	Develop innovative solutions for the practical industrial problems.	Proposing various solutions for communication engineering applications in business/industrial problems. Cost-benefit analysis should be performed especially in sensitive domains where direct and indirect costs are involved.	Practice computer programming for the design and diagnostics of different types of communications systems, coding, and decoding systems	Apply probabilistic methods and statistics to electrical and communication engineering problems
1	Lectures	X									X	X	X	X	X	X				
2	Tutorials	X							X	X	X	X	X	X	X	X				
3	Problem solving sessions	X							X	X	X	X	X	X	X	X				
4	Laboratory sesssions		X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X
5	Specialized sessions on electronic design automation (EDA) tools		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Self-study session		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

10. Assessment methods vs Programme Competencies.

	Assessment Methods	Programme Competencies: General Competencies (A-Level)										Discipline Competencies (B-Level) [Electrical Engineering]					Programme Competencies (C-Level) Communications Engineering			
		Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	Select, model, and analyse electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.	Design, model and analyse an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and Services.	Develop innovative solutions for the practical industrial problems.	Proposing various solutions for communication engineering applications in business/industrial problems. Cost-benefit analysis should be performed especially in sensitive domains where direct and indirect costs are involved.	Practice computer programming for the design and diagnostics of different types of communications systems, coding, and decoding systems	Apply probabilistic methods and statistics to electrical and communication engineering problems
1	Unseen written examination	X		X								X	X	X			X	X		
2	Class test	X		X								X	X	X			X	X		X
3	Practical Assessment		X	X							X	X	X	X	X	X			X	X
4	Projects		X							X	X	X	X	X	X	X			X	X
5	VIVA (Panel)		X		X	X		X	X										X	X
6	Technical reports			X	X	X		X	X						X	X				
7	Dissertation			X	X	X		X	X	X	X						X	X	X	X
8	Student's Efforts (Supervisor)			X	X	X		X	X		X						X	X	X	X
9	Interim Report (Panel)					X	X	X	X		X						X	X	X	X
10	Design Brief (Supervisor)						X	X	X	X	X						X	X	X	X
11	Group presentation				X		X	X	X	X	X						X	X	X	X

11. Mapping matrix of Programme competencies vs. Learning outcomes – Accreditation of Higher Education Programmes (AHEP), fourth edition, August 2020

Programme Competencies		Learning outcomes – Accreditation of Higher Education Programmes (AHEP), fourth edition, August 2020
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and	**B1.** Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	**B2.** Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles
		B3. Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	**B5.** Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**B4.** Select and evaluate technical literature and other sources of information to address broadly-defined problems
		B7. Evaluate the environmental and societal impact of solutions to broadly-defined problems
		B8. Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct
		B9. Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity
A5	Practice research techniques and methods of investigation as an inherent part of learning.	**B6.** Apply an integrated or systems approach to the solution of broadly-defined problems
A6	Plan, supervise and monitor implementation of engineering projects.	**B16.** Function effectively as an individual, and as a member or leader of a team
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**B16.** Function effectively as an individual, and as a member or leader of a team
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**B17.** Communicate effectively with technical and non-technical audiences
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**B15.** Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	**B15.** Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters
B1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.	**B12.** Use practical laboratory and workshop skills to investigate broadly-defined problems
B2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	**B13.** Select and apply appropriate materials, equipment, engineering technologies and processes
B3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.	**B13.** Select and apply appropriate materials, equipment, engineering technologies and processes
		B15. Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters
B4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.	**B12.** Use practical laboratory and workshop skills to investigate broadly-defined problems
B5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and Services	**B8.** Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct
		B9. Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity
		B10. Adopt a holistic and proportionate approach to the mitigation of security risks
		B11. Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion
C1	Develop innovative solutions for the practical industrial problems.	**B13.** Select and apply appropriate materials, equipment, engineering technologies and processes
		B14. Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems
		B15. Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters
C2	Proposing various solutions for communication engineering applications in business/industrial problems. Cost-benefit analysis should be performed especially in sensitive domains where direct and indirect costs are involved.	**B13.** Select and apply appropriate materials, equipment, engineering technologies and processes
		B14. Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems
C3	Practice computer programming for the design and diagnostics of different types of communications systems, coding, and decoding systems	**B3.** Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed
		B13. Select and apply appropriate materials, equipment, engineering technologies and processes
C4	Apply probabilistic methods and statistics to electrical and communication engineering problems	**B3.** Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed

12. Mapping matrix of Programme competencies vs. Competence and Commitment (UK-SPEC), fourth edition, August 2020

Programme Competencies		The UK Standard for Professional Engineering Competence and Commitment (UK-SPEC), fourth edition, August 2020
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. the practical applications of these underlying principles to architectural engineering and construction	A1. Have maintained and extended a sound theoretical approach to the application of technology in engineering practice A2. Use a sound evidence- based approach to problem- solving and contribute to continuous improvement.
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate	B2. Contribute to the design and development of engineering solutions B3. Implement design solutions for equipment or processes and contribute to their evaluation.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks B3. Implement design solutions for equipment or processes and contribute to their evaluation.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	E1.Understand and comply with relevant codes of conduct E2, Understand the safety implications of their role and manage, apply and improve safe systems of work E3. Understand the principles of sustainable development and apply them in their work
A5	Practice research techniques and methods of investigation as an inherent part of learning.	A2. Use a sound evidence- based approach to problem- solving and contribute to continuous improvement.
A6	Plan, supervise and monitor implementation of engineering projects.	C1. Plan the work and resources needed to enable effective implementation of engineering tasks and projects
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	C3. Manage teams, or the input of others, into own work and assist others to meet changing technical and management needs
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	D1. Communicate effectively with others, at all levels, in English
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	E4. Carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	E4. Carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice
B1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.	A2. Use a sound evidence- based approach to problem- solving and contribute to continuous improvement.
B2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	B2. Contribute to the design and development of engineering solutions
B3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using	B3. Implement design solutions for equipment or processes and contribute to their evaluation.
B4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks
B5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and Services	E1.Understand and comply with relevant codes of conduct E2, Understand the safety implications of their role and manage, apply and improve safe systems of work E3. Understand the principles of sustainable development and apply them in their work E4. Carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice E5. Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner.
C1	Develop innovative solutions for the practical industrial problems.	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks B2. Contribute to the design and development of engineering solutions
C2	Proposing various solutions for communication engineering applications in business/industrial problems. Cost-benefit analysis should be performed especially in sensitive domains where direct and indirect costs are involved.	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks B2. Contribute to the design and development of engineering solutions
C3	Practice computer programming for the design and diagnostics of different types of communications systems, coding, and decoding systems	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks B3. Implement design solutions for equipment or processes and contribute to their evaluation.
C4	Apply probabilistic methods and statistics to electrical and communication engineering problems	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks

مواصفات برنامج هندسة الحاسب

Specifications of the Computer Engineering Programme:

Career Prospects

The computer engineering program graduates have started to grab the attention of tier one companies, either nationally or internationally. The program's graduates have constituted a profound reputation in the market, not only because of their technical skills and solid foundation but also because they can communicate effectively in the different communities. The computer engineering program graduates integrate seamlessly within teams, have efficient reporting skills, tasks planning and goals setting to meet objectives. Computer engineering graduates have been with the ability to develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgment to draw conclusions.

The computer engineering program continually strives to prepare graduates to:

- Create computing systems, components, through skillful, and innovative methodologies, meanwhile adhering to the highest ethical standards.
- Make efficient use of analytical reasoning and state-of-the-art approaches based on the engineering sciences and practices.
- Engage with their communities, profession, and the world.
- Pursue professional careers with the ability to adapt to technological change.
- Acquire technical and managerial leadership positions in their chosen careers.

This specification provides the main features of the programme competencies that a typical student might reasonably be expected to achieve and demonstrate if full advantage is taken of the learning opportunities that are provided.

1. Basic Information

1	**Programme title**	**Computer Engineering**
2	**Name of the final award**	**BSc with honours [validated by UK partner]**
3	**Awarding body/institution**	**The British University in Egypt**
4	**Faculty**	**Engineering**
5	**Department**	**Electrical**
6	**Dean**	**Prof. Maguid Hassan**
7	**Head of Department (HoD)**	**Prof. Hani Ghali**
8	**Programme Director (PD)**	**Dr. Sameh Osama**
9	**Professional, Statutory and Regulatory Body Accreditation**	**Egyptian Engineering Syndicate**
10	**Date of initial internal review and updates**	**March 2017**
11	**Approval Date to adopt NARS 2018 by:** **Departmental Council** **Faculty Council**	- **21st September 2020** - **10th October 2020**

2. Programme Mission

The mission of Computer Engineering Programme includes the followings:

- Provide highest quality, up-to-date education based with British ethos corresponding to the QAA standards in the fields of modern computer engineering technologies.
- Equipe graduates from the computer engineering programme with adequate long-life learning skills.
- Enable graduate from the computer engineering programme with potential job opportunities on both the national as well as the international job market.
- Produce high level research outcomes in the domain the specialization.

3. Programme Aims (Objectives)

The aims of this programme are to:

- Continuously update the programme to incorporate recent trends in the field of specialization.
- Establish cooperation protocols with, industrial enterprises, educational and research institutes.
- Develop postgraduate programme in focus areas related to the field of specialization.
- Continue the improvement of research outcomes.
- Apply for and acquire external funding either from national or international funding entities.
- Provide the job market with a competent graduate who is able to excel in recent technologies in the field of specialization.

4. Distinctive Features of the Programme

The BUE delivers programmes based on a British philosophy of education. This results in programme that is very much focused on the students rather than those who deliver the material. Graduates from UK programmes typically exhibit:

- the ability to think creatively and with strong problem-solving skills.
- high level key and transferable skill sets.
- the ability to maintain independently a high level of professional and subject specific competence (often through CPD).
- technical competence.
- the ability to consider problems at a high level (i.e., to see the big picture);
- diligence and ethical working practices.
- the ability to work both independently and as part of a team.
- flexibility and the ability to apply their subject-specific knowledge to fields outside their own.

The BUE Mission is to be the leading provider of high-quality UK style education in the MENA region. The University is committed to ensuring UK validation of its programmes and to ensure a student experience that is in line with UK standards. Built on top of institutional quality assurance is subject level validation and the faculty is committed to ensuring that its UK validating partners confirm that its degree programme is in line with UK standards. An outcome of this will be the dual award of both an Egyptian BSc and a BSc from a UK validating partner in Computer Engineering.

Furthermore, we will be seeking accreditation of this degree programme with the IET "*The Institution of Engineering and Technology*", the UK's leading professional body for this programme discipline. Accredited degree programmes are the preferred and fast track routes for those who aim to obtain the professional qualification of membership in the Institution of Engineering and Technology (IET).

At the time of writing, and to the best of our knowledge, this combination of academic and professional accreditation makes our programme in Computer Engineering quite unique in both Egypt and the surrounding region.

5. Relevant Subject Benchmark Statements and other External and Internal Reference Points Used to achieve Programme Outcomes

To ensure that the programme complies with the requirements of relevant national and international professional institutions/bodies, and to qualify graduates to apply for memberships in respective institutions and/or gain Chartered Engineer status, the following are used as reference points to inform the programme outcomes:

- National Academic Reference Standards (NARS 2018) developed by The National Authority of Quality Assurance and Accreditation of Education (NAQAAE), https://admin.naqaae.eg/api/v1/archive/download/34733
- The UK Standard for Professional Engineering Competence and Commitment (UK-SPEC), The revised fourth edition of UK-SPEC was published on 31 August 2020 and implemented by 31 December 2021, https://www.engc.org.uk/standards-guidance/standards/uk-spec/fourth-edition-implemented-from-31-december-2021/
- Engineering Council, The Accreditation of Higher Education Programmes (AHEP), Fourth Edition, https://www.engc.org.uk/media/3464/ahep-fourth-edition.pdf
- The IET-AHEP Publications; "Guidance on how to meet the Learning Outcome requirements for Accreditation" and "Accreditation of HE Programmes (AHEP): Collated learning outcomes for six areas of learning" available at; http://www.theiet.org/academics/accreditation/policy-guidance/
- Subject Benchmark Statement: Engineering, https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/subject-benchmark-statement-engineering.pdf?sfvrsn=1f2c881_16

- The Computer Engineering Programme originally adopted NARS 2009 and upon the issuing of national Academic Reference Standards (NARS 2018 for Engineering 2nd edition), the programme performed a gap analysis with additional action plan to bridge all gaps if any. Hence, the programme specifications are updated to comply with National Academic Reference Standards (NARS 2018) developed by The National Authority of Quality Assurance and Accreditation of Education (NAQAAE).), https://admin.naqaae.eg/api/v1/archive/download/34733

6. Graduate Attributes

The creative way of approaching all engineering challenges is being seen increasingly as a 'way of thinking' which is generic across all disciplines. The Computer Engineering Programme adopted the NARS 2018 attributes for Engineering. The graduates of Computer Engineering Programme should have the ability to:

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.
2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.
3. Behave professionally and adhere to engineering ethics and standards.
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.
7. Use techniques, skills, and modern engineering tools necessary for engineering practice.
8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.
9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.
11. Develop appropriate research skills in the field of Computer Engineering.
12. Master the use of industry-standard specialized relevant Electronic Design Automation (EDA) software tools.

University Requirements

The university is considered a core of Human Thinking at its highest level, and the source of investment and development of human resources. It is concerned with the rise of the Arabian Civilization and the Historical Heritage of the Egyptian Society, and its traditions. It is also concerned with the education of Religion, Morals and Nationalism (Egyptian National Law for Universities, Law 49 for Year 1972). Therefore, BUE graduates should be able to or aware of:

- National, regional, and international contemporary issues, to have an intellectual and enlightened personality and to interact effectively in the community through different communication skills.
- To achieve this goal, BUE has designed several courses planned to build the student personality, develop his/her skills, and increase his/her awareness of different topics. These courses are listed in Table 6.

Faculty Requirements

The Computer Engineering Programme offered at the Faculty of Engineering, the British University in Egypt, is an Engineering Programme. The graduates have the privilege of being Engineers and are automatically enrolled in the Egyptian Engineering Syndicate (EES).

Competencies for Engineering Graduates

According to the **National Academic Reference Standards (NARS-2018),** the **Engineering Graduate must be able to (A-Level):**

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
A2. Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.
A5. Practice research techniques and methods of investigation as an inherent part of learning.
A6. Plan, supervise and monitor implementation of engineering projects.
A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
A9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

- Modules (courses) required to achieve these competencies (A-level) are listed in Table

Discipline Requirements (Electrical Engineering Requirements)

According to the National Academic Reference Standards (NARS-2018), Computer Engineering Programme graduates must meet specific competencies. Thus, in addition to the Competencies of all Engineering Programmes (A-Level), the Computer Engineering Programme graduate must be able to (B-Level):

B1. Select, model, and analyse electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.
B2. Design, model and analyse an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
B3. Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.
B4. Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.
B5. Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and Services.

- Courses required to achieve these competencies (B-level) are listed in Table 8.

Programme Competencies for UK Requirements:

The Computer Engineering Programme adopted the National Reference Standards (NARS) issued in 2018 at the level of competencies (A & B) considering A as general competencies for all engineers and B as specialized competencies for electrical engineers. Given the requirements of the British partner, the Programme also adopted (ARS) at the level of (C) to meet the requirements of (UK-SPEC), fourth edition, and AHEP, fourth edition:

C1. Proposing various computer-based solutions to business system problems. Cost-benefit analysis that should be performed especially in sensitive domains where direct and indirect costs are involved.
C2. Innovating solutions based on non-traditional thinking and the use of latest technologies.
C3. Use appropriate specialised computer software, computational tools, and design packages throughout the phases of the life cycle of system development.
C4. Write computer programs on professional levels achieving acceptable quality measures in software.

- Courses required to achieve these competencies (C-level) are listed in Table 9.

7. Programme Structure, Levels, Modules, Credits and Awards.

Credit Point System

- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) to be awarded a UK validated degree. This is in addition to the specialist courses (modules) and other requirements of the Egyptian Supreme Council of Universities required for the Egyptian degree.
- The programme is divided into teaching units called modules (courses), which are each assigned a credit weighting.
- Each course is assigned a Level, number of credits and weighting, this reflects the depth of learning required in the relevant programme year.
- A basic 10-credit course requires approximately 100 hours of student effort, which can include 36 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study, and assessment.
- Students study courses with a combined weight of 120 credit points in each year (60 credit points per semester)
- Courses that are delivered in one semester have their assessment completed within the semester in which they are taught. The programme is structured such that formal examinations can take place at the end of each semester.

Academic Semesters

- The academic year is divided into two semesters: Semester 1 and Semester 2.
- Each semester is 15-weeks in length.
- Week 13 being a revision week, and weeks 14- 15 being assessment weeks at the end of each semester.
- The Academic year includes a summer assessment period where students can resit-failed courses.

