## Engineering Probability and Statistics

<table>
<thead>
<tr>
<th>Module Title</th>
<th>Engineering Probability and Statistics</th>
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</thead>
<tbody>
<tr>
<td>Level</td>
<td>4</td>
</tr>
<tr>
<td>Reference No. (showing level)</td>
<td>EAX_4_266/ENGG04C01</td>
</tr>
<tr>
<td>Credit Value</td>
<td>10 credit points</td>
</tr>
<tr>
<td>Student Study Hours</td>
<td>Contact hours: 22 lectures + 11 Tutors</td>
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<td></td>
<td>Student managed learning hours: 100</td>
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<tr>
<td>Pre-requisite learning</td>
<td>-</td>
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<tr>
<td>Co-requisites</td>
<td>-</td>
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<tr>
<td>Excluded combinations</td>
<td>-</td>
</tr>
<tr>
<td>Module co-ordinator (Name + Email)</td>
<td>Gamal.Nashed</td>
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<tr>
<td>Faculty/Department</td>
<td>Engineering/Petroleum Engineering</td>
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<tr>
<td>Short Description</td>
<td>Statistics, Probability</td>
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<tr>
<td>Aims</td>
<td>The aim of this module is to provide necessary mathematical foundation in probability and statistics for engineers.</td>
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### Learning Outcomes

#### Knowledge and Understanding:
On completion of this module students should be able to demonstrate knowledge and understanding of:
1. Probability, random variables;
2. Sampling distributions, confidence intervals, significance levels;

#### Intellectual Skills:
On completion of this module students should be able to demonstrate ability in:
3. Calculate probabilities, the expected value and variance of a random variable;
4. Model problems using known random variables;
5. Make inferences on the population using a sample;

#### Practical Skills:
On completion of this module students should be able to demonstrate ability in:
6. Analyse real world data and present the information in a meaningful form using an appropriate software package;
7. Apply probability and statistical analysis in calculating eng problem accuracy

#### Transferable Skills:
On completion of this module students should be able to demonstrate ability in:
8. Plan group projects including allocating tasks; work effectively in a team to meet predetermined deadlines.
9. Having statistical analysis ability for quality control.

### Employability
To prepare student to get job and be professional graduate in future, the development of one or more of top engineering skills, namely problem solving, communication, management and
environment and economics, is addressed in this module. Personal development planning is also one of our focuses in this module.

| Teaching and learning pattern | 1. 22, 1h Lectures. This method informs learning outcomes 1, 2, 3, 4, 5.  
2. 11, 1h tutorials. This method informs learning outcomes 3, 4, 5, 6, 7, 8, 9. |
| Indicative content | Elements of probability, conditional probability, discrete and continuous random variables, discrete and continuous distribution, jointly distributed random variables, descriptive statistics, parameter estimation, interval estimates, hypothesis testing. |
| Assessment Elements & weightings |  
- **Examination**: A 180 minute unseen written examination. Assesses learning outcomes 1, 2, 3, 4, 5.  
- **Course work**: 15% A group project (4 to 6 students) assesses learning outcomes 6, 7, 8, 9 and 15% in-class test assesses learning outcomes 1, 3, 4.  
- Students must achieve (i) 40% for the total module mark and (ii) at least 30% in the unseen examination and the course work in order to achieve an overall passing mark for this module. |
| Indicative Sources (Reading lists) |  