



# ACADEMIC PROGRAMS GUIDE

## دليل البرامج الأكاديمية

تم مراجعته بواسطة لجنة تطوير البرامج التعليمية بوحدة  
ضمان الجودة بالكلية.



إصدار سبتمبر ٢٠٢١

## Academic Plan

The minimum number of credit hours required for obtaining the Bachelor of Science Degree (B.Sc.) is **144** credit hours in no less than seven semesters and maximum of eight years.

A final written examination is held for each course at the end of the semester. A student must obtain at least 30% of the final written exam to pass the course.

Only Student who transferred to level three can select and register his program's elective courses (subject to Academic Advisor Approval and the requirements of his/her program).

A student may study one elective course from another Program's Elective courses (subject to Academic Advisor Approval and the requirements of his program).

New, state-of-the-art, courses can be added to its master elective pool of each program upon the approval of the Department/Faculty councils.

**Table 8:** Indicative curricula contents by subject area according to NARS 2018

	Subject Area	Credits	Program(s) %	NARS Tolerance %
1	Humanities, ethical and Social Science	14	9.60	8-10
2	Mathematics and Basic Science	25	17.36	16-18
3	Basic Computing Science	47	32.64	26-28
4	Applied Computing Science	52	36.11	28-30
5	Training (zero credit – graduation requirement)	0	0	3-5
6	Graduation Project	6	4.29	3-5
7	Optional (Institution character-identifying subjects)	0	0	16-4
	Total	144		100%

### Article (34): Programs' Academic Reference Standards

The academic standards invoked in programs specifications are driven based on the \*National Academic Reference Standards (NARS) for "Computing" approved by the National Authority of Quality Assurance and Accreditation of Education in October 2010.

### Structure of the Program(s):

The faculty applies the Credit Hour System which is based on the credit units. Students should complete 48 modules, total of 144 credit hours, summarized as follows:

- 8 modules (University Requirements) (14 credit hours) (9.60 %)
- 11 modules (Faculty Requirements) (31 credit hours) (21.53 %)
- 25 modules (Departmental Compulsory) (87 credit hours) (60.42 %)
- 4 modules (Departmental Electives) (12 credit hours) (8.33 %)

## **University Requirements – Liberal Arts Courses**

The study of liberal arts is one of the main distinct features of October 6 University (O6U) undergraduate programs that makes such programs different from all other programs offered by other universities.

The focus of O6U liberal arts requirements is on:

- Creativity and decision making by allowing freedom of thinking.
- Logical and critical thinking.
- Multidisciplinary and synthesizing.
- Promotion of diversity by learning various ways of explaining ideas and phenomena.
- Soft skills including leadership qualities.

The pedagogy used includes:

- Students centered by maintaining small size classes.
- Active learning through group work, discussions, projects, and problem solving.
- Reflection of one's learning.
- Allowing students to interact with others beyond their major.

These requirements are specified to help building the knowledge and skills needed for a modern society.

The aims of the liberal arts courses are to help individuals for:

- 1- Preparing domestic citizenship and free-thinking personnel.
- 2- Character building
- 3- Fostering ambition to use their specialized knowledge in the real world with transferable skills.
- 4- Exposing to broad fields such as humanities, social sciences, and natural sciences to inculcate in multidisciplinary thinking.
- 5- Stimulating and satisfying the intellectual curiosity.

- 6- Developing the ability to identify creative solutions to problems and take action in the future society.

The weight of University Requirements (UR) courses is 14 credits.

Through these courses, students will cover the bases of arts and humanities, social sciences, natural sciences as well as attaining core skills related to critical and creative thinking and technical writing.

### 1-University Requirements (Liberal Arts) Core Courses

Each student has to take the following 8 core (mandatory) courses. These courses are classified as follows:

<b>A. Arts and Humanities</b>	Prerequisites	Cr Hrs.
1. URM 111 Human Rights	none	1
<b>B. Social Sciences</b>	Prerequisites	Cr Hrs.
2. URM 121 Entrepreneurship and Innovation	none	2
<b>C. Natural Sciences</b>	Prerequisites	Cr Hrs.
3. URM 211 Natural Resources and Sustainability	none	1
<b>D. Key Skills</b>	Prerequisites	Cr Hrs.
4. URM 112 Introduction to Computers <sup>+++</sup>	none	2
5. URM 122 Marketing & Digital Strategy	none	2
6. URM 221 Creative & Scientific Thinking	none	2
7. URM 321 Research Methods & Ethics	none	2
8. URM 421 Communication Skills	none	2
<b>Total</b>		14

### 2-University (Liberal Arts) Elective “Zero-Credit” Courses

The student is free to select any four courses from each of the following four categories of A, B, C and D in accordance with his/her study level for further self-long-life learning.