Article (10): Programme Levels

- The whole programme, of total 600 credit points, is divided into four levels P, C, I and H (120 for P and 160 for each of C, I and H), according to the Framework for Higher Education Qualifications of UK Degree-Awarding Bodies.
- These levels reflect the depth of learning required in the relevant programme year.
- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) of the UK Degree-Awarding Bodies to be awarded a UK validated degree, in addition to the Egyptian degree.
- Each programme is also divided into **four levels of competencies, as per the NARS 2018**, as follows:

  o Level (0) University requirements
  - Level (A) Faculty requirements
  - Level (B) Discipline requirements
  - Level (C) Programme requirements

Article (11): Duration of Study

- The duration of Study is five years (10 semesters) including a Preparatory Year.

Article (13): Programme Structure

- All taught undergraduate programmes at BUE are modular in structure.
- The Computer Engineering Programme is assigned as a credit weighting. A basic 10-credit course requires approximately 100 hours of student effort, which can include 35 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study, and assessment. The maximum credit weighting for any one course is normally 20 credits.
- Courses that are delivered over two semesters have 20-50% of their assessment completed in semester one and the remainder in semester two,

8. Conformity of the Computer Engineering Programme to Supreme Council of Universities (SCU) Guidelines

The SCU guidelines consists of seven major categories that run throughout the whole programme; namely: Human and Social Sciences; Mathematics and Basic Science, Basic Engineering Science, Applied Engineering Sciences, Computer Applications and ICT, Projects and Practice and Discretionary (Institution character- identifying) Subject with range of weights of [9-12%], [20-26%], [20-23%], [20-22%], [9-11%], [8-11%], and [6-8%] respectively. The credits contribution, of the major categories in the Computer Engineering Programme is presented as follows:

Table 4 Indicative Curricula Content by Subject Area

Total no. of hrs / programme = Computer Engineering											
Curricula Content by Subject Area		Number of Courses	No of Course / levels					Total no. of hrs / subject area	% of subject area	Total % of NARS
			Prep year	DY1 (hrs)	DY2 (hrs)	DY3 (hrs)	DY4 (hrs)			
A	Humanities and social Science	7	25	20	10	10	0	65	10.8%	9-12
B	Mathematics and Basic Science	12	70	20	20	10	0	120	20.0%	20-26
C	Basic Engineering Science	12	20	50	60	10	0	140	23.0%	20-23
D	Applied Engineering and Design	13	0	20	20	60	30	130	21.6%	20-22
E	Computer Applications and ICT	6	5	10	10	30	0	55	9.1%	9-11
F	Projects and Practice	4	0	0	0	0	50	50	8.3%	8-11
G	Discretionary (Institution character-identifying) Subject	3	0	0	0	0	40	40	6.0%	6-8

Total no. of hrs / programme = Computer Engineering										
Curricula Content by Subject Area		Number of Courses	No of Course / levels					Total no. of hrs / subject area	% of subject area	Total % of NARS
			Prep year	DY1 (hrs)	DY2 (hrs)	DY3 (hrs)	DY4 (hrs)			
	Total No. of hrs /DY	57	120	120	120	120	120	600	100.0%	

Table 5 Major Categories of the Computer Engineering Programme

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
University Requirements										
Prep	ENGENGL01	English for Academic Purposes	10	X						
Prep	ENGENGL02	English & Academic Writing	10	X						
DY1	COMP02C	Programming and Software Design	10					X		
DY1	COMP01C	Report Writing and Data Presentation	10	X						
DY1	ENGG01C	Engineering Project Management	10	X						
Level A: Faculty Requirements										
Prep	SCIB01P	Mathematics for Engineers (1)	10		X					
Prep	SCIB02P	Introductory Physics	10		X					
Prep	MECH01P	Engineering Mechanics	10		X					
Prep	CHME01P	Chemistry for Engineers	10		X					
Prep	COMP01P	Introduction to Computing	5					X		
Prep	ENGG01P	Engineering Ethics and Human Rights	5	X						
Prep	SCIB03P	Mathematics for Engineers (2)	10		X					
Prep	SCIB04P	Electricity and Magnetism	10		X					
Prep	SCIB05P	Algebra and Geometry	10		X					
Prep	MECH02P	Engineering Drawing and Descriptive Geometry	10			X				
Prep	MECH03P	Production Technology I	10			X				
DY1	SCIB01C	Calculus	10		X					
DY1	SCIB02C	Differential Equations	10		X					

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
Level B: Discipline (Electrical Engineering) Requirements										
DY1	ELEC01C	Electric Circuits [1:1]	20			X				
DY1	ELEC02C	Electronics [1:1]	20			X				
DY1	COMP03C	Computer Organization	10				X			
DY1	COMP04C	Introduction to Data Structure and Algorithms Design	10				X			
DY1	ELEC11C	Electronic Measurements	10			X				
DY2	SCIB05I	Discrete Mathematics	10		X					
DY2	ELEC11I	Electrical Energy Systems	10			X				
DY2	ELEC14C	Signals & Systems	10			X				
DY2	COMP02I	Operating Systems	10			X				
DY2	COMP06C	Communications Skills	10	X						
DY2	COMP05C	Digital Design	10			X				
DY2	COMP03I	Software Engineering (1)	10				X			
DY2	COMP04I	Control System Design	10			X				
DY2	COMP05I	Computer Architecture	10					X		
DY2	ENGG02C	Engineering Economics	10	X						
DY2	COMP06I	Database Systems	10			X				
DY2	ELEC17I	Digital Electronics	10				X			
DY3	SCIB07I	Probability and Statistics	10		X					
DY3	ELEC09I	Introduction to Communications Systems	10			X				
DY3	ELEC01H	Digital Signal Processing	10				X			
DY3	COMP12I	Data Communications and Computer Networks	10					X		
DY3	COMP13I	Computer Controlled Systems	10					X		
DY3	COMP09I	Operations Research	10		X					

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
Level C: Programme (Computer Engineering) Requirements										
DY3	COMP07I	Internet Programming	10					X		
DY3	COMP11I	Computer Graphics	10				X			
DY3	COMP02H	Modelling and Simulation Techniques	10				X			
DY3	COMP03H	Microprocessor Design	10				X			
DY3	COMP04H	Digital Control Systems	10				X			
DY3	COMP14I	Analysis and Design of Algorithms	10				X			
DY4	COMP08H	Research Project [1:1]	20							X
DY4	COMP09H	Design Project [1:1]	20						X	
DY4	COMP10H	Mobile Computing	10				X			
DY4	COMP10H	Distributed Systems	10				X			
DY4	COMP11H	Human-Computer Interaction	10				X			
DY4	COMP12H	Computer Vision	10						X	
DY4	COMP13H	Compiler Design	10						X	
DY4	COMP14H	Embedded Systems	10						X	
DY4		Optional course (1)	10							X
DY4		Optional course (12)	10							X
Optional Courses										
DY4	COMP16H	Digital Image Processing	10							
DY4	COMP17H	Artificial Neural Networks	10							
DY4	COMP18H	Design of Web-Based Systems	10							
DY4	COMP19H	Wireless Sensor Networks	10							
DY4	COMP20H	Software Engineering (2)	10							
DY4	COMP21H	Multimedia Systems	10							
DY4	COMP22H	Systems Security	10							
DY4	COMP23H	Selected Topics in Computer Engineering	10							
		Total	**600**	**65**	**120**	**140**	**130**	**55**	**50**	**40**
		%	**100**	**10.8**	**20**	**23**	**21.6**	**9.1**	**8.3**	**6.0**

Programme Courses

Courses required to achieve the University Requirements

Table 6 List of University requirements courses.

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
ENGENGL01	English for Academic Purposes	10	2	2	0	4
ENGENGL02	English & Academic Writing	10	2	2	0	4
COMP02C	Programming and Software Design	10	2	0	3	5
COMP01C	Report Writing and Data Presentation	10	2	2	0	4
ENGG01C	Engineering Project Management	10	2	2	0	4
Total University Requirements		**50**	**10**	**8**	**3**	**21**

Courses Required to achieve the General Competencies of A-level (Faculty Requirements)

A set of courses must be completed as a Faculty Requirement. These courses are divided into Basic Science Courses and Basic Engineering Courses.

Table 7 List of Faculty requirements courses.

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
MECH01P	Engineering Mechanics *	10	2	2	0	4
CHME01P	Chemistry for Engineers *	10	2	1	2	5
COMP01P	Introduction to Computing *	5	1	0	1	2
ENGG01P	Engineering Ethics and Human Rights *	5	2	0	0	2
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry *	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry *	10	2	3	0	5
MECH03P	Production Technology I *	10	2	2	0	4
SCIB01C	Calculus	10	2	2	0	4
SCIB02C	Differential Equations	10	2	2	0	4
Total Faculty of Engineering Requirements		**120**	**25**	**20**	**7**	**52**

*** Modules that are taught to half the cohort in semester one and the other half in semester two.**

Courses Required to achieve Electrical Engineering Requirements of B-level (Discipline Requirements):

A set of courses must be completed as a Basic Electrical Engineering Requirement, in the Computer Engineering Programme.

Table 8 List of Discipline requirements courses (Electrical Engineering).

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
ELEC01C	Electric Circuits	20	2	1	2	5
ELEC02C	Electronics	20	2	1	2	5
COMP03C	Computer Organization	10	2	1	2	5
COMP04C	Introduction to Data Structure and Algorithms Design	10	2	1	2	5
ELEC11C	Electronic Measurements	10	2	1	2	5
SCIB05I	Discrete Mathematics	10	2	2	0	4
ELEC11I	Electrical Energy Systems	10	2	1	2	5
ELEC14C	Signals & Systems	10	2	1	2	5
COMP02I	Operating Systems	10	2	1	3	6
COMP06C	Communications Skills	10	2	2	0	4
COMP05C	Digital Design	10	2	1	2	5
COMP03I	Software Engineering (1)	10	2	1	3	6
COMP04I	Control System Design	10	2	1	2	5
COMP05I	Computer Architecture	10	2	1	2	5
ENGG02C	Engineering Economics	10	2	2	0	4
COMP06I	Database Systems	10	2	1	3	5
ELEC17I	Digital Electronics	10	2	1	3	6
SCIB07I	Probability and Statistics	10	2	2	0	4
ELEC09I	Introduction to Communications Systems	10	2	1	2	5
ELEC01H	Digital Signal Processing	10	2	1	2	5
COMP12I	Data Communications and Computer Networks	10	2	1	2	5
COMP13I	Computer Controlled Systems	10	2	1	2	5
COMP09I	Operations Research	10	2	2	0	4
Total Discipline: Electrical Engineering Requirements		**250**	**46**	**29**	**38**	**113**

Courses Required to achieve the Computer Engineering Competencies of C-level (Programme Competencies for UK Requirements):

Courses Required to get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed:

Table 9 List of Programme requirements courses (Computer Engineering).

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
	University Requirements	**50**	**10**	**8**	**3**	**21**
	Faculty of Engineering Requirements	**120**	**25**	**20**	**7**	**52**
	Discipline: Electrical Engineering Requirements	**250**	**46**	**29**	**38**	**113**
University + Faculty + Discipline Requirements Total		**420**	**81**	**57**	**48**	**186**
	Programme Requirements					
COMP07I	Internet Programming	10	2	1	2	5
COMP11I	Computer Graphics	10	2	1	2	5
COMP02H	Modelling and Simulation Techniques	10	2	1	2	5
COMP03H	Microprocessor Design	10	2	1	2	5
COMP04H	Digital Control Systems	10	2	1	2	5
COMP14I	Analysis and Design of Algorithms	10	2	1	2	5
COMP08H	Research Project [1:1]	20	0	0	6	6
COMP09H	Design Project [1:1]	20	0	0	6	6
COMP10H	Mobile Computing	10	2	1	2	5
COMP10H	Distributed Systems	10	2	1	2	5
COMP11H	Human-Computer Interaction	10	2	1	2	5
COMP12H	Computer Vision	10	2	1	2	5
COMP13H	Compiler Design	10	2	1	2	5
COMP14H	Embedded Systems	10	2	1	2	5
	Optional course (1)	10	2	1	2	5
	Optional course (2)	10	2	1	2	5
Programme Requirements		**180**	**26**	**13**	**38**	**77**
Computer Engineering Programme Requirements Total		**600**	**107**	**70**	**86**	**263**

Proposed Study Plan

To get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed.

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
Preparatory Year - Semester (1)						
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
MECH01P	Engineering Mechanics *	10	2	2	0	4
CHME01P	Chemistry for Engineers *	10	2	1	2	5
COMP01P	Introduction to Computing *	5	2	0	2	4
ENGENGL01	English and Academic Purposes	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights *	5	2	0	0	2
Total		**60**	**12**	**10**	**6**	**28**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
Preparatory Year - Semester (2)						
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry *	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry *	10	2	3	0	5
MECH03P	Production Technology I *	10	2	2	0	4
ENGENGL02	English and academic writing	10	0	4	0	4
Total		**60**	**10**	**14**	**2**	**26**

*** Modules that are taught to half the cohort in semester one and the other half in semester two.**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY1 - Semester (1)						
ELEC01C	Electric Circuits [1:1]	10	2	1	2	5
ELEC02C	Electronics [1:1]	10	2	1	2	5
COMP01C	Report Writing and Data Presentation	10	2	2	0	4
SCIB01C	Calculus	10	2	2	0	4
COMP02C	Programming and Software Design	10	2	1	2	5
COMP03C	Computer Organization	10	2	1	2	5
Total		**60**	**12**	**8**	**8**	**28**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY1 - Semester (2)						
ELEC01C	Electric Circuits [1:1]	10	2	1	2	5
ELEC02C	Electronics [1:1]	10	2	1	2	5
COMP04C	Introduction to Data Structure and Algorithms Design	10	2	1	2	5
SCIB02C	Differential Equations	10	2	2	0	4
ENGG01C	Engineering Project Management	10	2	2	0	4
ELEC11C	Electronic Measurements	10	2	1	2	5
Total		**60**	**12**	**8**	**8**	**28**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY2 - Semester (1)						
SCIB05I	Discrete Mathematics	10	2	2	0	4
ELEC11I	Electrical Energy Systems	10	2	1	2	5
ELEC14C	Signals & Systems	10	2	1	2	5
COMP02I	Operating Systems	10	2	1	3	6
COMP06C	Communications Skills	10	2	2	0	4
COMP05C	Digital Design	10	2	1	2	5
Total		**60**	**12**	**8**	**9**	**29**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY2 - Semester (2)						
COMP03I	Software Engineering (1)	10	2	1	3	6
COMP04I	Control System Design	10	2	1	2	5
COMP05I	Computer Architecture	10	2	1	2	5
ENGG02C	Engineering Economics	10	2	2	0	4
COMP06I	Database Systems	10	2	1	2	5
ELEC17I	Digital Electronics	10	2	1	3	6
Total		**60**	**12**	**7**	**12**	**31**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY2 - Summer Semester						
ENGG03I	Industrial Training Placement (1)	0	0	0	0	0
Total		**0**	**0**	**0**	**0**	**0**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY3 - Semester (1)						
SCIB07I	Probability and Statistics	10	2	2	0	4
COMP07I	Internet Programming	10	2	1	2	5
COMP11I	Computer Graphics	10	2	1	2	5
COMP02H	Modelling and Simulation Techniques	10	2	1	2	5
COMP03H	Microprocessor Design	10	2	1	2	5
ELEC09I	Introduction to Communications Systems	10	2	1	2	5
Total		**60**	**12**	**7**	**10**	**29**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
DY3 - Semester (2)						
COMP04H	Digital Control Systems	10	2	1	2	5
ELEC01H	Digital Signal Processing	10	2	1	2	5
COMP12I	Data Communications and Computer Networks	10	2	1	2	5
COMP13I	Computer Controlled Systems	10	2	1	2	5
COMP14I	Analysis and Design of Algorithms	10	2	1	2	5
COMP09I	Operations Research	10	2	2	0	4
Total		**60**	**12**	**7**	**10**	**29**

