

Compulsory modules:

Module Code	Module Title
CSM 601	Web Modelling
SEM 601	Service Oriented Software Engineering
ISM 601	Introduction to Web Science
CNM 601	Web Topologies

Thesis module:

Module Code	Module Title
WST 701	Research Project (MSc)

Optional/Elective modules:

Module Code	Module Title
CSM 602	Web Languages and Technologies
CSM 603	Software Agents
CSM 604	Parallel and Distributed Systems
SEM 602	Social networks
SEM 603	Software Engineering for Web Applications
SEM 604	Interacting in Virtual Environments
ISM 602	Information Theory and Processing
ISM 603	Web Mining and Information Retrieval
ISM 604	Knowledge Processing in the Web
CNM 602	Emerging Computer Networks
CNM 603	Net-centric Computing
CNM 604	Network monitoring, visualization, characterization, and analysis

The external reference points for the programme are:

- Supreme Council of Universities (Egypt).
- QAA (UK) – The QAA “Subject Benchmark Statement Computing” March 2022; includes postgraduate taught master’s degrees, sections 4.7 to 4.14.
- NAAQAE (Egypt) – the National Authority for Quality Assurance and Accreditation of Education (NARS Statements for post graduate studies: 2010).

Module Descriptions:

Compulsory Modules

<p>Introduction to Web Science</p>	<p>Starting with a brief history on Web Science, we outline a comprehensive set of research questions according to the Web Science Trust, illustrating the complex and multifaceted nature of the Web, and the multidisciplinary nature of its study and development. These questions, disciplines, and approaches together set out an agenda for Web Science. We survey central engineering issues, such as web architecture, the development of the Semantic Web, Web Services and so on. Beside law, and design we consider the Web as a technology, which is essentially socially embedded; therefore, we review various issues and requirements for Web use.</p>
<p>Service Oriented Software Engineering</p>	<p>Service-Oriented Architecture (SOA) is a model and set of standards that support the development and deployment of loosely coupled distributed software systems. This module introduces concepts, technologies, and the array of standards available based on this approach, and the use of these to engineer software based on this paradigm. Web Service (WS): the widely implemented model and standard of SOA provides a platform-independent method for messaging-based interaction of applications. Students will be expected to demonstrate both theoretical and practical skills in the topics introduced and how to apply them in real life.</p>
<p>Web Modelling</p>	<p>This course is intended for students with a general science and computer science background and makes them well equipped to proceed to become the ideal choice for the best employers in internet-related industries and the areas requiring big data analytical skills.</p>
<p>Web Topologies</p>	<p>Starting with a brief introduction to the graph theory, we outline a comprehensive set of research questions that are related to why we should care to study web topology, illustrating the complex and multifaceted nature of the Web graphs, graph theory, and the</p>

	<p>multidisciplinary nature of its study and development. These questions, disciplines and approaches together set out an agenda for Web topology. We deeply study and analyse the central engineering issues, such as graph theory, graph representation, graph searching and traversing algorithms</p>
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Thesis Module

Research Thesis	<p>This module is designed to provide students with the skills of finding a solution to a specific scientific problem through a research methodology, MSc research thesis.</p>
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Optional/Elective Modules

Emerging Computer Networks	<p>In this module, new emerging topics in computer networks are presented and discussed. The module will provide students with significant knowledge about topics such as software-defined networking (SDN) paradigm that is changing the way networks are managed, maintained and secured; mobile cloud computing and future internet architecture</p>
Information Theory and Processing	<p>An overview of Shannon's Information Theory and how it relates to the fundamental issues of data compression and quantization algorithms, communication channels, and error detection and correction algorithms.</p>
Interacting in Virtual Environments	<p>This course will enable the student to develop the practical and theoretical knowledge and ability necessary to design, execute and evaluate virtual environments in the context of digital games, interactive entertainment and simulation. Emphasis is placed on the development of practical, real-world skills and analytical understanding,</p>
Knowledge Processing in the Web	<p>The module introduces the main concepts of knowledge representation and processing on the web. This includes fundamental aspects of web related technologies and more recent concepts for Semantic Web architecture, technologies, security and applications. This in addition to the Internet future trends and structures.</p>
Net-centric Computing	<p>This course focuses on Cloud Computing which is a vastly growing technology in the recent years. In 2012, it was found that 64 per cent of companies were using cloud-based systems in some form</p>

	but, despite this industry need and the fact that people are using cloud based applications on a daily basis. This course equips you with the knowledge and understanding to contribute to this quickly changing and developing area.
Network monitoring, visualization, characterization, and analysis	The module introduces the concepts of network monitoring, visualization, characterization and analysis. This includes understanding fundamentals of managing networks, the different tools and protocols used. Remote network monitoring will also be presented. Network visualization will be also focused on, and the ability to analyse and characterize a network, and the tools that can be used to achieve this. Students will be expected to demonstrate both theoretical and practical skills in the topics introduced and how to apply them in real life.
Parallel & Distributed Systems	This module focuses on the principles of parallel and distributed systems and the implementation and performance issues associated with them. We will examine programming models/interfaces to parallel and distributed computing, interprocess communication, synchronization and consistency models, fault tolerance and reliability, distributed process management, parallel machine architectures, parallel program optimization, and the interaction of the compiler, run-time, and machine architecture.
Social Networks	The course covers the modelling, design, implementation and characterization of web based and peer-to-peer based social networking.
Software Agents	The module begins with an overview of the agent systems and software agents. Then we focus on agent system architecture and infrastructure from a software engineering viewpoint, including: <ul style="list-style-type: none"> • Requirements for agent-based systems • Modeling and design of agent-based systems • Development process for agent-based systems Topics such as agent architecture, communication, knowledge sharing, computing and uncertainty management are discussed. Studying society of agents and models of agency follows. Finally, a perspective on a methodology for agent-oriented software engineering and standards are presented.
Software Engineering for Web Applications	The aim of the module is to familiarise students with the principles and software engineering issues associated with the development of web-based applications and services.

Web Languages and Technologies	This module delivers to the graduate students the XML-based languages and different recent client-side and server-side web technologies.
Web Mining and Information Retrieval	This module delivers to the graduate students a briefing on data mining and information technology sciences. Then show the application of these sciences on the mining of the contents, structure and usage of the web technology.