Student should pass these four “none-credit” courses to be graduated.

<b>A. Arts and Humanities</b>	Prerequisites	Cr Hrs.
1. URE 125 Music and Technology	none	1
2. URE 126 Theater and Drama	none	1
3. URE 127 Physical Education	none	1
4. URE 128 Art and Architecture of Ancient Egypt	none	1

5. URE 129 Modern Egyptian History	none	1
<b>B. Social Sciences</b>	Prerequisites	Cr Hrs.
1. URE 225 Peace Studies	none	1
2. URE 226 Public Policy	none	1
3. URE 227 Egyptian Business Regulations	none	1
4. URE 228 Sociology of work	none	1
5. URE 229 African and Middle Eastern studies	none	1
<b>C. Natural Sciences</b>	Prerequisites	Cr Hrs.
1. URE 325 Introduction to Life Sciences	none	1
2. URE 326 Introduction to Environmental Biology	none	1
3. URE 327 Water and Politics in Africa and Middle East	none	1
4. URE 328 Astronomy	none	1
5. URE 329 Natural Resources and Sustainability	none	1
<b>D. Key Skills</b>	Prerequisites	Cr Hrs.
1. URE 427 Safety, Security, & First Aids	none	1
2. URE 428 Key skills seminar	none	1
3. URE 429 Transformational Leadership	none	1

### Faculty Requirements – Core Basic Sciences Courses

Basic sciences courses are equivalent to 25 credit hours, including courses in Mathematics, English, Physics, Electronics, Management, Organizational Behavior, Feasibility Studies, and Economics, and Business build strong basic science background of computing and informatics for students.

Course Code	Course Title	Prerequisites	Credits
BSM 113	English (1)	none	2
BSM 114	Physics	none	3
BSM 115	Fundamentals of Management & Economics	none	3
BSM 116	Mathematics (1): Calculus for Computing Science	none	2
BSM 124	English (2)	none	2
BSM 126	Mathematics (2): Linear Algebra & Applications	none	2
BSM 212	Electronics	BSM 114	3

Course Code	Course Title	Prerequisites	Credits
BSM 213	Project Management Professional	BSM 115	3
BSM 214	Probability & Statistics	BSM 126	3
BSM 222	Mathematics (3)	BSM 116	2
<b>Total</b>			<b>25</b>

### Faculty Requirements – Core Computing science Courses

Faculty requirements of core computing courses are these courses offered to all students of the faculty programs by different departments which lead to further strong core science background for all computing & informatics students.

The weight of these courses is equivalent to 46 credit hours.

Course Code	Course Title	Prerequisites	Credits
URM 112	Introduction to Computers <sup>+++</sup>	none	1
CSM 117	Introduction to Programming	none	4
BSM 123	Discrete Mathematics & Graph Theory	none	3
BSM 125	Digital Systems	none	3
CSM 127	Object Oriented Programming	CSM 117	4
CSM 215	Microprocessors	BSM 125	4
CSM 216	Data Structures	BSM 123, CSM 127	4
CSM 223	Visual Programming	CSM 127	3
CSM 224	Computer Architecture	CSM 215	4
CSM 225	Computer Security	CSM 216	3
ISM 226	Database Management Systems	CSM 216	4
CSM 311	Operating Systems	CSM 224, CSM 225	3
ISM 312	Operation Research (1)	BSM 214, CSM 216	3
NTM 313	Computer Networks	BSM 222	3
FRM 429	Field Training	none	0
<b>Total</b>			<b>46</b>

## **Graduation Project**

In the final two semesters, a senior student must be engaged in one of the research laboratories of the corresponding department to carry out his/her graduation project. The graduation project weights six credit hours distributed on two semesters. One credit hour for the project is equivalent to four contact hours in labs/practical because the student needs to stay enough time in a research lab during the project period according to the Faculty best practices. The student must earn at least 103 Credit Hours Level (including successfully passing all of program's Level Three mandatory courses required by the project) to register for the graduation project. The first part of the graduation project must be registered first, while the second part of the graduation project can be registered the semester following that of the first part.