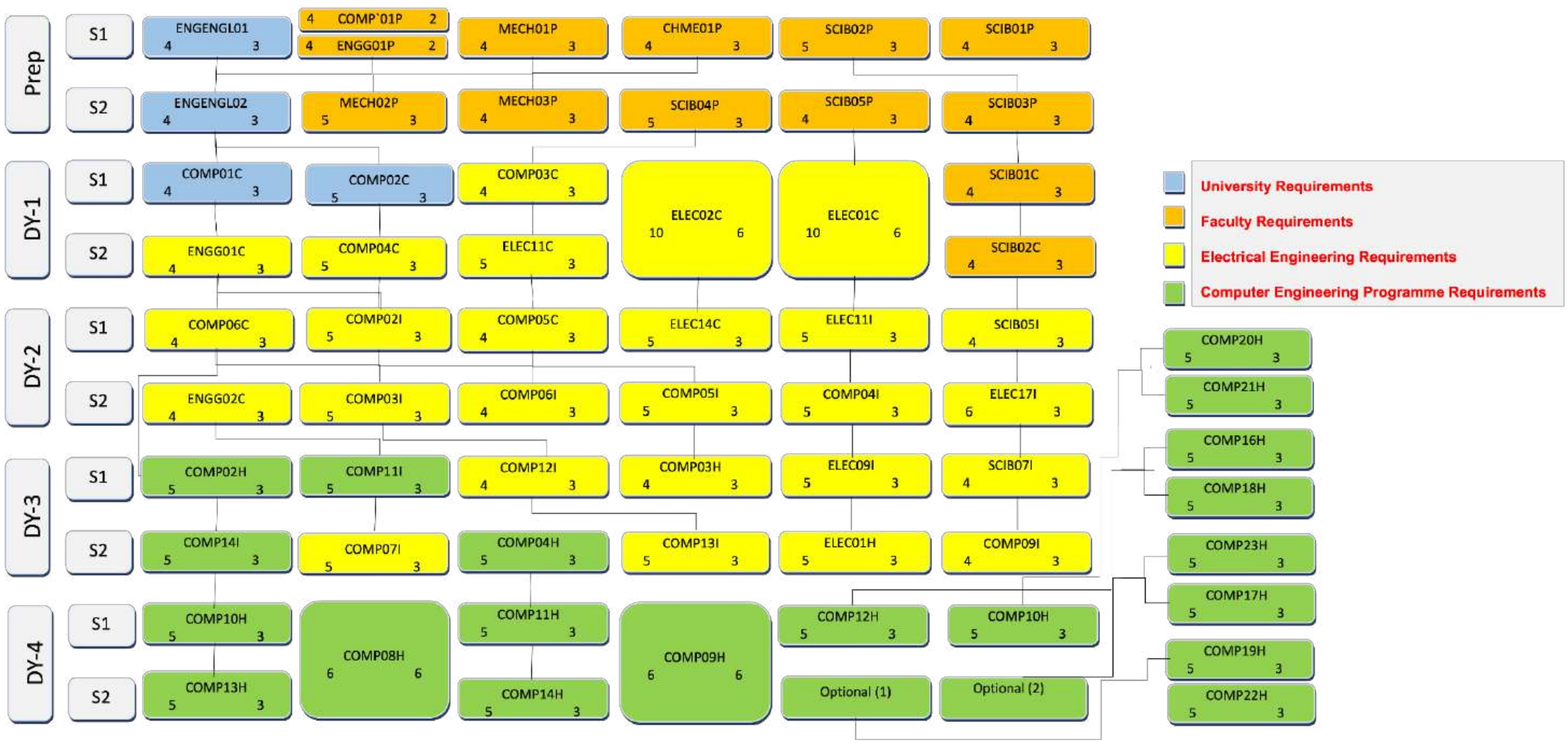
Code	Course Title	Cr	Contact Hours Lec	Tut	Lab	TT
	DY3 - Summer Semester					
ENGG07H	Industrial Training Placement (2)	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
	DY4 - Semester (1)					
COMP08H	Research Project [1:1]	10	0	0	6	6
COMP09H	Design Project [1:1]	10	0	0	6	6
COMP10H	Mobile Computing	10	2	1	2	5
COMP11H	Distributed Systems	10	2	1	2	5
COMP12H	Human-Computer Interaction	10	2	1	2	5
COMP13H	Computer Vision	10	2	1	2	5
	Total	**60**	**8**	**4**	**20**	**31**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
	DY4 - Semester (2)					
COMP08H	Research Project [1:1]	10	0	0	6	6
COMP09H	Design Project [1:1]	10	0	0	6	6
COMP14H	Compiler Design	10	2	1	2	5
COMP15H	Embedded Systems	10	2	1	2	5
	Optional course (1)	10	2	1	2	5
	Optional course (2)	10	2	1	2	5
	Total	**60**	**8**	**4**	**20**	**32**

Code	Course Title	Cr	Contact Hours			
			Lec	Tut	Lab	TT
	Optional Courses					
COMP16H	Digital Image Processing	10	2	1	2	5
COMP17H	Artificial Neural Networks	10	2	1	2	5
COMP18H	Design of Web-Based Systems	10	2	1	2	5
COMP19H	Wireless Sensor Networks	10	2	1	2	5
COMP20H	Software Engineering (2)	10	2	1	2	5
COMP21H	Multimedia Systems	10	2	1	2	5
COMP22H	Systems Security	10	2	1	2	5
COMP23H	Selected Topics in Computer Engineering	10	2	1	2	5
	Total	**80**	**16**	**8**	**16**	**40**

Programme Courses Tree



9. An Overview of Teaching, Learning and Assessment Strategies to Enable Competencies to be Achieved and Demonstrated

A. Learning and Teaching Methods

Throughout the programme students are encouraged to undertake independent reading both to supplement and consolidate what is being taught and to broaden, develop and reinforce their competencies throughout the programme. Targeted delivery may come from a variety of sources such as

1. Lectures.
2. Tutorials.
3. Problem solving classes.
4. Laboratory sessions
5. Specialized sessions on electronic design automation (EDA) tools.
6. Self-study session.

Further support is gained through study skills delivered as a matter of policy within both the English language programme and individual modules.

B. Assessment

Competencies are tested and assessed throughout the programme using a variety of forms that typically include a combination of

1. Unseen written examinations.
2. Class test.
3. Practical Assessment.
4. Projects.
5. VIVA (Panel).
6. Technical reports.
7. Dissertation.
8. Student's Efforts (Supervisor).
9. Interim Report (Panel
10. Design Brief (Supervisor).
11. Group presentation.

Coursework forms a particularly important part of the assessment. This method of assessment can

(i) be used to strongly motivate independent learning.
(ii) improve student planning and time management skills and
(iii) to develop the comprehension and usage of technical English (particularly important for students at the BUE).

Examinations show how well the student can demonstrate their mastery of an area of scholarly knowledge by selecting appropriate material from memory and applying it to an unseen question in a limited time period. Coursework allows the student to demonstrate wider academic skill of focused scholarly research, drafting, editing and polished writing.

Applied skills are tested and assessed throughout the programme using a combination of coursework assignments, design studies, laboratory logbooks, project reports and/or papers, project logbooks and work placement reports.

10. Support for Learning

- All resources needed for the courses are updated and uploaded on the E-Learning (https://learn1.bue.edu.eg/login/index.php)
- The tutorials are designed by the module leaders (course leader) to ensure a strong link with module contents to provide students with useful, challenging, good support & practice for the material discussed in lectures.
- Students are provided with feedback related to their submissions within two weeks of submissions.
- For assessed work, feedback is provided in the form of individual written feedback on coursework and as a discussion during tutorials.
- For developmental work, feedback is delivered in the form of dialogue between students and staff in tutorials as well as individual feedback provided in tutorials.
- Weaker students are supported with additional remedial classes and clinics during office hours to uplift their performance.
- A generic exam feedback is developed and posted on E-learning after releasing scripts to students each semester. Students will be notified via e-mail once generic feedback is uploaded.
- Institutional services including the Library, Welfare Counsellor, Faculty services including a Student Support Officer and Programme Handbook.

11. Crisis and Disaster Management

The faculty of Engineering manages crisis and disaster through the following:

1. Crisis and Disaster Committee
2. Contingency Plan
3. Health and Safety
4. Contact Trees

12. Entry Requirements

In addition to the requirements listed in Part-B, students are required to successfully complete of the Engineering Preparatory Year and passing the entry exam which evaluates student's abilities and architectural skills.

Other admission routes may be considered in accordance with the University's regulations as defined in the Undergraduate Academic Regulations.

13. Quality Assurance and Programme Enhancement

- In accordance with the University's Quality Assurance procedures, as defined in the Annual Quality Assurance and Enhancement Cycle.
- Feedback on all aspects of this programme will be obtained via standard procedures from the University's framework for quality assurance, as defined in the Annual Quality and Enhancement Cycle.

14. Programme Management

- Head of Department
- Programme Director

The programme management is mainly carried out by the HoD. However, the main task of the PD is to monitor the sound delivery of the programme, and the maintenance of academic standards and quality, in line with the University's Strategic Plan for Teaching and Learning.

In addition to the previous, monthly Departmental meetings are carried out with all department's staff members. Related issues are raised for in-depth analysis and discussion to the FTLC that in turn raises with the UTLC and Senate for final decision.

15. Appendices

1. Mapping matrix of Programme Mission vs. Faculty Mission

			Faculty Mission			
			1. Provide broad spetrum of eduaction with British ethos.	2. Encourages high quality research outcomes.	3. Collaborate with UK and global partners to provide internationally recognized quality degree.	4. Contribute to the community development.
Programme Mission	1	Provide highest quality, up-to-date education based with British ethos corresponding to the QAA standards in the fields of modern computer engineering technologies.	X			X
	2	Equipe graduates from the computer engineering programme with adequate long-life learning skills.	X			
	3	Enable graduate from the computer engineering programme with potential job opportunities on both the national as well as the international job market.			X	
	4	Produce high level research outcomes in the domain the specialization.		X		

2. Mapping matrix of Programme Mission vs. Graduates Attributes

			Graduate Attributes											
			1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.	2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.	3. Behave professionally and adhere to engineering ethics and standards.	4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance	5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.	7. Use techniques, skills, and modern engineering tools necessary for engineering practice.	8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.	9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.	10. Demonstrate leadership qualities, business administration and entrepreneurial skills.	11. Develop appropriate research skills in the field of Computer Engineering	12. Master the use of industry-standard specialized relevant Electronic Design Automation (EDA) software tools
Programme Mission	1	Provide highest quality, up-to-date education based with British ethos corresponding to the NAQAAE standards in the fields of modern computer engineering technologies.	X	X										X
	2	Equipe graduates from the computer engineering programme with adequate long-life learning skills.	X						X	X				
	3	Enable graduate from the computer engineering programme with potential job opportunities on both the national as well as the international job market.			X	X	X	X				X		
	4	Produce high level research outcomes in the domain the specialization.									X		X	

3. Mapping matrix of Programme Mission vs. Programme Competencies

Programme Competencies — General Competencies (A-Level)

Programme Mission	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.
1 Provide highest quality, up-to-date education based with British ethos corresponding to the QAA standards in the fields of modern computer engineering technologies.	X							X		
2 Equipe graduates from the computer engineering programme with adequate long-life learning skills.	X	X							X	X
3 Enable graduate from the computer engineering programme with potential job opportunities on both the national as well as the international job market.			X	X		X	X			
4 Produce high level research outcomes in the domain the specialization.					X					

Programme Competencies — Discipline Competencies (B-Level) [Electrical Engineering]

Programme Mission	Select, model, and analyse electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.	Design, model and analyse an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and Services.
1	X	X	X	X	
2					
3					X
4					

Programme Competencies — Programme Competencies (C-Level) Computer Engineering

Programme Mission	Proposing various computer-based solutions to business system problems. Cost-benefit analysis that should be performed especially in sensitive domains where direct and indirect costs are involved.	Innovating solutions based on non-traditional thinking and the use of latest technologies.	Use appropriate specialised computer software, computational tools, and design packages throughout the phases of the life cycle of system development.	Write computer programs on professional levels achieving acceptable quality measures in software.
1	X		X	X
2		X		X
3	X	X		
4				

4. Mapping matrix of Programme Aims (Objectives) vs. Faculty Aims (Objectives).

			Faculty Aims (Objectives)		
			1. Teaching & Learning	2. Research	3. Community Services & Enterprise
Programme Aims (Objectives)	1	Continuously update the programme to incorporate recent trends in the field of specialization.	1.1, 1.2, 1.3	2.8, 2.10	3.1, 3.2, 3.4
	2	Establish cooperation protocols with, industrial enterprises, educational and research institutes.	1.10,1.11, 1.13	2.4, 2.7, 2.11	3.1, 3.2, 3.5, 3.8
	3	Develop postgraduate programme in focus areas related to the field of specialization.	1.2, 1.3	2.1, 2.2, 2.3, 2.4	3.1, 3.7
	4	Continue the improvement of research outcomes.	1.11, 1.13	.8, 2.9, 2.10, 2.11, 2.1	3.5, 3.7
	5	Apply for and acquire external funding either from national or international funding entities.	1.13	2.11, 2.12	3.3, 3.6
	6	Provide the job market with a competent graduate who is able to excel in recent technologies in the field of specialization.	1.1, 1.2, 1.4, 1.13	2.1, 2.2, 2.8	3.2, 3.4

5. Mapping matrix of Programme Aims (Objectives) vs. Graduates Attributes

		Graduate Attributes											
		1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.	2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.	3. Behave professionally and adhere to engineering ethics and standards.	4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance	5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;	6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.	7. Use techniques, skills, and modern engineering tools necessary for engineering practice.	8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.	9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.	10. Demonstrate leadership qualities, business administration and entrepreneurial skills.	11. Develop appropriate research skills in the field of Computer Engineering	12. Master the use of industry-standard specialized relevant Electronic Design Automation (EDA) software tools
1	Continuously update the programme to incorporate recent trends in the field of specialization.	X	X				X				X		
2	Establish cooperation protocols with, industrial enterprises, educational and research institutes.			X	X								
3	Develop postgraduate programme in focus areas related to the field of specialization.						X	X					
4	Continue the improvement of research outcomes.					X						X	
5	Apply for and acquire external funding either from national or international funding entities.											X	
6	Provide the job market with a competent graduate who is able to excel in recent technologies in the field of specialization.	X	X			X		X	X	X	X		X

6. Mapping Matrix of Programme Aims (Objectives) vs Programme Competencies

Programme Aims (Objectives)		Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	Select, model, and analyse electrical power systems applicable t	Design, model and analyse an electrical/electronic/digital system	Design and implement elements, modules, sub-systems, or syst	Estimate and measure the performance of an electrical/electronic	Adopt suitable national and international standards and codes to c	Proposing various computer-based solutions to business system problems. Cost-benefit analysis that should be performed especially in sensitive domains where direct and indirect costs are involved.	Innovating solutions based on non-traditional thinking and the use of latest technologies.	Use appropriate specialised computer software, computational tools, and design packages throughout the phases of the life cycle of system development.	Write computer programs on professional levels achieving acceptable quality measures in software.
		Programme Competencies																		
		General Competencies (A-Level)										**Discipline Competencies (B-Level) [Electrical Engineering]**					**Programme Competencies (C-Level) Computer Engineering**			
1	Continuously update the programme to incorporate recent trends in the field of specialization.	X	X									X	X	X	X				X	
2	Establish cooperation protocols with, industrial enterprises, educational and research institutes.			X			X	X								X	X			
3	Develop postgraduate programme in focus areas related to the field of specialization.			X							X							X		
4	Continue the improvement of research outcomes.					X											X			
5	Apply for and acquire external funding either from national or international funding entities.					X											X			
6	Provide the job market with a competent graduate who is able to excel in recent technologies in the field of specialization.	X	X		X				X	X	X	X	X	X	X	X	X	X	X	X

7. Mapping matrix of Programme Competencies vs. Graduate Attributes

		Programme Competencies: General Competencies (A-Level)										Discipline Competencies (B-Level) [Electrical Engineering]					Programme Competencies (C-Level) Computer Engineering			
Gradutes Attributes		Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	Select, model, and analyse electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.	Design, model and analyse an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and Services.	Proposing various computer-based solutions to business system problems. Cost-benefit analysis that should be performed especially in sensitive domains where direct and indirect costs are involved.	Innovating solutions based on non-traditional thinking and the use of latest technologies.	Use appropriate specialised computer software, computational tools, and design packages throughout the phases of the life cycle of system development.	Write computer programs on professional levels achieving acceptable quality measures in software.
1	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.	X	X									X	X	X	X					X
2	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.	X	X	X								X	X	X	X	X				
3	Behave professionally and adhere to engineering ethics and standards.							X												
4	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance							X												
5	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;										X					X				
6	Value the importance of the environment, both physical and natural, and work to promote sustainability principles.			X	X															
7	Use techniques, skills, and modern engineering tools necessary for engineering practice.		X															X	X	X
8	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.				X												X	X		
9	Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.					X			X	X										
10	Demonstrate leadership qualities, business administration and entrepreneurial skills.						X			X										
11	Develop appropriate research skills in the field of Computer Engineering.					X														
12	Master the use of industry-standard specialized relevant Electronic Design Automation (EDA) software tools.													X						X

8. Mapping matrix of Courses vs. Programme Competencies (include Prep Year)

Semester	Modules		Programme Competencies																		
	Title	Code	General Competencies (A-Level)										Discipline Competencies (B-Level) [Electrical Engineering]					Programme Competencies (C-Level) Computer Engineering			
			A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	B.1	B.2	B.3	B.4	B.5	C.1	C.2	C.3	C.4
Prep Year Semester 1	Mathematics for Engineers (1)	SCIB01P	X				X				X										
	Introductory Physics	SCIB02P		X				X		X											
	Engineering Mechanics	MECH01P	X	X			X														
	Chemistry for Engineers	CHME01P		X	X				X												
	Introduction to Computing	COMP01P				X						X									
	English for Academic Purposes	ENGENGL01								X	X	X									
	Engineering Ethics and Human Rights	ENGG01P				X			X	X											
Prep Year Semester 2	Mathematics for Engineers (2)	SCIB03P	X				X				X										
	Electricity and Magnetism	SCIB04P		X					X	X											
	Algebra and Geometry	SCIB05P	X		X		X														
	Engineering Drawing and Descriptive Geometry	MECH02P			X	X															
	Production Technology I	MECH03P				X	X	X													
	English and Academic Writing	ENGENGL02					X		X	X	X	X									
DY1 Semester & 2	Electric Circuits [1:1]	ELEC01C												X	X						
	Electronics [1:1]	ELEC02C												X	X						
DY1 Semester 1	Report Writing and Data Presentation	COMP01C				X			X	X		X									
	Calculus	SCIB01C	X	X			X														
	Programming and Software Design	COMP02C				X		X				X									
	Computer Organization	COMP03C												X	X						
DY1 Semester 2	Introduction to Data Structure and Algorithms Design	COMP04C												X	X						
	Differential Equations	SCIB02C	X	X			X														
	Engineering Project Management	ENGG01C			X	X	X		X	X	X										
	Electronic Measurements	ELEC11C														X	X				
DY2 Semester 1	Discrete Mathematics	SCIB05I														X	X				
	Electrical Energy Systems	ELEC11I											X			X					
	Signals & Systems	ELEC14C														X	X				
	Operating Systems	COMP02I												X	X						
	Communications Skills	COMP06C															X				
	Digital Design	COMP05C											X		X						
DY2 Semester 2	Software Engineering (1)	COMP03I													X		X				
	Control System Design	COMP04I											X			X					
	Computer Architecture	COMP05I												X		X					
	Engineering Economics	ENGG02C													X		X				
	Database Systems	COMP06I												X	X						
	Digital Electronics	ELEC17I												X		X					
Summer Training (1)	Industrial Training Placement (1)	ENGG03I											X	X	X	X	X	X	X	X	
DY3 Semester 1	Probability and Statistics	SCIB07I														X	X				
	Internet Programming	COMP07I																	X	X	
	Computer Graphics	COMP11I																X			X
	Modelling and Simulation Techniques	COMP02H																	X	X	
	Microprocessor Design	COMP03H																	X		X
	Introduction to Communications Systems	ELEC09I														X	X				
DY3 Semester 2	Digital Control Systems	COMP04H																X		X	
	Digital Signal Processing	ELEC01H													X		X				
	Data Communications and Computer Networks	COMP12I														X	X				
	Computer Controlled Systems	COMP13I											X			X					
	Analysis and Design of Algorithms	COMP14I																		X	X
	Operations Research	COMP09I														X	X				
Summer Training (2)	Industrial Training Placement (2)	ENGG07H											X	X	X	X	X	X	X	X	
DY4 Semester 1 & 2	Research Project [1:1]	COMP08H																X	X	X	X
	Design Project [1:1]	COMP09H																X	X	X	X
DY4 Semester 1	Mobile Computing	COMP10H																X			X
	Distributed Systems	COMP11H																X		X	
	Human-Computer Interaction	COMP12H																X	X		
	Computer Vision	COMP13H																X			X
DY4 Semester 2	Compiler Design	COMP14H																		X	X
	Embedded Systems	COMP15H																	X		X
	Optional Course (1)																				
	Optional Course (2)																				
Optional Courses (1) and (2)	Digital Image Processing	COMP16H																X		X	
	Artificial Neural Networks	COMP17H																	X		X
	Design of Web-Based Systems	COMP18H																X			X
	Wireless Sensor Networks	COMP19H																	X	X	
	Software Engineering (2)	COMP20H																	X		X
	Multimedia Systems	COMP21H																X			X
	Systems Security	COMP22H																X		X	
	Selected Topics in Computer Engineering	COMP23H																X	X	X	X

9. Teaching and Learning methods vs. Programme Competencies

Teaching and Learning		Programme Competencies																		
		General Competencies (A-Level)										Discipline Competencies (B-Level) [Electrical Engineering]					Programme Competencies (C-Level) Computer Engineering			
		Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	Select, model, and analyse electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.	Design, model and analyse an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and Services.	Proposing various computer-based solutions to business system problems. Cost-benefit analysis that should be performed especially in sensitive domains where direct and indirect costs are involved.	Innovating solutions based on non-traditional thinking and the use of latest technologies.	Use appropriate specialised computer software, computational tools, and design packages throughout the phases of the life cycle of system development.	Write computer programs on professional levels achieving acceptable quality measures in software.
1	Lectures	X									X	X	X	X	X	X				
2	Tutorials	X							X	X	X	X	X	X	X	X				
3	Problem solving sessions	X							X	X	X	X	X	X	X	X				
4	Laboratory sesssions		X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X
5	Specialized sessions on electronic design automation (EDA) tools		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Self-study session		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

10. Assessment methods vs Programme Competencies.

		Programme Competencies																		
		General Competencies (A-Level)										Discipline Competencies (B-Level) [Electrical Engineering]					Programme Competencies (C-Level) Computer Engineering			
		Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	Practice research techniques and methods of investigation as an inherent part of learning.	Plan, supervise and monitor implementation of engineering projects.	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	Select, model, and analyse electrical power systems applicable to the specific discipline by applying the concepts of generation, transmission, and distribution of electrical power systems.	Design, model and analyse an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	Design and implement elements, modules, sub-systems, or systems in electrical/electronic/digital engineering using technological and professional tools.	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and evaluate its suitability for a specific application.	Adopt suitable national and international standards and codes to design, build, operate, inspect, and maintain electrical/electronic/digital equipment, systems, and Services.	Proposing various computer-based solutions to business system problems. Cost-benefit analysis that should be performed especially in sensitive domains where direct and indirect costs are involved.	Innovating solutions based on non-traditional thinking and the use of latest technologies.	Use appropriate specialised computer software, computational tools, and design packages throughout the phases of the life cycle of system development.	Write computer programs on professional levels achieving acceptable quality measures in software.
Assessment Methods 1	Unseen written examination	X		X								X	X	X			X	X		
2	Class test	X		X								X	X	X			X	X		X
3	Practical Assessment		X	X							X	X	X	X	X	X			X	X
4	Projects		X							X	X	X	X	X	X	X			X	X
5	VIVA (Panel)		X		X	X		X	X										X	X
6	Technical reports			X	X	X		X	X						X	X				
7	Dissertation			X	X	X		X	X	X	X						X	X	X	X
8	Student's Efforts (Supervisor)			X	X	X		X	X		X						X	X	X	X
9	Interim Report (Panel)					X	X	X	X		X						X	X	X	X
10	Design Brief (Supervisor)						X	X	X	X	X						X	X	X	X
11	Group presentation				X		X	X	X	X	X						X	X	X	X

11. Mapping matrix of Programme competencies vs. Learning outcomes Accreditation of Higher Education Programmes (AHEP), fourth edition, August 2020

Programme Compentencies		Learning outcomes – Accreditation of Higher Education Programmes (AHEP), fourth edition, August 2020
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and	**B1.** Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	**B2.** Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles **B3.** Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	**B5.** Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**B4.** Select and evaluate technical literature and other sources of information to address broadly-defined problems **B7.** Evaluate the environmental and societal impact of solutions to broadly-defined problems **B8.** Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct **B9.** Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity
A5	Practice research techniques and methods of investigation as an inherent part of learning.	**B6.** Apply an integrated or systems approach to the solution of broadly-defined problems
A6	Plan, supervise and monitor implementation of engineering projects.	**B16.** Function effectively as an individual, and as a member or leader of a team
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**B16.** Function effectively as an individual, and as a member or leader of a team
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**B17.** Communicate effectively with technical and non-technical audiences
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**B15.** Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	**B15.** Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters
B1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.	**B12.** Use practical laboratory and workshop skills to investigate broadly-defined problems
B2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	**B13.** Select and apply appropriate materials, equipment, engineering technologies and processes
B3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.	**B13.** Select and apply appropriate materials, equipment, engineering technologies and processes **B15.** Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters
B4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.	**B12.** Use practical laboratory and workshop skills to investigate broadly-defined problems
B5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and Services	**B8.** Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct **B9.** Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity **B10**.Adopt a holistic and proportionate approach to the mitigation of security risks **B11.** Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion
C1	Proposing various computer-based solutions to business system problems. Cost-benefit analysis that should be performed especially in sensitive domains where direct and indirect costs are involved.	**B13.** Select and apply appropriate materials, equipment, engineering technologies and processes **B14.** Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems **B15.** Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters
C2	Innovating solutions based on non-traditional thinking and the use of latest technologies.	**B13.** Select and apply appropriate materials, equipment, engineering technologies and processes **B14.** Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems
C3	Use appropriate specialised computer software, computational tools, and design packages throughout the phases of the life cycle of system development.	**B3.** Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed **B13.** Select and apply appropriate materials, equipment, engineering technologies and processes
C4	Write computer programs on professional levels achieving acceptable quality measures in software.	**B3.** Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed

12. Mapping matrix of Programme competencies vs. Competence and Commitment (UK-SPEC), fourth edition, August 2020

Programme Compentencies		The UK Standard for Professional Engineering Competence and Commitment (UK-SPEC), fourth edition, August 2020
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. the practical applications of these underlying principles to architectural engineering and construction	A1. Have maintained and extended a sound theoretical approach to the application of technology in engineering practice
		A2. Use a sound evidence- based approach to problem- solving and contribute to continuous improvement.
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate	B2. Contribute to the design and development of engineering solutions
		B3. Implement design solutions for equipment or processes and contribute to their evaluation.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks
		B3. Implement design solutions for equipment or processes and contribute to their evaluation.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	E1.Understand and comply with relevant codes of conduct
		E2, Understand the safety implications of their role and manage, apply and improve safe systems of work
		E3. Understand the principles of sustainable development and apply them in their work
A5	Practice research techniques and methods of investigation as an inherent part of learning.	A2. Use a sound evidence- based approach to problem- solving and contribute to continuous improvement.
A6	Plan, supervise and monitor implementation of engineering projects.	C1. Plan the work and resources needed to enable effective implementation of engineering tasks and projects
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	C3. Manage teams, or the input of others, into own work and assist others to meet changing technical and management needs
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	D1. Communicate effectively with others, at all levels, in English
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	E4. Carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	E4. Carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice
B1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.	A2. Use a sound evidence- based approach to problem- solving and contribute to continuous improvement.
B2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	B2. Contribute to the design and development of engineering solutions
B3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using	B3. Implement design solutions for equipment or processes and contribute to their evaluation.
B4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks
B5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and Services	E1.Understand and comply with relevant codes of conduct
		E2, Understand the safety implications of their role and manage, apply and improve safe systems of work
		E3. Understand the principles of sustainable development and apply them in their work
		E4. Carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice
		E5. Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner.
C1	Proposing various computer-based solutions to business system problems. Cost-benefit analysis that should be performed especially in sensitive domains where direct and	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks
		B2. Contribute to the design and development of engineering solutions
C2	Innovating solutions based on non-traditional thinking and the use of latest technologies	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks
		B2. Contribute to the design and development of engineering solutions
C3	Use appropriate specialized computer software, computational tools, and design packages throughout the phases of the life cycle of system development	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks
		B3. Implement design solutions for equipment or processes and contribute to their evaluation.
C4	Write computer programs on professional levels achieving acceptable quality measures in software.	B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks

مواصفات برنامج الهندسة الميكانيكية

Specifications of Mechanical Engineering Programme

Mechanical systems are systems which involve moving elements such as components or fluids. Mechanical Engineering is the scientific discipline responsible for the design, manufacture, management and maintenance of mechanical systems. Mechanical systems maybe very small or very large. Mechanical Engineering graduate possess the following:

- Portability and flexibility of capabilities: Knowledge/skill makes graduates marketable in many areas.
- Job Security: Mechanical problems will always exist.
- Management: Lead multi-disciplinary teams.
- Entrepreneurship: Broad knowledge base = more options, more applications for creativity.

This specification provides the main features of the programme competencies that a typical student might reasonably be expected to achieve and demonstrate if full advantage is taken of the learning opportunities that are provided.

1. Basic Information

1	**Programme title**	**Mechanical Engineering**
2	**Name of the final award**	**BSc with honours [validated by UK partner]**
3	**Awarding body/institution**	**The British University in Egypt**
4	**Faculty**	**Engineering**
5	**Department**	**Mechanical Engineering**
6	**Dean (HoD)**	**Prof. Maguid Hassan**
7	**Head of Department**	**Prof. Ayman Salah Abbas**
8	**Programme Director (PD)**	**Dr George Fam**
9	**Professional, Statutory and Regulatory Body Accreditation**	**Supreme Council of Universities, NAQAEE, Egyptian Engineering Syndicate**
10	**Date of last internal review and updates**	**January 2021**
10	**Date of initial internal review and updates**	**March 2017**
11	**Approval date to adopt NARS 2018 by:** **- Departmental Council** **- Faculty Council**	**- 22 December 2020** **- 18 January 2021**

2. Programme Mission

The mission of Mechanical Engineering programme is to produce challenging Mechanical Engineers with high capability and skills which enable them to compete on the National and International levels. In addition, the department mission is to produce mechanical graduates having a solid foundation in mechanical engineering principles, good command in communication and problem solving abilities, and motivation and ability for lifelong growth in their professional career. The programme also aspires to encourage the development and maintenance of world-class research in selected focus areas within the engineering discipline which complements the educational mission and addresses the evolving needs of industry and society.

3. Programme Aims

To offer an honours degree programme in the field of Mechanical Engineering. Not only does this programme seek to maintain full validation by a UK partner university but also to be fully accredited by Egyptian Supreme Council of Universities and possible UK professional bodies especially the IMechE. It will provide engineering community (industry, academia, government, design offices) both within Egypt and internationally, with high quality graduates. These graduates will have a profile that includes a strong academic background in fundamental basic sciences, and mechanical engineering sciences, combined with the analytical, technical and professional skills necessary to operate successfully in the above-mentioned areas.

4. Distinctive Features of the Programme

The BUE delivers programmes based on a British philosophy of education. This results in programmes that are very much focused on the student rather than those who deliver the material. Graduates from UK programmes typically exhibit:

- the ability to think creatively and with strong problem solving skills;
- high level key and transferable skill sets;
- the ability to maintain independently a high level of professional and subject specific competence (often through CPD);
- technical competence;
- the ability to conceptualise problems at a high level (i.e. to see the big picture);
- diligent and ethical working practices;
- the ability to work both independently and as part of a team;
- flexibility and the ability to apply their subject specific knowledge to fields outside their own;
- the ability to face any new professional or academic challenge and use available resources to create innovative solutions.

Furthermore, this programme is delivered both with a local and UK flavour giving students the opportunity to gain an appreciation of national and international perspectives on many aspects of professional life. This includes management techniques, business culture, legal frameworks and standards.

Built on top of institutional quality assurance is subject level validation and the Faculty is committed to ensuring that its UK validating partners confirm that its degree programme is in line with UK standards. An indicator of this will be the dual award of both an Egyptian BSc and a BEng from a UK university in Mechanical Engineering.

The BUE will be seeking accreditation of this degree programme with the Institute of Mechanical Engineers, the UK's leading professional body for this engineering discipline. The IMechE is the

largest professional engineering society in Europe and the second largest of its type in the world. Please refer to http://www.imeche.org for more information on the IMechE.

Accredited degree programmes are the preferred and the BUE BSc Mechanical Engineering provides a partial fulfilment track route for those who aim to obtain the professional qualification of Chartered Engineer (CEng). For a brief overview on the Chartered Engineering qualification and why it is important please see: http://www.imeche.org/membership/membership-registration/How-to-apply/member/CEng-process-and-forms. Alternatively, BUE Mechanical Engineering graduates qualify for the Incorporated Engineer (IEng) qualification from the IMechE: http://www.imeche.org/membership-registration/become-a-member/incorporated- engineer

At the time of writing, and to the best of our knowledge, this combination of a programme based on a learning culture fostering key and transferable skill sets, in addition to technical ones, together with academic and professional accreditation, makes our programme in Mechanical Engineering quite unique in both Egypt and the surrounding region.