## Chiefs of the Departments

No.	Department	Head of the Department	Notes
1	Computer Science	Prof. Mohamed Fuad	Program updater
2	Information Systems	Ass. Prof. Basem Sheta	Program updater
3	Artificial Intelligence	Ass. Prof. Hosam EL-Beharry	Program founder
4	Networks Technology	Dr. Khaled ELMenshawy	Program founder

## Graduate Title and work description

No.	Department	Graduate Title and work description
1	Computer Science	<b>Application Developer</b> ; Develop the desktop, web, and mobile applications.
2	Information Systems	<b>Data Analyst</b> : Analyze and design Information systems and perform business intelligence tasks.
3	Artificial Intelligence	<b>Data Scientist</b> : Develop an AI modules to achieve insight into a given datasets.
4	Networks Technology	<b>Network Administrator</b> : Designs, implements, and manages enterprise networks (LAN, Wireless, and Mobile) and can configure network devices in additional network operating systems.

## Academies that support Programs for the labor market

No.	Academy	Tracks	Program
1	CISCO	CCNA, Cybersecurity, IoT, WLAN	Networks Technology
		C++, Python	Computer Science, AI
2	HUAWEI ICT	Datacom, IoT, 5G, Security	Networks Technology
		Big data, Storage, Cloud Comp.	Information Systems
		AI	Artificial Intelligence
3	EC-Council	Ethical Hacker, Pen. Testing	Networks Technology



**Faculty of Information Systems & Computer Science**  
**Department of Computer Science**  
**Undergraduate Program Specification**  
**Computer Science Program**

## **1. Program Mission**

Computer Science (CS) Program advances the art of CS inspired by the problems arising in the field of computing sciences. The program trains future computer scientists in the theoretical / practical applications of this specialization. Computer Science is the central to all aspects of information technology.

Program intends to produce graduates as competent computer science practitioners who have a solid foundation of basic and fundamental knowledge and experience in applying the existing technology to contemporary problems. This program well addresses the analytic skills required by students to develop their abilities in research and to proceed for postgraduate study.

## **2. Program Objectives**

Computer Science program is designed to provide the student with the foundations of the discipline as well as the opportunity for specialization.

The Program Educational Objectives are:

1. To educate and train students in the fundamentals of computer science and mathematics, in order to analyze and solve computing problems, as demonstrated by their professional accomplishments in industry, government and graduate programs and measured within three to five years after graduation.
2. To educate students with an understanding of real-world computing needs, as demonstrated by their ability to address technical issues involving computing problems encountered in industry, government and graduate programs and measured within three to five years after graduation.
3. To train students to work effectively, professionally and ethically in computing-related professions, as demonstrated by their communications, teamwork and leadership skills in industry, government and graduate programs and measured within three to five years after graduation.

**After successfully completing Computer Science program, graduate:**

**Generally, in the computing and Information should be able to:**

1. Apply fundamental concepts; techniques and latest technologies of computing, algorithms; systems development and networking to different types of real-world problems.
2. Able to evaluate systems requirements and user needs to develop integrated solutions.
3. Participate in all work processes and products to assure quality, accuracy and completeness within ICT environment.
4. Demonstrate professional responsibilities as well as ethical, societal and cultural concern with respect to ICT practices and usage.
5. Able to think clearly and logically with deep analytical skills to solve real world problems.
6. Contribute to the development and empowerment of his/her community.
7. Demonstrate effective communication; leadership; business administration and entrepreneurial skills.
8. Work collaboratively and engage in-group decision making within multi-disciplinary teams.
9. Able to analyze quantitative and qualitative data including financial, industry and scientific data.
10. Able to engage in life learning continuous professional development including post-graduate and research studies.