5. Relevant Subject Benchmark Statements and other External and Internal Reference Points Used to achieve Programme Outcomes

To ensure that the programme complies with the requirements of relevant national and international professional institutions/bodies, and to qualify graduates to apply for memberships in respective institutions and/or gain Chartered Engineer status, the following are used as reference points to inform the programme outcomes:

- Frameworks for Higher Education Qualifications in England Wales and Northern Ireland– (August 2008) http://www.qaa.ac.uk/en/Publications/Documents/Framework-Higher-Education-Qualifications-08.pdf .
- The Quality Assurance Agency for Higher Education, "Subject benchmark statement – Engineering",(February 2015) http://www.qaa.ac.uk/en/Publications/Documents/SBS-engineering-15.pdf .
- Engineering Council UK, "UK-SPEC" particularly "The accreditation of Higher Education Programmes".(May 2014) http://www.engc.org.uk/engcdocuments/internet/Website/Accreditation%20of%20Higher%20Education%20Programmes%20third%20edition%20%281%29.pdf
- IMechE professional registration http://www.imeche.org/membership/professional-development/Gaining-registration especially the IMechE Degree Accreditation available at http://www.imeche.org/membership/employers-and-accreditation/university-accreditation

- The Mechanical programme originally adopted NARS 2009 and upon the issuing of national Academic Reference Standards (NARS 2018 for Engineering 2nd edition), the programme performed a gap analysis with additional action plan to bridge all gaps if any. Hence, the programme specification is updated to comply with National Academic Reference Standards (NARS 2018) developed by The National Authority of Quality Assurance and Accreditation of Education (NAQAAE), https://admin.naqaae.eg/api/v1/archive/download/34733

6. Graduate Attributes

The creative way of approaching all engineering challenges is being seen increasingly as a 'way of thinking' which is generic across all disciplines. The Mechanical Engineering Programme adopted the NARS 2018 attributes for Engineering. The graduates of engineering should have the ability to:

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.
2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.
3. Behave professionally and adhere to engineering ethics and standards.
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.
7. Use techniques, skills, and modern engineering tools necessary for engineering practice.
8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies.
9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.

In addition to the general attributes of engineer, the mechanical engineer must be able to:

i. Ability to take a systematic approach and be logical and practical to address complex concepts.
ii. Proficient in dealing with engineering problems through sustainable solutions and develop flexible strategies for creativity and innovation.
iii. Competent in applying numerical, computational, analytical and technical skills at solving problems by using appropriate tools.
iv. Awareness and appreciation of codes of conduct, ethical, social, cultural, environmental, risk analysis, cost conscious, health and safety issues, and wider professional responsibilities.
v. Capacity to appreciate the nature of business and enterprise in the creation of economic and social value.
vi. Adept in understanding the globalisation of engineering, commerce and communication.
vii. Capable in acting in a professional manner, working effectively as part of teams, communicate effectively, and act responsibility and make sound management judgements.

University Requirements

The university is considered a core of Human Thinking at its highest level, and the source of investment and development of human resources. It is concerned with the rise of the Arabian Civilization and the Historical Heritage of the Egyptian Society, and its traditions. It is also concerned with the education of Religion, Morals and Nationalism (Egyptian National Law for Universities, Law 49 for Year 1972). Therefore, BUE graduates should be able to or aware of:

- National, regional, and international contemporary issues, to have an intellectual and enlightened personality and to interact effectively in the community through different communication skills.
- To achieve this goal, BUE has designed several courses planned to build the student personality, develop his/her skills, and increase his/her awareness of different topics. These courses are listed in Table 6.

Faculty Requirements

The Mechanical programme offered at the Faculty of Engineering, the British University in Egypt, is an Engineering Programme. The graduates have the privilege of being Engineers and are automatically enrolled in the Egyptian Engineering Syndicate (EES). The graduates are also entitled to take the Fundamentals of Engineering Exam offered by the National Council of Examiners for Engineering and Surveying (NCEES), based on the agreement between EES and NCEES.

Competencies for Engineering Graduates

According to the **National Academic Reference Standards (NARS-2018),** the **Engineering Graduate must be able to (A-Level):**

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
A2. Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.
A5. Practice research techniques and methods of investigation as an inherent part of learning.
A6. Plan, supervise and monitor implementation of engineering projects.
A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
A9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

- Courses required to achieve these competencies (A-level) are listed in Table 7

Discipline Requirements (Mechanical Engineering Requirements)

According to the National Academic Reference Standards (NARS-2018), each mechanical engineering graduate must meet specific competencies. Thus, in addition to the Competencies of all Engineering Programmes (A-Level), the Mechanical Engineering graduate must be able to (B-Level):

B1 Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.

B2 Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.

B3 Select conventional mechanical equipment according to the required performance.

B4 Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to: design, build, operate, inspect and maintain mechanical equipment and systems.

Courses required to achieve these competencies (B-level) are listed in Table 8

Programme Competencies for UK Requirements:

The Mechanical Engineering Programme adopted the National Reference Standards (NARS) issued in 2018 at the level of competencies (A & B) considering A as general competencies for all engineers and B as specialised competencies for Mechanical Engineering. Given the requirements of the British partner, the Programme also adopted (ARS) at the level of (C) to meet the requirements of QAA, subject benchmark statement: Mechanical Engineering and UK standards for professional engineering competencies. Accordingly, the Mechanical Engineering Programme graduate must be able to:

C1 Use different instruments appropriately and carry-out experimental design, automatic data acquisition, data analysis, data reduction and interpretation, and data presentation, both orally and in the written form.

C2 Evaluate the sustainability and environmental issues related to mechanical power systems.

C3 Use energy efficiently, operate and maintain energy systems.

C4 Apply industrial safety.

C5 Apply and integrate knowledge, understanding and skills of different subjects and available computer software to solve real problems m industries and power stations.

- Courses required to achieve these competencies (C-level) are listed in Table 9

7. Programme Structure, Levels, Modules, Credits and Awards.

Credit Point System

- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) to be awarded a UK validated degree. This is in addition to the specialist courses (modules) and other requirements of the Egyptian Supreme Council of Universities required for the Egyptian degree.
- The program is divided into teaching units called modules (courses), which are each assigned a credit weighting.
- Each module (course) is assigned a Level, number of credits and weighting, this reflects the depth of learning required in the relevant program year.
- A basic 10-credit module (course) requires approximately 100 hours of student effort, which can include 36 hours of formal teaching and laboratory work. The remaining time is for coursework and tutorial completion, student-centred study and assessment.
- Students study modules (courses) with a combined weight of 120 credit points in each year (60 credit points per semester)
- Modules (courses) that are delivered in one semester have their assessment completed within
- the semester in which they are taught. The program is structured such that formal examinations can take place at the end of each semester.

Academic Semesters

- The academic year is divided into two semesters: Semester 1 and Semester 2.
- Each semester is 15-weeks in length.
- Week 13 being a revision week, and weeks 14- 15 being assessment weeks at the end of each
- semester.
- The Academic year includes a summer assessment period where students can resit failed modules (courses).

Program Levels

- The whole program, of total 600 credit points, is divided into four levels (120 credits each) S,4, 5 and 6, according to the Framework for Higher Education Qualifications of UK Degree-Awarding Bodies.
- These levels reflect the depth of learning required in the relevant program year.
- Students are required to complete the relevant number of credits on the Frameworks for Higher Education Qualifications (FHEQ) of the UK Degree-Awarding Bodies to be awarded a UK validated degree, in addition to the Egyptian degree.
- Each program is also divided into four levels of competencies, as per the NARS 2018, as follows:
    - Level 0, university requirements
    - Level A Faculty requirements
    - Level B Discipline requirements
    - Level C Program requirements

Duration of Study

The following rules apply to the maximum registration period:

- Students in Degree Year One can have maximum two years of regular study plus one year as external students.
- Students in Degree Year Two can repeat for one extra year as external students.
- Students in the final year who passed at least 50% of their study load shall be allowed an unlimited number of attempts to pass the remaining credits.

Program Structure

- All taught undergraduate programs at BUE are modular in structure.
- The Program Specification for each programme sets out the specific requirements for each program of study.

8. Conformity of the Mechanical Engineering Programme to Supreme Council of Universities (SCU) Guidelines

The SCU guidelines consists of seven major categories that run throughout the whole programme; namely: Human and Social Sciences; Mathematics and Basic Science, Basic Engineering Science, Applied Engineering Sciences, Computer Applications and ICT, Projects and Practice and Discretionary (Institution character- identifying) Subject with range of weights of [9-12%], [20-26%], [20-23%], [20-22%], [9-11%], [8-11%], and [6-8%] respectively. The credits contribution, of the major categories in the Mechanical programme is presented as follows:

Table 4 Indicative Curricula Content by Subject Area

Total no. of hrs / programme = 600										
Curricula Content by Subject Area		Number of Courses	No of Course / levels					Total no. of hrs / subject area	% of subject area	Total % of NARS
			Prep year	DY1 (hrs)	DY2 (hrs)	DY3 (hrs)	DY4 (hrs)			
A	Humanities and social Science	6	25	0	10	20	0	55	9%	9-12
B	Mathematics and Basic Science	12	70	40	10	0	0	120	20%	20-26
C	Basic Engineering Science	14	20	70	50	0	0	140	23%	20-23
D	Applied Engineering and Design	13	0	0	40	70	20	130	22%	20-22
E	Computer Applications and ICT	6	5	10	10	20	10	55	9%	9-11

Total no. of hrs / programme = 600										
Curricula Content by Subject Area		Number of Courses	No of Course / levels					Total no. of hrs / subject area	% of subject area	Total % of NARS
			Prep year	DY1 (hrs)	DY2 (hrs)	DY3 (hrs)	DY4 (hrs)			
F	**Projects and Practice**	**5**	**0**	**0**	**0**	**10**	**40**	**50**	**8%**	**8-11**
G	**Discretionary (Institution character-identifying) Subject**	**5**	**0**	**0**	**0**	**0**	**50**	**50**	**8%**	**6-8**
	Total No. of hrs /DY	**61**	**120**	**120**	**120**	**120**	**120**	**600**	**100%**	

Table 5 Major Categories of the Mechanical Engineering Programme

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
University Requirements										
Prep	COMP01P	Introduction to Computing	5					X		
Prep	ENGENGL 01	English and Academic Purposes	10	X						
Prep	ENGG01P	Engineering Ethics and Human Rights	5	X						
Prep	ENGENGL 02	English and Academic Writing	10	X						
2	MECH40C	Project Management and Report Writing	10	X						

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
3	MECH40H	Industrial Safety and Environmental Engineering	10	X						
	Level A	**Faculty Requirements**								
Prep	SCIB01P	Mathematics for Engineers (1)	10		X					
Prep	SCIB02P	Introductory Physics	10		X					
Prep	MECH01P	Engineering Mechanics	10		X					
Prep	CHME01P	Chemistry for Engineers	10		X					
Prep	SCIB03P	Mathematics for Engineers (2)	10		x					
Prep	SCIB04P	Electricity and Magnetism	10		x					
Prep	SCIB05P	Algebra and Geometry	10		x					
Prep	MECH02P	Engineering Drawing and Descriptive Geometry	10			X				
Prep	MECH03P	Production Technology I	10			X				
1	MECH01C	Rigid Body Mechanics	10		x					
1	SCIB01C	Calculus	10		x					
1	SCIB02C	Differential Equations	10		x					

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
3	MECH40I	Engineering Economics	10	X						
	Level B	**Discipline Requirements**								
2	MECH07I	Dynamics of Machinery	10			x				
2	MECH60I	Materials Testing and Characterisation	10				X			
3	MECH05I	Product Design and Material Selection	10						X	
3	MECH06I	Machine Design	10				X			
3	MECH20I	Heat and Mass Transfer	10				X			
3	MECH80H	Mechanical Vibrations	10				X			
3	MECH21I	Internal Combustion Engines	10				X			
3	MECH81I	Mechatronics Systems	10					X		
3	MECH42H	Operations Research	10					X		
3	MECH43H	Automatic Control	10				X			
3	MECHXXI	Elective (1)	10				X			
3	MECHXXI	Elective (2)	10				X			
4	MECH20H	Energy Conversion Systems	10				X			
4	MECH44H	Production Planning and Control	10				X			
	Level C	**ARS (UK Requirements)**								
4	MECH41H	Design and Analysis of Experiments	10							X
4	MECH60H	Advanced Materials and Manufacturing	10				X			
4	MECH98H	Group Design Project	10						X	

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
4	MECH99H	Individual Research Project	10						X	
4	MECH98H	Group Design Project	10						X	
4	MECH99H	Individual Research Project	10						X	
4	MECHXXH	Elective (3)	10							X
4	MECHXXH	Elective (4)	10							X
4	MECHXXH	Elective (5)	10							X
4	MECHXXH	Elective (6)	10							X
		Elective Courses								
3 elective	MECH25I	Alternative Energy Systems	10				X			
3 elective	MECH41I	Plant Layout and Material Handling	10				X			
3 elective	MECH70I	Simulation Methods for Mechanical Engineering	10				X			
3 elective	MECH71I	Mechanics of Materials	10				X			
3 elective	MECH72I	Condition Monitoring of Machinery	10				X			
3 elective	MECH82I	Electronic Devices and Circuits	10				X			
3 elective	MECH85I	Robotics	10				X			
4 elective	MECH01H	Tool Design and Manufacture	10							X
4 elective	MECH02H	Engineering Tribology	10							x
4 elective	MECH04H	Reliability and Maintenance Engineering	10							X

Degree Year	Course Code	Course title	Credit Hours	Human and Social Sciences	Mathematics and Basic Science	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary (Institution character-identifying) Subject
4 elective	MECH23H	Design of Vehicles	10							X
4 elective	MECH25H	Computational Fluid Dynamics	10							X
4 elective	MECH26H	Refrigeration and Air Conditioning	10							X
4 elective	MECH27H	Fluid Machinery	10							X
4 elective	MECH28H	Heat Transfer Equipment	10							X
4 elective	MECH61H	Failure Analysis	10							X
4 elective	MECH70H	Supply Chain Management	10							X
4 elective	MECH71H	Simulation of Industrial Systems	10							X
4 elective	MECH72H	Maintenance Management	10							X
4 elective	MECH73H	Advanced Sheet Metal Forming	10							X
4 elective	MECH74H	Analysis of Laminated Composite Materials	10							X
4 elective	MECH75H	Design of Pressure Vessels and Piping	10							X
4 elective	MECH76H	FEM for Engineering Applications	10							X
4 elective	MECH77H	Industrial Process Control	10							X
4 elective	MECH82H	Sensors and Instrumentation	10							X
4 elective	MECH83H	Applied Microcontroller Programming	10							X
4 elective	MECH84H	Artificial Intelligence for Engineering	10							X
Total			181	55	120	140	130	55	50	50
%				9%	20%	23%	22%	9%	8%	8%

9. Programme Courses

Courses required to achieve University Requirements

Table 6 List of University requirements courses.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
COMP01P	Introduction to Computing	5	2	0	2	4
ENGENGL01	English and Academic Purposes	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights	5	2	0	0	2
ENGENGL02	English and Academic Writing	10	0	4	0	4
MECH40C	Project Management and Report Writing	10	2	1		3
MECH40H	Industrial Safety and Environmental Engineering	10	2	1		3
Total University requirements		50	8	10	2	20

Courses Required to achieve the General Competencies of A-level (Faculty Requirements)

A set of courses must be completed as a Faculty Requirement. These courses are divided into Basic Science Courses and Basic Engineering Courses.

Table 7 List of Faculty requirements courses.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
MECH01P	Engineering Mechanics	10	2	2	0	4
CHME01P	Chemistry for Engineers	10	2	1	2	5
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry	10	2	3	0	5
MECH03P	Production Technology I	10	2	2	0	4
MECH01C	Rigid Body Mechanics	10	2	2		4
SCIB01C	Calculus	10	2	2		4
SCIB02C	Differential Equations	10	2	2		4
MECH40I	Engineering Economics	10	2	2		4
Total Faculty Requirements		130	26	24	6	56

Courses Required to achieve Mechanical Engineering Requirements of B-level (Discipline Requirements):

A set of courses must be completed as a Basic Mechanical Engineering Requirement, in the Mechanical Engineering Programme.