**And specially, in the computer science program should be able to:**

1. Apply different computer science themes, such as abstraction, complexity, and evolutionary change.
2. Apply mathematical foundations, algorithmic principles to develop computer applications for different platforms including embedded systems, high-performance clusters, and distributed clouds.
3. Utilize a set of general principles, such as sharing a common resource, security issue, and concurrency.
4. Use different types of programming languages and tools to develop real world applications.

## Typical Study Plan of CS - Program

Prereq. LEVEL 1				Prereq. LEVEL 3			
<b>1<sup>ST</sup> Semester</b>	URM 111	none	Human Rights	<b>1<sup>ST</sup> Semester</b>	CSM 311	CSM224,CSM225	Operating Systems
	URM 112	none	Introduction to Computers		ISM 312	BSM214,CSM216	Operations Research (1)
	BSM 113	none	English Language (1)		NTM 313	BSM222	Computer Networks
	BSM 114	none	Physics		CSM 314	CSM 216	Software Engineering (1)
	BSM 115	none	Fund. of Manag. & Economics		AIM 315	BSM214,CSM216	Artificial Intelligence
	BSM 116	none	Mathematics (1)		CSE 316	CSM 216	Elective (1)
	CSM 117	none	Introduction to Programming				
<b>2<sup>nd</sup> Semester</b>	URM 121	none	Entrepreneurship & Innovation	<b>2<sup>nd</sup> Semester</b>	URM 321	none	Research Methods & Ethics
	URM 122	none	Marketing & Digital Strategy		CSM 322	CSM224	Theory of Compilers
	BSM 123	none	Discrete Mathematics		CSM 323	CSM311,NTM313	Distributed Computer Systems
	BSM 124	none	English Language (2)		CSM 324	CSM216,BSM222	Computer Graphics
	BSM 125	none	Digital Systems		CSM 325	CSM 314	Theory of Algorithms
	BSM 126	none	Mathematics (2)		CSE 326	CSM216,BSM222	Elective (2)
	CSM 127	CSM 117	Object Oriented Programming				
LEVEL 2				LEVEL 4			
<b>1<sup>ST</sup> Semester</b>	URM 211	none	Natural Res & Sustainability	<b>1<sup>ST</sup> Semester</b>	ISM 411	ISM226,NTM313	Web App Development
	BSM 212	BSM 114	Electronics		NTM 412	ISM226,NTM313	Cloud Computing
	BSM 213	BSM 115	Project Management Professional		ISM 413	ISM 226	Database Management Sys. (2)
	BSM 214	BSM 126	Probability & Statistics		CSM 414	CSM 314	Software Engineering (2)
	CSM 215	BSM 125	Microprocessors		CSE 415	CSM127,CSM324	Elective (3)
	CSM 216	123, 127	Data Structures		FRM 416	Article (40)	Project (1)
<b>2<sup>nd</sup> Semester</b>	URM 221	none	Creative & Scientific Thinking	<b>2<sup>nd</sup> Semester</b>	URM 421	none	Communication Skills
	BSM 222	BSM 116	Mathematics (3)		NTM 422	NTM 313	Internet of Things
	CSM 223	CSM 127	Visual Programming		CSM 423	CSM 324	Human Computer Interactions
	CSM 224	CSM 215	Computer Architecture		CSM 424	NTM313	Parallel Programming
	CSM 225	CSM 216	Computer Security		CSE 425	AIM 315	Elective (4)
	ISM 226	CSM 216	Database Management Sys. (1)		FRM 426	FRM 416	Project (2)

## Faculty of I.S. & C.S. - Course Map of “Computer Science” Program

Level 1		Level 2		Level 3		Level 4	
Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2
Human Rights (1-Cr)	Entrepreneurship & Innovation (2-Cr)	Natural Res & Sustainability (1-Cr)	Creative & Scientific Thinking (2-Cr)	Operating Systems (3-Cr)	Research Methods & Ethics (2-Cr)	Web App. Develop. (3-Cr)	Comm. Skills (2-Cr)
Introduction to Computers +++ (3-Cr)	Marketing & Digital Strategy (2-Cr)	Electronics (3-Cr)	Mathematics (3) (2-Cr)	Oper. Res. (1) (3-Cr)	Theory of Compilers (3-Cr)	Cloud Computing (3-Cr)	Internet of Things (3-Cr)
Physics (3-Cr)	Discrete Mathematics (3-Cr)	Project Manag. Professional (3-Cr)	Visual Prog. (3-Cr)	Comp. Netw. (1) (3-Cr)	Dist. Comp. Sys. (3-Cr)	Database Manag. Sys. (2) (3-Cr)	Human Comp. Inter. (4-Cr)
English Lang. (1) (2-Cr)	English Lang. (2) (2-Cr)	Probability & Statistics (3-Cr)	Comp. Architecture (4-Cr)	Software Eng. (1) (3-Cr)	Comp. Graphics (3-Cr)	Software Eng. (2) (3-Cr)	Parallel Programming (3-Cr)
Fund. of Manage & Economics (3-Cr)	Digital Systems (3-Cr)	Microprocessors (4-Cr)	Computer Security (3-Cr)	Artificial Intelligence (3-Cr)	Th. of Algorithms (4-Cr)	Project (1) (3-Cr)	Project (2) (3-Cr)
Mathematics (1) (2-Cr)	Mathematics (2) (2-Cr)	Data Structures (4-Cr)	Database Manag. Sys. (1) (4-Cr)	Elective (1) (3-Cr)  S/W Comp. Des. S/W Verification S/W Quality Assu.	Elective (2) (3-Cr)  Image Proc. Gamification S.T.in Comp.Graph.	Elective (3) (3-Cr)  3-D Modeling Comp. Animation Multimedia	Elective (4) (3-Cr)  Expert Systems Neural Networks Fuzzy Systems
18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr

University Req.  
9.72 % ( 14 Cr)

Faculty Req.  
21.35% ( 31 Cr)

Departmental Compulsory  
60.42 % ( 87 Cr)

Departmental Electives  
8.33 % ( 12 Cr)

**Total: 144 Cr**

### Computer Science - Program Typical Study Plan

## Level 1

Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
<b>First</b>	URM 111	Human Rights حقوق الإنسان	none	1	1	-	-	20	20	-	60	-
	URM 112	Introduction to Computers +++ مقدمة في الحاسبات +++	none	3	2	1	1	20	10	10	40	20
	BSM 113	English Language (1) لغة إنجليزية (1)	none	2	1	2	-	20	10	10	60	-
	BSM 114	Physics فيزياء	none	3	2	1	1	20	10	10	40	20
	BSM 115	Fund of Manage & Economics أساسيات الإدارة والاقتصاد	none	3	3	-	-	20	20	-	60	-
	BSM 116	Mathematics (1) الرياضيات (1): حساب التفاضل والتكامل لعلوم الحاسب	none	2	1.5	1	-	20	10	10	60	-
	CSM 117	Introduction to Programming مقدمة في البرمجة	none	4	2	2	2	20	10	10	40	20
Total				18	12.5	7	4					

Level 1												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 121	Entrepreneurship & Innovation ريادة الأعمال والابتكار	none	2	2	-	-	20	20	-	60	-
	URM 122	Marketing & Digital Strategy التسويق والاستراتيجية الرقمية	none	2	2	-	-	20	20	-	60	-
	BSM 123	Discrete Math & Graph الرياضيات المنفصلة ونظرية الرسم البياني	none	3	2	2	-	20	10	10	60	-
	BSM 124	English Language (2) لغة إنجليزية (٢)	none	2	1	2	-	20	10	10	60	-
	BSM 125	Digital Systems الأنظمة الرقمية	none	3	2	1	1	20	10	10	40	20
	BSM 126	Mathematics (2) الرياضيات (٢): الجبر الخطي والتطبيقات	none	2	1.5	1	-	20	10	10	60	-
	CSM 127	Object Oriented Programming البرمجة الشيئية	CSM 117	4	3	1	1	20	10	10	40	20
Total				18	13.5	7	2					

Students must take - in this semester - a university requirement elective course from pool URE 12X Arts and Humanities (zero-credit, Pass/Fail)