Table 8 List of Discipline requirements courses (Mechanical Engineering)

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
MECH02C	Mechanical Graphics and Metrology	10	1	3		4
MECH20C	Introduction to Fluid Mechanics	10	2	2	1	5
MECH60C	Fundamentals of Materials Science and Engineering	10	2	2	2	6
SCIB04C	Modern Physics	10	2	1	2	5
MECH03C	Manufacturing Engineering (1)	10	2	1	1	4
MECH04C	Stress Analysis	10	2	2		4
MECH05C	Computer Modelling and Analysis	10	1		3	4
MECH23C	Introduction to Thermodynamics	10	2	2	1	5
ELEC19C	Foundations of Electrical Engineering	10	2	2	2	6
MECH21C	Thermodynamics	10	2	2		4
MECH01I	Structure Mechanics	10	2	2		4
MECH03I	Kinematics of Mechanisms	10	2	2		4
MECH80I	Applied Numerical Methods	10	2	1	2	5
ELEC03I	Electric Machines and Control	10	2	2		4
MECH22C	Fluid Mechanics	10	2	2	2	6
MECH41C	Statistical Quality Control	10	2	1		3
MECH02I	Design of Machine Elements	10	2	2		4
MECH04I	Manufacturing Engineering (2)	10	2	1	1	4
MECH07I	Dynamics of Machinery	10	2	2		4
MECH60I	Materials Testing and Characterisation	10	2	2		4
MECH05I	Product Design and Material Selection	10	2	2		4
MECH06I	Machine Design	10	2	2		4
MECH20I	Heat and Mass Transfer	10	2	2		4
MECH80H	Mechanical Vibrations	10	2	2		4
MECH21I	Internal Combustion Engines	10	2	2		4
MECH81I	Mechatronics Systems	10	2		2	4
MECH42H	Operations Research	10	2	1		3
MECH43H	Automatic Control	10	2	2		4
MECHXXI	Elective (1)	10	2	2		4
MECHXXI	Elective (2)	10	2	2		4
MECH20H	Energy Conversion Systems	10	2	2		4
MECH44H	Production Planning and Control	10	2	1		3
Total		320	62	54	19	135

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool of Elective Courses						
MECH25I	Alternative Energy Systems	10	2	2		4
MECH41I	Plant Layout and Material Handling	10	2	2		4
MECH70I	Simulation Methods for Mechanical Engineering	10	1		2	3
MECH71I	Mechanics of Materials	10	2	2		4
MECH72I	Condition Monitoring of Machinery	10	2	2		4
MECH82I	Electronic Devices and Circuits	10	2	2		4
MECH85I	Robotics	10	1		3	4

Courses Required to achieve the Competencies of C-level (Programme Competencies for UK Requirements):

Courses Required to get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed:

Table 9 List of Discipline requirements courses (Mechanical Engineering)

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	University Requirements	50	8	10	2	20
	Faculty of Engineering Requirements	130	26	24	6	56
	Discipline Mechanical Requirements	320	62	54	19	135
University + Faculty + Discipline Requirements Total		500	96	88	27	211
	Programme Requirements					
MECH41H	Design and Analysis of Experiments	10	2	2		4
MECH60H	Advanced Materials and Manufacturing	10	2	2		4
MECH98H	Group Design Project	10	1	2		3
MECH99H	Individual Research Project	10	1	2		3
MECH98H	Group Design Project	10	1	2		3
MECH99H	Individual Research Project	10	1	2		3
MECHXXH	Elective (3)	10	2	2		4
MECHXXH	Elective (4)	10	2	2		4
MECHXXH	Elective (5)	10	2	2		4
MECHXXH	Elective (6)	10	2	2		4
Programme Requirements Total		100	16	20	0	36
Mechanical Programme Requirements Total		600	112	108	27	247

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool of Elective Courses						
MECH01H	Tool Design and Manufacture	10	1	2		3
MECH02H	Engineering Tribology	10	2	2	1	5
MECH04H	Reliability and Maintenance Engineering	10	2	1		3
MECH23H	Design of Vehicles	10	2	2		4
MECH25H	Computational Fluid Dynamics	10	1		2	3
MECH26H	Refrigeration and Air Conditioning	10	2	2		4
MECH27H	Fluid Machinery	10	2	2		4
MECH28H	Heat Transfer Equipment	10	2	2		4
MECH61H	Failure Analysis	10	2	2		4
MECH70H	Supply Chain Management	10	2	1		3
MECH71H	Simulation of Industrial Systems	10	2	1		3
MECH72H	Maintenance Management	10	2	1		3
MECH73H	Advanced Sheet Metal Forming	10	2	2		4
MECH74H	Analysis of Laminated Composite Materials	10	2	1		3
MECH75H	Design of Pressure Vessels and Piping	10	2	1		3
MECH76H	FEM for Engineering Applications	10	1		2	3
MECH77H	Industrial Process Control	10	2	2		4
MECH82H	Sensors and Instrumentation	10	2	2		4
MECH83H	Applied Microcontroller Programming	10	1		3	4
MECH84H	Artificial Intelligence for Engineering	10	1		2	3

10. Proposed Study Plan

To get a Bachelor of Science Degree in this programme, and to satisfy the Programme Competencies, the following set of courses need to be completed.

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Preparatory Year - Semester (1)						
SCIB01P	Mathematics for Engineers (1)	10	2	2	0	4
SCIB02P	Introductory Physics	10	2	1	2	5
MECH01P	Engineering Mechanics *	10	2	2	0	4
CHME01P	Chemistry for Engineers *	10	2	1	2	5
COMP01P	Introduction to Computing *	5	2	0	2	4
ENGENGL01	English and Academic Purposes	10	0	4	0	4
ENGG01P	Engineering Ethics and Human Rights *	5	2	0	0	2
Total		60	12	7	7	28

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Preparatory Year - Semester (2)						
SCIB03P	Mathematics for Engineers (2)	10	2	2	0	4
SCIB04P	Electricity and Magnetism	10	2	1	2	5
SCIB05P	Algebra and Geometry *	10	2	2	0	4
MECH02P	Engineering Drawing and Descriptive Geometry *	10	2	3	0	5
MECH03P	Production Technology I *	10	2	2	0	4
ENGENGL02	English and academic writing	10	0	4	0	4
Total		60	10	14	2	26

*** Modules that are taught to half the cohort in semester one and the other half in semester two.**

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY1 - Semester (1)					
MECH01C	Rigid Body Mechanics	10	2	2		4
MECH02C	Mechanical Graphics and Metrology	10	1	3		4
MECH20C	Introduction to Fluid Mechanics	10	2	2	1	5
MECH60C	Fundamentals of Materials Science and Engineering	10	2	2	2	6
SCIB01C	Calculus	10	2	2		4
SCIB04C	Modern Physics	10	2	1	2	5
	Total	60	11	12	5	28

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY1 - Semester (2)					
MECH03C	Manufacturing Engineering (1)	10	2	1	1	4
MECH04C	Stress Analysis	10	2	2		4
MECH05C	Computer Modelling and Analysis	10	1		3	4
MECH23C	Introduction to Thermodynamics	10	2	2	1	5
ELEC19C	Foundations of Electrical Engineering	10	2	2	2	6
SCIB02C	Differential Equations	10	2	2		4
	Total	60	11	9	7	27

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 - Semester (1)					
MECH21C	Thermodynamics	10	2	2		4
MECH40C	Project Management and Report Writing	10	2	1		3
MECH01I	Structure Mechanics	10	2	2		4
MECH03I	Kinematics of Mechanisms	10	2	2		4
MECH80I	Applied Numerical Methods	10	2	1	2	5
ELEC03I	Electric Machines and Control	10	2	2		4
	Total	60	12	10	2	24

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 - Semester (2)					
MECH22C	Fluid Mechanics	10	2	2	2	6
MECH41C	Statistical Quality Control	10	2	1		3
MECH02I	Design of Machine Elements	10	2	2		4
MECH04I	Manufacturing Engineering (2)	10	2	1	1	4
MECH07I	Dynamics of Machinery	10	2	2		4
MECH60I	Materials Testing and Characterisation	10	2	2		4
	Total	60	12	10	3	25

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY2 – Summer Semester					
ENGG03I	Industrial Training (1)	0	0	0	0	0

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY3 - Semester (1)					
MECH05I	Product Design and Material Selection	10	2	2		4
MECH06I	Machine Design	10	2	2		4
MECH20I	Heat and Mass Transfer	10	2	2		4
MECH40I	Engineering Economics	10	2	2		4
MECH40H	Industrial Safety and Environmental Engineering	10	2	1		3
MECH80H	Mechanical Vibrations	10	2	2		4
	Total	60	12	11	0	23

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY3 - Semester (2)					
MECH21I	Internal Combustion Engines	10	2	2		4
MECH81I	Mechatronics Systems	10	2		2	4
MECH42H	Operations Research	10	2	1		3
MECH43H	Automatic Control	10	2	2		4
MECHXXI	Elective (1)	10	2	2		4
MECHXXI	Elective (2)	10	2	2		4
	Total	60	12	9	2	23

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY3 – Summer Semester					
ENGG07H	Industrial Training (2)	0	0	0	0	0

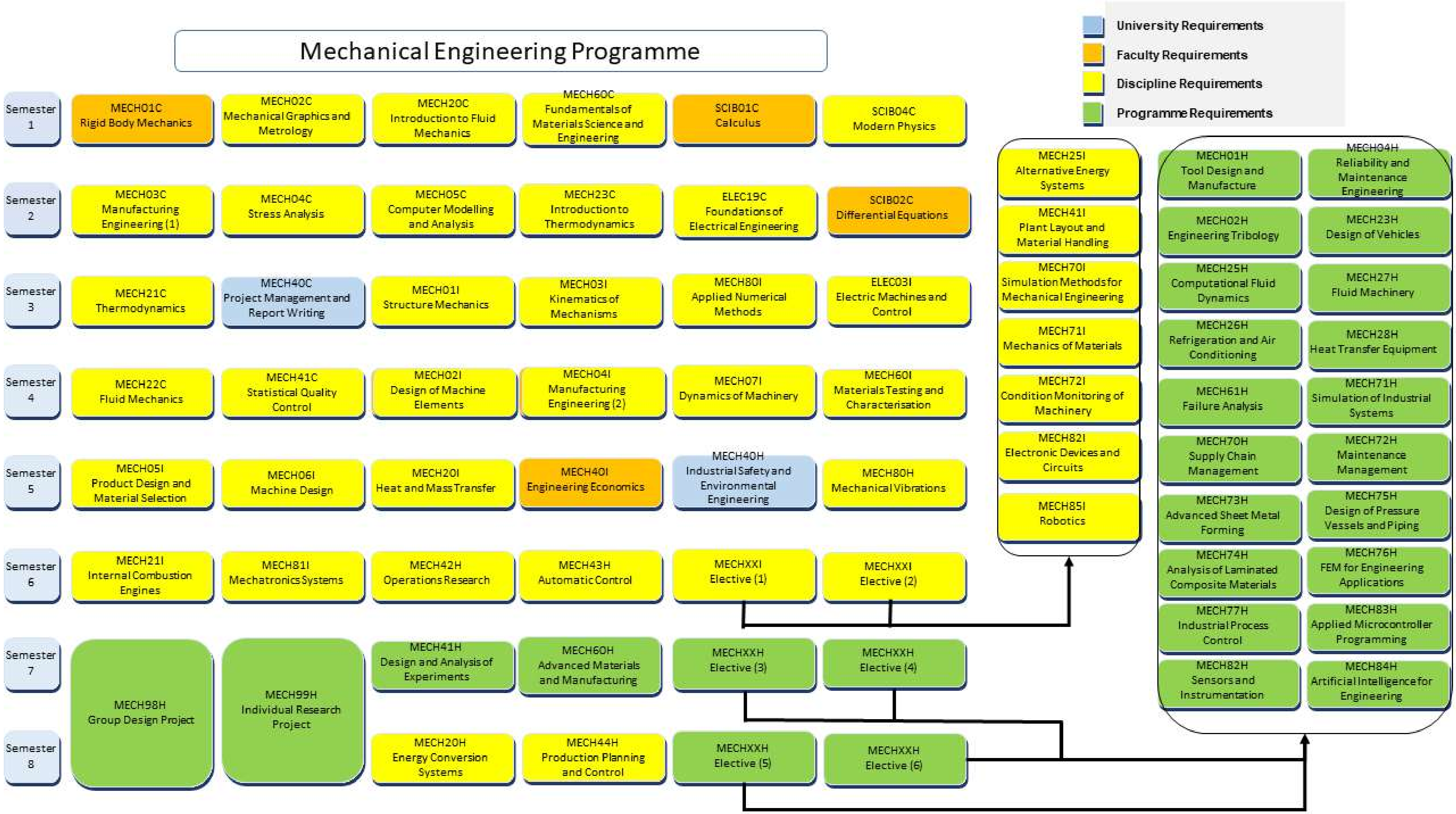
Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY4 - Semester (1)					
MECH41H	Design and Analysis of Experiments	10	2	2		4
MECH60H	Advanced Materials and Manufacturing	10	2	2		4
MECH98H	Group Design Project	10	1	2		3
MECH99H	Individual Research Project	10	1	2		3
MECHXXH	Elective (3)	10	2	2		4
MECHXXH	Elective (4)	10	2	2		4
	Total	60	10	12	0	22

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
	DY4 - Semester (2)					
MECH20H	Energy Conversion Systems	10	2	2		4
MECH44H	Production Planning and Control	10	2	1		3
MECH98H	Group Design Project	10	1	2		3
MECH99H	Individual Research Project	10	1	2		3
MECHXXH	Elective (5)	10	2	2		4
MECHXXH	Elective (6)	10	2	2		4
	Total	60	10	11	0	21

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 1 of Elective Courses						
	DY3 - Semester (2)					
MECH25I	Alternative Energy Systems	10	2	2		4
MECH41I	Plant Layout and Material Handling	10	2	2		4
MECH70I	Simulation Methods for Mechanical Engineering	10	1		2	3
MECH71I	Mechanics of Materials	10	2	2		4
MECH72I	Condition Monitoring of Machinery	10	2	2		4
MECH82I	Electronic Devices and Circuits	10	2	2		4
MECH85I	Robotics	10	1		3	4

Code	Course Title	Credits	Contact Hours			
		BUE	Lec	Tut	Lab	TT
Pool 2 of Elective Courses						
	DY4 - Semester (1)					
MECH01H	Tool Design and Manufacture	10	1	2		3
MECH02H	Engineering Tribology	10	2	2	1	5
MECH25H	Computational Fluid Dynamics	10	1		2	3
MECH26H	Refrigeration and Air Conditioning	10	2	2		4
MECH61H	Failure Analysis	10	2	2		4
MECH70H	Supply Chain Management	10	2	1		3
MECH73H	Advanced Sheet Metal Forming	10	2	2		4
MECH74H	Analysis of Laminated Composite Materials	10	2	1		3
MECH77H	Industrial Process Control	10	2	2		4
MECH82H	Sensors and Instrumentation	10	2	2		4
	DY4 - Semester (2)					
MECH04H	Reliability and Maintenance Engineering	10	2	1		3
MECH23H	Design of Vehicles	10	2	2		4
MECH27H	Fluid Machinery	10	2	2		4
MECH28H	Heat Transfer Equipment	10	2	2		4
MECH71H	Simulation of Industrial Systems	10	2	1		3
MECH72H	Maintenance Management	10	2	1		3
MECH75H	Design of Pressure Vessels and Piping	10	2	1		3
MECH76H	FEM for Engineering Applications	10	1		2	3
MECH83H	Applied Microcontroller Programming	10	1		3	4
MECH84H	Artificial Intelligence for Engineering	10	1		2	3

11. Programme Courses Tree



12. An Overview of Teaching, Learning and Assessment Strategies to Enable Competencies to be Achieved and Demonstrated

A. Learning and Teaching Methods

Throughout the programme students are encouraged to undertake independent reading both to supplement and consolidate what is being taught and to broaden, develop and reinforce their competencies throughout the programme. Targeted delivery may come from a variety of sources such as

1. Lectures.
2. Tutorials.
3. Problem solving classes.
4. Laboratory work
5. Project work undertaken both in groups and individually.
6. Studio Sessions.

Further support is gained through study skills delivered as a matter of policy within both the English language programme and individual modules.

13. Support for Learning

- All resources needed for the modules (Courses) are updated and uploaded on the E-Learning
- The tutorials are designed by the module leaders (course leader) to ensure a strong link with module contents to provide students with useful, challenging, good support & practice for the material discussed in lectures.
- Students are provided with feedback related to their submissions within two weeks of submissions.
- For assessed work, feedback is provided in the form of individual written feedback on coursework and as a discussion during tutorials.
- For developmental work, feedback is delivered in the form of dialogue between students and staff in tutorials as well as individual feedback provided in tutorials.
- Weaker students are supported with additional remedial classes and clinics during office hours to uplift their performance.
- A generic exam feedback is developed and posted on E-learning after releasing scripts to students each semester. Students will be notified via e-mail once generic feedback is uploaded.
- Institutional services including the Library, Welfare Counsellor, Faculty services including a Student Support Officer and Programme Handbook.

14. Assessment

Competencies are tested and assessed throughout the programme using a variety of forms that typically include a combination of

1. **Unseen written examinations**
2. Class tests
3. Coursework assignments
4. Lab work.
5. Design studios
6. Projects
7. Reports
8. Presentations

Coursework forms a particularly important part of the assessment. This method of assessment can

(i) be used to strongly motivate independent learning
(ii) improve student planning and time management skills and
(iii) to develop the comprehension and usage of technical English (particularly important for students at the BUE).

Examinations show how well the student can demonstrate their mastery of an area of scholarly knowledge by selecting appropriate material from memory and applying it to an unseen question in a limited time period. Coursework allows the student to demonstrate wider academic skill of focused scholarly research, drafting, editing and polished writing.

Applied skills are tested and assessed throughout the programme using a combination of coursework assignments, design studies, laboratory logbooks, project reports and/or papers, project logbooks and work placement reports.

15. Crisis and Disaster Management

The faculty of Engineering manages crisis and disaster through the following:

1. Crisis and Disaster Committee
2. Contingency Plan
3. Health and Safety
4. Contact Trees

16. Entry Requirements

In addition to the requirements listed in Part-B, students are required to successfully complete of the Engineering Preparatory Year and passing the entry exam which evaluates student's abilities and Mechanical skills.

Other admission routes may be considered in accordance with the University's regulations as defined in the Undergraduate Academic Regulations.