## Level 2

Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
<b>First</b>	URM 211	Natural Res & Sustainability الموارد الطبيعية والاستدامة	none	1	1	-	-	20	20	-	60	-
	BSM 212	Electronics إلكترونيات	BSM 114	3	2	1	1	20	10	10	40	20
	BSM 213	Project Manage Professional إدارة المشاريع الاحترافية	BSM 115	3	2	1	1	20	10	10	60	-
	BSM 214	Probability & Statistic الاحتمالات والإحصاء	BSM 126	3	2	2	-	20	10	10	60	-
	CSM 215	Microprocessors المعالجات الدقيقة	BSM 125	4	3	1	1	20	10	10	40	20
	CSM 216	Data Structures هياكل البيانات	BSM 123, CSM 127	4	3	1	1	20	10	10	40	20
Total				18	13	6	4					

Level 2												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 221	Creative & Scientific Thinking التفكير الإبداعي والعلمي	none	2	2	-	-	20	20	-	60	-
	BSM 222	Mathematics (3) الرياضيات (٣)	BSM 116	2	1.5	1	-	20	10	10	60	-
	CSM 223	Visual Programming البرمجة المرئية	CSM 127	3	2	1	1	20	10	10	40	20
	CSM 224	Computer Architecture هندسة الحاسب	CSM 215	4	3	1	1	20	10	10	40	20
	CSM 225	Computer Security تأمين الحاسب	CSM 216	3	2	1	1	20	10	10	60	-
	ISM 226	Database Management Systems (1) نظم إدارة قواعد البيانات (١)	CSM 216	4	3	1	1	20	10	10	40	20
Total				18	13.5	5	4					

Students must take - in this semester - a university requirement elective course from pool URE 22X Social Sciences (zero-credit, Pass/Fail)



Level 3												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
First	CSM 311	Operating Systems نظم تشغيل	CSM224,CSM225	3	2	-	2	20	10	10	40	20
	ISM 312	Operations Research (1) بحوث عمليات (1)	BSM214,CSM216	3	2	1	1	20	10	10	40	20
	NTM 313	Computer Networks شبكات الحاسب	BSM 222	3	2	1	1	20	10	10	40	20
	CSM 314	Software Engineering (1) هندسة برمجيات (1)	CSM 216	3	2	1	1	20	10	10	40	20
	AIM 315	Artificial Intelligence ذكاء اصطناعي	BSM 214, CSM 216	3	2	2	-	20	10	10	60	-
	CSE 316	Elective (1) اختياري (1)	CSM 216	3	2	2	-	20	10	10	60	-
Total				18	12	7	5					

### CSE 316 - Computer Science Elective (1)

- a - Software component design
- b- Software verification
- c- Software quality assurance

Level 3												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 321	Research Methods & Ethics طرق وأخلاقيات البحث العلمي	none	2	2	-	-	20	20	-	60	-
	CSM 322	Theory of Compilers نظرية المترجمات	CSM224	3	2	2	-	20	10	10	60	-
	CSM 323	Distributed Comp Sys نظم الحاسبات الموزعة	CSM311,NTM313	3	2	1	1	20	10	10	40	20
	CSM 324	Computer Graphics جرافيكس	CSM216,BSM222	3	2	1	1	20	10	10	40	20
	CSM 325	Theory of Algorithms نظريات الخوارزميات	CSM 314	4	3	2	-	20	10	10	60	-
	CSM 326	Elective (2) اختياري (٢)	CSM216,BSM222	3	2	1	1	20	10	10	40	20
Total				18	13	7	3					

Students must take - in this semester - a university requirement elective course from pool URE 32X Natural Sciences (zero-credit, Pass/Fail)

### CSE 326 - Computer Science Elective (2)

- a - Image processing
- b- Gamification
- c- Selected topics in computer graphics

Level 4												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
First	ISM 411	Web App Development تطبيقات الإنترنت	ISM226,NTM313	3	2	-	2	20	10	10	40	20
	NTM 412	Cloud Computing الحوسبة السحابية	ISM 226, NTM 313	3	2	1	1	20	10	10	40	20
	ISM 413	Database Manag. Sys. (2) نظم إدارة قواعد البيانات (٢)	ISM 226	3	2	1	1	20	10	10	40	20
	CSM 414	Software Engineering (2) هندسة برمجيات (٢)	CSM 314	3	2	1	1	20	10	10	40	20
	CSE 415	Elective (3) اختياري (٣)	CSM127,CSM324	3	2	1	1	20	10	10	40	20
	FRM 416	Project (1) مشروع تخرج (١)	Article (40)	3	2	-	2	20	10	10	40	20
Total				18	12	4	8					

### CSE 415 - Computer Science Elective (3)

- a- 3D Modeling
- b- Computer Animation
- c- Multimedia

Level 4												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 421	Communication Skills مهارات الاتصال	none	2	2	-	-	20	-	-	60	-
	NTM 422	Internet of Things إنترنت الأشياء	NTM 313	3	2	1	1	20	10	10	40	20
	CSM 423	Human Comp. Inter. تفاعل الإنسان والآلة	CSM 324	4	3	1	1	20	10	10	40	20
	CSM 424	Parallel Programming البرمجة المتوازية	NTM313	3	2	1	1	20	10	10	60	-
	CSE 425	Elective (4) اختياري (٤)	AIM 315	3	2	1	1	20	10	10	40	20
	FRM 426	Project (2) مشروع تخرج (٢)	FRM 416	3	2	-	2	20	10	10	40	20
	FRM 429	Field Training التدريب الميداني	none	0	-	-	-	-	-	-	P/F	-
Total				18	13	4	6					

Students must take - in this semester - a university requirement elective course from pool URE 42X Key Skills (zero-credit, Pass/Fail)

#### CSE 425 - Computer Science Elective (4)

- a- Expert Systems
- b- Neural Networks
- c- Fuzzy Systems

**Faculty of Information Systems & Computer Science**  
**Department of Information Systems**  
**Undergraduate Program Specification**  
**Information Systems Program**

### **Program Mission**

Delivering high quality, accessible undergraduate information systems education to a diverse student population. The department prepares students to analyze, design, develop and use business applications utilizing contemporary technology. Also, providing a balance between fundamental information systems concepts and the application of these concepts from a future-oriented perspective.

### **Program Objectives**

1. To introduce students to relevant information technologies, teamwork, and decision making necessary for the integration of business processes using information technology.
2. To provide students with understanding of the strategic use of information systems.
3. To prepare students to use the systems development life cycle along with its tools, techniques, methodologies, and processes, to develop computer-based information systems that meet the needs of businesses and organizations.
4. To equip students with the ability to analyze the motivations, architectures, and implementation of IS security policy technologies and practices.
5. To provide students with web development and object-oriented programming skills to use in the development of solutions in business.
6. To provide students with database skills used to perform data analysis, design, implementation, and administration.
7. To equip students with a thorough understanding of the existing use of data communications networks and future developments in this area.
8. To prepare students for the development of computer-based systems projects from the point of request through analysis, design, development, documentation, testing, and implementation.

**After successfully completing Computer Science program, graduate should be:**

Generally, in the computing and Information should be able to:

1. Apply fundamental concepts; techniques and latest technologies of computing, algorithms; systems development and networking to different types of real-world problems.
2. Able to evaluate systems requirements and user needs to develop integrated solutions.
3. Participate in all work processes and products to assure quality, accuracy and completeness within ICT environment.
4. Demonstrate professional responsibilities as well as ethical, societal and cultural concern with respect to ICT practices and usage.
5. Able to think clearly and logically with deep analytical skills to solve real world problems.
6. Contribute to the development and empowerment of his/her community.
7. Demonstrate effective communication; leadership; business administration and entrepreneurial skills.
8. Work collaboratively and engage in-group decision making within multi-disciplinary teams.
9. Able to analyze quantitative and qualitative data including financial, industry and scientific data.
10. Able to engage in life learning continuous professional development including post-graduate and research studies.

**And specially, in the information systems program should be able to:**

1. Think and be creative through the programs offered and free studies included and provided students with research and debriefing skills enabling them to offer appropriate solutions in the field their specialty.
2. Provide students with the basic skills to prepare presentations, negotiate and communicate so they can integrate different labor markets.
3. Recognize problems that could be solved via Information Systems.
4. Manage the storage and retrieval of digital data.
5. Design, create, manipulate, and implement computer-based information systems.
6. Familiarity with the ethical and legal standards and responsibilities of a profession.