17. Quality Assurance and Programme Enhancement

- In accordance with the University's Quality Assurance procedures, as defined in the Annual Quality Assurance and Enhancement Cycle.
- Feedback on all aspects of this programme will be obtained via standard procedures from the University's framework for quality assurance, as defined in the Annual Quality and Enhancement Cycle.

18. Programme Management

- Head of Department
- Programme Director

The programme management is mainly carried out by the HoD. However, the main task of the PD is to monitor the sound delivery of the programme, and the maintenance of academic standards and quality, in line with the University's Strategic Plan for Teaching and Learning.

In addition to the previous, monthly Departmental meetings are carried out with all department's staff members. Related issues are raised for in-depth analysis and discussion to the FTLC that in turn raises with the UTLC and Senate for final decision.

19. Appendices

Appendix 1. Mapping matrix of Prog. Mission vs. Faculty Mission

Programme Mission	Faculty Mission	Mapping
to produce challenging Mechanical Engineers with high capability and skills which enable them to compete on the National and International levels. In addition, the department mission is to produce mechanical graduates having a solid foundation in mechanical engineering principles, good command in communication and problem solving abilities, and motivation and ability for lifelong growth in their professional career. The programme also aspires to encourage the development and maintaining of world-class research in selected focus areas within the engineering discipline which complements the educational mission and addresses the evolving needs of industry and society.	to provide a -1 broad spectrum of education and 2- research with a 3 British ethos, 4- working with UK and global partners to offer 5- internationally recognized quality degrees that enable 6- graduates to develop their knowledge and 7 entrepreneurship skills and to 8-contribute to the community development	The program's mission reflects the following three roles: **1. Educational role:** Graduating engineers with cognitive and professional skills that qualify them to compete at the local and regional levels to contribute to the advancement of the profession in the specialty of mechanical engineering within the framework of human and ethical values by producing graduates who have a solid foundation in the principles of mechanical engineering, good proficiency in communication and problem-solving capabilities, motivation, and the ability to grow to a great extent. life in their professional lives **In line with the faculty's mission** In providing a wide range of education and research and working with the UK and global partners to provide internationally recognized quality degrees that enable graduates to develop their knowledge and skills in entrepreneurship and contribute to the development of society. **2. Research role:** The commitment of the program's faculty members to producing distinguished applied and scientific research at the local and international levels to contribute to the development of society. By encouraging the development and maintenance of world-class research in selected areas within the engineering discipline that complements the educational mission and addresses the evolving needs of industry and society. **In line with the faculty's mission** Providing a wide range of education and research, working with UK and global partners to deliver internationally recognized quality degrees that

		enable graduates to develop their knowledge and skills in entrepreneurship and contribute to the development of society. **3. Community role:** The programme's faculty members are committed to providing community services **In line with the faculty's mission** Contributing to the development of society. And address the evolving needs of industry and society.

Appendix 2. Mapping matrix of Prog. Mission vs. Graduates Attributes

Programme Mission	Attributes of Engineering Graduate						
	Take a systematic approach and be logical and practical to address complex concepts	Deal with engineering problems through sustainable solutions and develop flexible strategies for creativity and innovation	Applying numerical, computational, analytical and technical skills at solving problems by using appropriate tools	Being aware of codes of conduct, and appreciating ethical, social, cultural, environmental, risk analysis, cost conscious, health and safety issues, and wider professional responsibilities	Awareness of the nature of business and enterprise in the creation of economic and social value	Grasp and understand the globalisation of engineering, commerce and communication	Acting in a professional manner, working effectively as part of teams, communicate effectively, and act responsibility and make sound management judgements
To produce challenging Mechanical Engineers with high capability and skills which enable them to compete on the National and International levels	√	√	√	√	√	√	√
To produce mechanical graduates having a solid foundation in mechanical engineering principles, good command in communication and problem solving abilities, and motivation and ability for lifelong growth in their professional career	√	√	√	√		√	√

Programme Mission	Attributes of Engineering Graduate						
	Take a systematic approach and be logical and practical to address complex concepts	Deal with engineering problems through sustainable solutions and develop flexible strategies for creativity and innovation	Applying numerical, computational, analytical and technical skills at solving problems by using appropriate tools	Being aware of codes of conduct, and appreciating ethical, social, cultural, environmental, risk analysis, cost conscious, health and safety issues, and wider professional responsibilities	Awareness of the nature of business and enterprise in the creation of economic and social value	Grasp and understand the globalisation of engineering, commerce and communication	Acting in a professional manner, working effectively as part of teams, communicate effectively, and act responsibility and make sound management judgements
To encourage the development and maintaining of world-class research in selected focus areas within the engineering discipline which complements the educational mission and addresses the evolving needs of industry and society					√	√	√

Appendix 3. Mapping matrix of Programme Mission to Programme Competencies

	Programme Mission	To produce challenging Mechanical Engineers with high capability and skills which enable them to compete on the National and International levels	To produce mechanical graduates having a solid foundation in mechanical engineering principles, good command in communication and problem solving abilities, and motivation and ability for lifelong growth in their professional career	To encourage the development and maintaining of world-class research in selected focus areas within the engineering discipline which complements the educational mission and addresses the evolving needs of industry and society
Programme Competencies	A1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics		√	
	A2 Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions		√	
	A3 Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development		√	
	A4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles		√	
	A5 Practice research techniques and methods of investigation as an inherent part of learning	√	√	√
	A6 Plan, supervise and monitor implementation of engineering projects	√	√	√
	A7 Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	√	√	√
	A8 Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	√	√	√
	A9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	√	√	√
	A10 Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	√	√	√

Programme Mission	To produce challenging Mechanical Engineers with high capability and skills which enable them to compete on the National and International levels	To produce mechanical graduates having a solid foundation in mechanical engineering principles, good command in communication and problem solving abilities, and motivation and ability for lifelong growth in their professional career	To encourage the development and maintaining of world-class research in selected focus areas within the engineering discipline which complements the educational mission and addresses the evolving needs of industry and society
B1 Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations	√	√	
B2 Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field	√	√	
B3 Select conventional mechanical equipment according to the required performance	√	√	
B4 Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to: design, build, operate, inspect and maintain mechanical equipment and systems	√	√	
C1 Use different instruments appropriately and carry-out experimental design, automatic data acquisition, data analysis, data reduction and interpretation, and data presentation, both orally and in the written form.	√	√	√
C2 Evaluate the sustainability and environmental issues related to mechanical power systems	√	√	√
C3 Use energy efficiently, operate and maintain energy systems	√	√	√
C4 Apply industrial safety	√	√	√
C5 Apply and integrate knowledge, understanding and skills of different subjects and available computer software to solve real problems m industries and power stations	√	√	√

Appendix 4. Mapping matrix of Programme Aims (Objectives) vs. Faculty Aims (Objectives)

Programme Aims (Objectives)	Faculty Aims (Objectives)
To offer an honours degree programme in the field of Mechanical Engineering. Not only does this programme seek to maintain full validation by a UK partner university but also to be fully accredited by Egyptian Supreme Council of Universities and possible UK professional bodies especially the MechE. It will provide engineering community (industry, academia, government, design offices) both within Egypt and internationally, with high quality graduates. These graduates will have a profile that includes a strong academic background in fundamental basic sciences, and mechanical engineering sciences, combined with the analytical, technical and professional skills necessary to operate successfully in the above-mentioned areas.	to provide a 1 **broad spectrum of education** and 2- **research** with a 3 **British ethos**, 4- **working with UK and global partners** to offer 5- **internationally recognized quality degrees** that enable 6- **graduates to develop their knowledge** and 7 **entrepreneurship skills** and to 8-**contribute to the community development**

Appendix 5. Mapping matrix of Programme Aims (Objectives) & Graduates Attributes

SERIAL	Programme Objectives	Attributes of Engineering Graduate (Mechanical Programme) according to NARS 2018									
		Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation	Behave professionally and adhere to engineering ethics and standards	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community	Value the importance of the environment, both physical and natural, and work to promote sustainability principles	Use techniques, skills and modern engineering tools necessary for engineering practice	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post-graduate and research studies	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner	Demonstrate leadership qualities, business administration and entrepreneurial skills
1	The ability to think creatively and with strong problem solving skills		√					√		√	
2	High level key and transferable skill sets	√			√	√				√	√

SERIAL	Programme Objectives	Attributes of Engineering Graduate (Mechanical Programme) according to NARS 2018									
		Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation	Behave professionally and adhere to engineering ethics and standards	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community	Value the importance of the environment, both physical and natural, and work to promote sustainability principles	Use techniques, skills and modern engineering tools necessary for engineering practice	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post-graduate and research studies	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner	Demonstrate leadership qualities, business administration and entrepreneurial skills
3	The ability to maintain independently a high level of professional and subject specific competence (often through CPD)	√							√		
4	Technical competence	√	√					√	√		
5	The ability to conceptualise problems at a high level	√									

SERIAL	Programme Objectives	Attributes of Engineering Graduate (Mechanical Programme) according to NARS 2018									
		Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation	Behave professionally and adhere to engineering ethics and standards	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community	Value the importance of the environment, both physical and natural, and work to promote sustainability principles	Use techniques, skills and modern engineering tools necessary for engineering practice	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post-graduate and research studies	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner	Demonstrate leadership qualities, business administration and entrepreneurial skills
6	Diligent and ethical working practices			√	√						
7	The ability to work both independently and as part of a team			√	√					√	√
8	Flexibility and the ability to apply their subject specific knowledge to fields outside their own	√			√	√	√			√	

SERIAL	Programme Objectives	Attributes of Engineering Graduate (Mechanical Programme) according to NARS 2018									
		Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation	Behave professionally and adhere to engineering ethics and standards	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community	Value the importance of the environment, both physical and natural, and work to promote sustainability principles	Use techniques, skills and modern engineering tools necessary for engineering practice	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post-graduate and research studies	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner	Demonstrate leadership qualities, business administration and entrepreneurial skills
9	The ability to face any new professional or academic challenge and use available resources to create innovative solutions		√	√		√				√	

Appendix 6. Mapping Matrix of Programme Aims (Objectives) vs Programme Competencies

	Programme Objectives	A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4	C 5
1	The ability to think creatively and with strong problem solving skills						√													√
2	High level key and transferable skill sets																	√	√	√
3	The ability to maintain independently a high level of professional and subject specific competence (often through CPD)					√		√	√	√		√								
4	Technical competence	√	√	√	√		√	√			√						√		√	
5	The ability to conceptualise problems at a high level			√	√		√			√	√		√							
6	Diligent and ethical working practices													√	√	√		√		
7	The ability to work both independently and as part of a team					√										√				
8	Flexibility and the ability to apply their subject specific knowledge to fields outside their own								√			√	√		√					
9	The ability to face any new professional or academic challenge and use available resources to create innovative solutions					√				√				√						

Appendix 7. Mapping matrix of Prog. Competencies vs. Graduate Attributes

	Attributes of Engineering Graduate	Take a systematic approach and be logical and practical to address complex concepts	Deal with engineering problems through sustainable solutions and develop flexible strategies for creativity and innovation	Applying numerical, computational, analytical and technical skills at solving problems by using appropriate tools	Being aware of codes of conduct, and appreciating ethical, social, cultural, environmental, risk analysis, cost conscious, health and safety issues, and wider professional responsibilities	Awareness of the nature of business and enterprise in the creation of economic and social value	Grasp and understand the globalisation of engineering, commerce and communication	acting in a professional manner, working effectively as part of teams, communicate effectively, and act responsibility and make sound management judgements
Programme Competencies	A1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	√						
	A2 Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions	√		√				
	A3 Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	√	√					
	A4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	√	√		√			
	A5 Practice research techniques and methods of investigation as an inherent part of learning	√	√					
	A6 Plan, supervise and monitor implementation of engineering projects							√

Attributes of Engineering Graduate	Take a systematic approach and be logical and practical to address complex concepts	Deal with engineering problems through sustainable solutions and develop flexible strategies for creativity and innovation	Applying numerical, computational, analytical and technical skills at solving problems by using appropriate tools	Being aware of codes of conduct, and appreciating ethical, social, cultural, environmental, risk analysis, cost conscious, health and safety issues, and wider professional responsibilities	Awareness of the nature of business and enterprise in the creation of economic and social value	Grasp and understand the globalisation of engineering, commerce and communication	acting in a professional manner, working effectively as part of teams, communicate effectively, and act responsibility and make sound management judgements
A7 Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams							√
A8 Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools							√
A9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations					√		
A10 Acquire and apply new knowledge, and practice self, lifelong and other learning strategies					√	√	
B1 Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations	√		√				
B2 Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field	√		√				
B3 Select conventional mechanical equipment according to the required performance	√	√					

Attributes of Engineering Graduate	Take a systematic approach and be logical and practical to address complex concepts	Deal with engineering problems through sustainable solutions and develop flexible strategies for creativity and innovation	Applying numerical, computational, analytical and technical skills at solving problems by using appropriate tools	Being aware of codes of conduct, and appreciating ethical, social, cultural, environmental, risk analysis, cost conscious, health and safety issues, and wider professional responsibilities	Awareness of the nature of business and enterprise in the creation of economic and social value	Grasp and understand the globalisation of engineering, commerce and communication	acting in a professional manner, working effectively as part of teams, communicate effectively, and act responsibility and make sound management judgements
B4 Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to: design, build, operate, inspect and maintain mechanical equipment and systems	√	√		√			
C1 Use different instruments appropriately and carry-out experimental design, automatic data acquisition, data analysis, data reduction and interpretation, and data presentation, both orally and in the written form.	√						
C2 Evaluate the sustainability and environmental issues related to mechanical power systems		√					
C3 Use energy efficiently, operate and maintain energy systems		√					
C4 Apply industrial safety		√		√			
C5 Apply and integrate knowledge, understanding and skills of different subjects and available computer software to solve real problems m industries and power stations			√				

Appendix 8. Mapping matrix of Courses vs. prog. Competencies (include Prep Year)

Semester	Modules		Programme Competences																		
	Title	**Code**	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**C5**
Prep Semester 1	Mathematics for Engineers (1)	22SCIB01P	Ö																		
	Introductory Physics	22SCIB02P	Ö	Ö									Ö					Ö	Ö		
	Engineering Mechanics *	22MECH01P	Ö											Ö							
	Chemistry for Engineers *	22CHME01P	Ö	Ö																	
	Introduction to Computing *	22COMP01P									Ö						Ö				Ö
	English and Academic Purposes	22ENGENGL01			Ö					Ö											
	Engineering Ethics and Human Rights *	22ENGG01P			Ö				Ö			Ö							Ö	Ö	
Prep Semester 2	Mathematics for Engineers (2)	22SCIB03P	Ö																		
	Electricity and Magnetism	22SCIB04P	Ö	Ö									Ö								
	Algebra and Geometry *	22SCIB05P	Ö																		
	Engineering Drawing and Descriptive Geometry *	22MECH02P								Ö				Ö		Ö	Ö				
	Production Technology I *	22MECH03P				Ö		Ö							Ö					Ö	
	English and academic writing	22ENGENGL02			Ö		Ö			Ö											
DY1 Semester 1	Rigid Body Mechanics	22MECH01C			Ö	Ö															
	Mechanical Graphics and Metrology	22MECH02C			Ö									Ö							
	Introduction to Fluid Mechanics	22MECH20C	Ö												Ö	Ö					
	Fundamentals of Materials Science and Engineering	22MECH60C	Ö												Ö	Ö					Ö
	Calculus	22SCIB01C			Ö																
	Modern Physics	22SCIB04C	Ö																		
DY1 Semester 2	Manufacturing Engineering (1)	22MECH03C		Ö												Ö	Ö		Ö		
	Stress Analysis	22MECH04C		Ö	Ö																
	Computer Modelling and Analysis	22MECH05C				Ö				Ö	Ö										

Semester	Modules		Programme Competences																		
	Title	Code	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2	C3	C4	C5
	Introduction to Thermodynamics	22MECH23C	Ö													Ö					
	Foundations of Electrical Engineering	22ELEC19C	Ö	Ö																	
	Differential Equations	22SCIB02C			Ö																
DY2 Semester 3	Thermodynamics	22MECH21C	Ö		Ö				Ö						Ö						
	Project Management and Report Writing	22MECH40C											Ö								Ö
	Structure Mechanics	22MECH01I		Ö		Ö															
	Kinematics of Mechanisms	22MECH03I		Ö		Ö									Ö						
	Applied Numerical Methods	22MECH80I	Ö		Ö					Ö											
	Electric Machines and Control	22ELEC03I		Ö				Ö													
DY2 Semester 4	Fluid Mechanics	22MECH22C	Ö		Ö				Ö						Ö						
	Statistical Quality Control	22MECH41C					Ö				Ö	Ö		Ö							
	Design of Machine Elements	22MECH02I						Ö			Ö										
	Manufacturing Engineering (2)	22MECH04I		Ö												Ö	Ö		Ö		
	Dynamics of Machinery	22MECH07I		Ö								Ö					Ö				
	Materials Testing and Characterisation	22MECH60I									Ö						Ö				
DY3 Semester 5	Product Design and Material Selection	22MECH05I				Ö				Ö	Ö	Ö			Ö			Ö			Ö
	Machine Design	22MECH06I			Ö	Ö			Ö												
	Heat and Mass Transfer	22MECH20I								Ö					Ö		Ö				
	Engineering Economics	22MECH40I											Ö					Ö			
	Industrial Safety and Environmental Engineering	22MECH40H					Ö								Ö	Ö					
	Mechanical Vibrations	22MECH80H							Ö			Ö			Ö						
DY3 Semester 6	Internal Combustion Engines	22MECH21I				Ö			Ö			Ö			Ö						
	Mechatronics Systems	22MECH81I	Ö						Ö		Ö						Ö				
	Operations Research	22MECH42H			Ö				Ö			Ö	Ö				Ö				
	Automatic Control	22MECH43H							Ö			Ö					Ö				

Semester	Modules		Programme Competences																		
	Title	Code	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2	C3	C4	C5
DY3 Semester 6 Optional Modules	Alternative Energy Systems	22MECH25I								Ö	Ö										
	Plant Layout and Material Handling	22MECH41I									Ö										
	Simulation Methods for Mechanical Engineering	22MECH70I							Ö	Ö	Ö										Ö
	Mechanics of Materials	22MECH71I									Ö	Ö									
	Condition Monitoring of Machinery	22MECH72I									Ö						Ö				
	Electronic Devices and Circuits	22MECH82I						Ö			Ö										
	Robotics	22MECH85I						Ö	Ö	Ö	Ö										
DY4 Semester 7	Design and Analysis of Experiments	22MECH41H							Ö			Ö									Ö
	Advanced Materials and Manufacturing	22MECH60H									Ö	Ö									
DY4 Semester 8	Energy Conversion Systems	22MECH20H								Ö	Ö	Ö			Ö						
	Production Planning and Control	22MECH44H										Ö					Ö	Ö			
DY4 Year Long Modules	Group Design Project	MECH98H					Ö		Ö					Ö					Ö	Ö	
	Individual Research Project	MECH99H					Ö		Ö					Ö					Ö	Ö	
DY4 Optional Modules	Tool Design and Manufacture	22MECH01H								Ö	Ö						Ö				Ö
	Engineering Tribology	22MECH02H										Ö				Ö	Ö				
	Reliability and Maintenance Engineering	22MECH04H							Ö			Ö			Ö						
	Design of Vehicles	22MECH23H						Ö		Ö	Ö						Ö				
	Computational Fluid Dynamics	22MECH25H			Ö			Ö		Ö	Ö				Ö						Ö
	Refrigeration and Air Conditioning	22MECH26H										Ö					Ö				Ö
	Fluid Machinery	22MECH27H								Ö	Ö										
	Heat Transfer Equipment	22MECH28H								Ö	Ö					Ö	Ö				
	Failure Analysis	22MECH61H										Ö					Ö				Ö
	Supply Chain Management	22MECH70H																Ö			
	Simulation of Industrial Systems	22MECH71H						Ö		Ö								Ö			
	Maintenance Management	22MECH72H										Ö									

Semester	Modules		Programme Competences																		
	Title	Code	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2	C3	C4	C5
	Advanced Sheet Metal Forming	22MECH73H								Ö				Ö			Ö				
	Analysis of Laminated Composite Materials	22MECH74H															Ö				Ö
	Design of Pressure Vessels and Piping	22MECH75H			Ö												Ö				
	FEM for Engineering Applications	22MECH76H			Ö			Ö		Ö											
	Industrial Process Control	22MECH77H							Ö												
	Sensors and Instrumentation	22MECH82H			Ö							Ö				Ö					
	Applied Microcontroller Programming	22MECH83H			Ö			Ö			Ö										Ö
	Artificial Intelligence for Engineering	22MECH84H			Ö			Ö									Ö				Ö

Appendix 9. Teaching and Learning methods vs. Programme Competencies

	Programme Learning Competences/Outcomes (Prog. LOs) الكفاءات/الجدارات	Teaching and Learning Methods					
		Interactive Lectures	Research	Collaborating Learning (Team Project)	Tutorials	Self Study	Labs/ Workshops
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	√			√		
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions			√		√	
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	√			√		√
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles		√	√			
A5	Practice research techniques and methods of investigation as an inherent part of learning			√			√
A6	Plan, supervise and monitor implementation of engineering projects			√		√	√
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	√	√	√	√		
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools				√	√	

	Programme Learning Competences/Outcomes (Prog. LOs) الكفاءات/الجدارات	Teaching and Learning Methods					
		Interactive Lectures	Research	Collaborating Learning (Team Project)	Tutorials	Self Study	Labs/ Workshops
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations		√	√			
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies		√				√
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations	√			√	√	
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field		√	√			
B3	Select conventional mechanical equipment according to the required performance	√		√			√
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to: design, build, operate, inspect and maintain mechanical equipment and systems		√	√			
C1	Use different instruments appropriately and carry-out experimental design, automatic data acquisition, data analysis, data reduction and interpretation, and data presentation, both orally and in the written form						√
C2	Evaluate the sustainability and environmental issues related to mechanical power systems		√	√		√	
C3	Use energy efficiently, operate and maintain energy systems	√		√			√

	Programme Learning Competences/Outcomes (Prog. LOs) الكفاءات/الجدارات	Teaching and Learning Methods					
		Interactive Lectures	Research	Collaborating Learning (Team Project)	Tutorials	Self Study	Labs/ Workshops
C4	Apply industrial safety	√				√	
C5	Apply and integrate knowledge, understanding and skills of different subjects and available computer software to solve real problems m industries and power stations			√		√	

Appendix 10. Assessment methods vs Programme Competencies

Assessment Methods	Programme LOs																		
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	C1	C2	C3	C4	C5
Laboratory Write-up			√		√	√				√			√		√		√		√
Report				√			√		√			√				√		√	
Presentation		√		√			√						√	√					
In-class or online Assessment	√							√			√								√
Project					√	√								√		√	√		√
Take home Assignment		√				√		√			√					√		√	
In-class	√		√				√				√								
Unseen Final Exam	√		√				√				√								√

Appendix 11. Mapping Matrix of programme competencies vs. QAA Benchmarks Statements

#	Programme Competencies	UK QAA - Benchmark Statements
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	A1 Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology. Strive to extend own technological capability B1 Identify potential projects and opportunities. Establish and help develop solutions to meet users' requirements Enhance engineering practices, products, processes, systems and services B3 Manage implementation of design solutions, and evaluate their effectiveness. Ensure that the application of the design results in the appropriate practical outcome Implement design solutions, taking account of critical constraints, including due concern for safety and sustainability Determine the criteria for evaluating the design solutions A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems. Promote new applications when appropriate
A2	Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions	B3 Manage implementation of design solutions, and evaluate their effectiveness. Ensure that the application of the design results in the appropriate practical outcome Implement design solutions, taking account of critical constraints, including due concern for safety and sustainability Determine the criteria for evaluating the design solutions Evaluate the outcome against the original specification Actively learn from feedback on results to improve future design solutions and build best practice.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems. Assess market needs and contribute to marketing strategies Identify constraints and exploit opportunities for the development and transfer of technology within own chosen field Promote new applications when appropriate Secure the necessary intellectual property (IP) rights Develop and evaluate continuous improvement systems. B1 Identify potential projects and opportunities. Establish and help develop solutions to meet users'

#	Programme Competencies	UK QAA - Benchmark Statements
		requirements Consider and implement new and emerging technologies Enhance engineering practices, products, processes, systems and services B2 Conduct appropriate research, and undertake design and development of engineering solutions. Collect, analyse and evaluate the relevant data E3 Undertake engineering activities in a way that contributes to sustainable development. Operate and act responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously Use imagination, creativity and innovation to provide products and services which maintain and enhance the quality of the environment and community, and meet financial objectives Understand and secure stakeholder involvement in sustainable development E2 Manage and apply safe systems of work. Identify and take responsibility for own obligations for health, safety and welfare issues Ensure that systems satisfy health, safety and welfare requirements Develop and implement appropriate hazard identification and risk management systems and culture Manage, evaluate and improve these systems B3 Manage implementation of design solutions, and evaluate their effectiveness. Ensure that the application of the design results in the appropriate practical outcome Implement design solutions, taking account of critical constraints, including due concern for safety and sustainability Determine the criteria for evaluating the design solutions Evaluate the outcome against the original specification Actively learn E1 Comply with relevant codes of conduct. Comply with the rules of professional conduct of own institution Lead work within all relevant legislation and regulatory frameworks, including social and employment legislation.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	A2Secure the necessary intellectual property (IP) rights E2 Manage and apply safe systems of work. Identify and take responsibility for own obligations for health, safety and welfare issues Ensure that systems satisfy health, safety and welfare requirements

#	Programme Competencies	UK QAA - Benchmark Statements
		Develop and implement appropriate hazard identification and risk management systems and culture Manage, evaluate and improve these systems Apply a sound knowledge of health and safety legislation. E5 Exercise responsibilities in an ethical manner. A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems. Identify constraints and exploit opportunities for the development and transfer of technology within own chosen field E3 Undertake engineering activities in a way that contributes to sustainable development. Operate and act responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously Use imagination, creativity and innovation to provide products and services which maintain and enhance the quality of the environment and community, and meet financial objectives Understand and secure stakeholder involvement in sustainable development B2 Conduct appropriate research, and undertake design and development of engineering solutions. Allocate and manage resources Prepare, present and agree design recommendations, with appropriate analysis of risk, and taking account of cost, quality, safety, reliability, appearance, fitness for purpose, security, intellectual property (IP) constraints and opportunities, and environmental impact.
A5	Practice research techniques and methods of investigation as an inherent part of learning	B1 Identify potential projects and opportunities. Establish and help develop solutions to meet users' requirements Consider and implement new and emerging technologies Enhance engineering practices, products, processes, systems and services B2 Conduct appropriate research, and undertake design and development of engineering solutions. Collect, analyse and evaluate the relevant data B3 Manage implementation of design solutions, and evaluate their effectiveness. Determine the criteria for evaluating the design solutions Evaluate the outcome against the original specification

#	Programme Competencies	UK QAA - Benchmark Statements
A6	Plan, supervise and monitor implementation of engineering projects	A1 Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology. A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems. Promote new applications when appropriate B3 Manage implementation of design solutions, and evaluate their effectiveness. Ensure that the application of the design results in the appropriate practical outcome Determine the criteria for evaluating the design solutions Evaluate the outcome against the original specification Actively learn from feedback on results to improve future design solutions and build best E3 Undertake engineering activities in a way that contributes to sustainable development. Operate and act responsibly, taking account of the need to progress environmental social and economic outcomes simultaneously Use imagination, creativity and innovation to provide products and services which maintain and enhance the quality of the environment and community, and meet financial objectives Use resources efficiently and effectively. E4 Carry out and record CPD necessary to maintain and enhance competence in own area of practice including: Undertake reviews of own development needs Plan how to meet personal and organisational objectives Carry out planned (and unplanned) CPD activities Maintain evidence of competence development Evaluate CPD outcomes against any plans made Assist others with their own CPD. C2 Plan, budget, organise, direct and control tasks, people and resources. Set up appropriate management systems Define quality standards, programme and budget within legal and statutory requirements Organise and lead work teams, coordinating project activities Ensure that variations from quality standards, programme and budgets are identified, and that corrective action is taken Gather and evaluate feedback, and recommend improvements. C1 Plan for effective project implementation. Systematically review the factors affecting the project implementation including safety and sustainability considerations.

#	Programme Competencies	UK QAA - Benchmark Statements
		Ensure that the necessary resources are secured and brief the project team C4Bring about continuous improvement through quality management. Promote quality throughout the organisation and its customer and supplier networks Develop and maintain operations to meet quality standards Direct project evaluation and propose recommendations for improvement.
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams	C3 Lead teams and develop staff to meet changing technical and managerial needs. Agree objectives and work plans with teams and individuals Identify team and individual needs, and plan for their development Reinforce team commitment to professional standards Lead and support team and individual development Assess team and individual performance, and provide feedback.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	D1 Communicate in English with others at all levels. Lead, chair, contribute to and record meetings and discussions Prepare communications, documents and reports on complex matters Exchange information and provide advice to technical and non-technical colleagues.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems. Secure the necessary intellectual property (IP) rights E1 Comply with relevant codes of conduct. Comply with the rules of professional conduct of own institution Lead work within all relevant legislation and regulatory frameworks, including social and employment legislation. B2 Conduct appropriate research, and undertake design and development of engineering solutions. Identify and agree appropriate research methodologies Allocate and manage resources Develop the necessary tests Collect, analyse and evaluate the relevant data Undertake engineering design Prepare, present and agree design recommendations, with appropriate analysis of risk, and taking account of cost, quality, safety, reliability, appearance, fitness for purpose, security,

#	Programme Competencies	UK QAA - Benchmark Statements
		intellectual property (IP) constraints and opportunities, and environmental impact.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems. Secure the necessary intellectual property (IP) rights E1 Comply with relevant codes of conduct. Comply with the rules of professional conduct of own institution Lead work within all relevant legislation and regulatory frameworks, including social and employment legislation. B2 Conduct appropriate research, and undertake design and development of engineering solutions. Identify and agree appropriate research methodologies Allocate and manage resources Develop the necessary tests Collect, analyse and evaluate the relevant data Undertake engineering design Prepare, present and agree design recommendations, with appropriate analysis of risk, and taking account of cost, quality, safety, reliability, appearance, fitness for purpose, security, intellectual property (IP) constraints and opportunities, and environmental impact.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations	B2 Conduct appropriate research, and undertake design and development of engineering solutions. Collect, analyse and evaluate the relevant data E3 Undertake engineering activities in a way that contributes to sustainable development. Operate and act responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously Use imagination, creativity and innovation to provide products and services which maintain and enhance the quality of the environment and community, and meet financial objectives Understand and secure stakeholder involvement in sustainable development B3 Manage implementation of design solutions, and evaluate their effectiveness. Ensure that the application of the design results in the appropriate practical outcome Implement design solutions, taking account of critical constraints, including due concern for safety and sustainability Determine the criteria for evaluating the design solutions Evaluate the outcome against the original specification

#	Programme Competencies	UK QAA - Benchmark Statements
		Actively learn A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems. Assess market needs and contribute to marketing strategies Identify constraints and exploit opportunities for the development and transfer of technology within own chosen field Promote new applications when appropriate Secure the necessary intellectual property (IP) rights Develop and evaluate continuous improvement systems.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field	A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems. Assess market needs and contribute to marketing strategies Identify constraints and exploit opportunities for the development and transfer of technology within own chosen field Promote new applications when appropriate Secure the necessary intellectual property (IP) rights Develop and evaluate continuous improvement systems.
B3	Select conventional mechanical equipment according to the required performance	B3 Manage implementation of design solutions, and evaluate their effectiveness. Ensure that the application of the design results in the appropriate practical outcome Determine the criteria for evaluating the design solutions Evaluate the outcome against the original specification Actively learn from feedback on results to improve future design solutions and build best
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to: design, build, operate, inspect and maintain mechanical equipment and systems	E1 Comply with relevant codes of conduct. Comply with the rules of professional conduct of own institution Lead work within all relevant legislation and regulatory frameworks, including social and employment legislation.
C1	Use different instruments appropriately and carry-out experimental design, automatic data acquisition, data analysis, data reduction and interpretation, and data presentation, both orally and in the written form.	B2 Conduct appropriate research, and undertake design and development of engineering solutions. Identify and agree appropriate research methodologies Allocate and manage resources Develop the necessary tests Collect, analyse and evaluate the relevant data Undertake engineering design

#	Programme Competencies	UK QAA - Benchmark Statements
C2	Evaluate the sustainability and environmental issues related to mechanical power systems	E3 Undertake engineering activities in a way that contributes to sustainable development. Operate and act responsibly, taking account of the need to progress environmental social and economic outcomes simultaneously Use imagination, creativity and innovation to provide products and services which maintain and enhance the quality of the environment and community, and meet financial objectives Use resources efficiently and effectively.
C3	Use energy efficiently, operate and maintain energy systems	A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems. • Develop and evaluate continuous improvement systems.
C4	Apply industrial safety	E2 Manage and apply safe systems of work. Identify and take responsibility for own obligations for health, safety and welfare issues Ensure that systems satisfy health, safety and welfare requirements Develop and implement appropriate hazard identification and risk management systems and culture Manage, evaluate and improve these systems Apply a sound knowledge of health and safety legislation.
C5	Apply and integrate knowledge, understanding and skills of different subjects and available computer software to solve real problems m industries and power stations	B2 Conduct appropriate research, and undertake design and development of engineering solutions. Collect, analyse and evaluate the relevant data B3 Manage implementation of design solutions, and evaluate their effectiveness. Determine the criteria for evaluating the design solutions Evaluate the outcome against the original specification