## Typical Study Plan of IS - program

LEVEL 1				LEVEL 3			
<b>1<sup>ST</sup> Semester</b>	Prereq.			<b>1<sup>ST</sup> Semester</b>			
	URM 111	none	Human Rights		CSM 311	CSM224,CSM225	Operating Systems
	URM 112	none	Introduction to Computers +++		ISM 312	BSM214,CSM216	Operations Research (1)
	BSM 113	none	English Language (1)		NTM 313	BSM 222	Computer Networks
	BSM 114	none	Physics		ISM 314	CSM223,ISM226	System Analysis & Design
	BSM 115	none	Fund of Manage & Economics		ISM 315	ISM 226	Information Systems
	BSM 116	none	Mathematics (1)		ISE 316	CSM 216	Elective (1)
CSM 117	none	Introduction to Programming					
<b>2<sup>nd</sup> Semester</b>	URM 121	none	Entrepreneurship & Innovation	<b>2<sup>nd</sup> Semester</b>	URM 321	none	Research Methods & Ethics
	URM 122	none	Marketing & Digital Strategy		ISM 322	ISM 312	Operation Research (2)
	BSM 123	none	Discrete Mathematics and graph		CSM 323	CSM311,NTM313	Distributed Computer Systems
	BSM 124	none	English Language (2)		ISM 324	ISM 226	Information Retrieval
	BSM 125	none	Digital Systems		ISM 325	ISM312,ISM314	Modeling & Simulation
	BSM 126	none	Mathematics (2)		ISE 326	ISM 315	Elective (2)
	CSM 127	CSM 117	Object Oriented Programming				
LEVEL 2				LEVEL 4			
<b>1<sup>ST</sup> Semester</b>	URM 211	none	Natural Res & Sustainability	<b>1<sup>ST</sup> Semester</b>	ISM 411	ISM226,NTM313	Web App Development
	BSM 212	BSM 114	Electronics		ISM 412	ISM 315	Business Intelligence
	BSM 213	BSM 115	Project Management Professional		ISM 413	ISM 226	Database Management Sys. (2)
	BSM 214	BSM 126	Probability & Statistics		ISM 414	ISM 315	E - Commerce
	CSM 215	BSM 125	Microprocessors		ISE 415	ISM315,ISM325	Elective (3)
	CSM 216	123, 127	Data Structures		FRM 416	Article (40)	Project (1)
<b>2<sup>nd</sup> Semester</b>	URM 221	none	Creative & Scientific Thinking	<b>2<sup>nd</sup> Semester</b>	URM 421	none	Communication Skills
	BSM 222	BSM 116	Mathematics (3)		ISM 422	CSM225, NTM 313	Information Security
	CSM 223	CSM 127	Visual Programming		ISM 423	NTM313, ISM 315	Big Data
	CSM 224	CSM 215	Computer Architecture		ISM 424	ISM 315	Knowledge Management
	CSM 225	CSM 216	Computer Security		ISE 425	ISM 412	Elective (4)
	ISM 226	CSM 216	Database Management Sys. (1)		FRM 426	FRM 416	Project (2)

## Faculty of I.S. & C.S. - Course Map of "Information Systems" Program

Level 1		Level 2		Level 3		Level 4	
Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2
Human Rights (1-Cr)	Entrepreneurship & Innovation (2-Cr)	Natural Res & Sustainability (1-Cr)	Creative & Scientific Thinking (2-Cr)	Operating Systems (3-Cr)	Research Methods & Ethics (2-Cr)	Web App. Develop. (3-Cr)	Comm. Skills (2-Cr)
Introduction to Computers+++ (3-Cr)	Marketing & Digital Strategy (2-Cr)	Electronics (3-Cr)	Mathematics (3) (2-Cr)	Oper. Res. (1) (3-Cr)	Oper. Res. (2) (3-Cr)	Knowledge Management. (3-Cr)	Information Security (3-Cr)
Physics (3-Cr)	Discrete Mathematics (3-Cr)	Project Manag. Professional (3-Cr)	Visual Prog. (3-Cr)	Comp. Net. (1) (3-Cr)	Dist. Comp. Sys. (3-Cr)	Database Manag. Sys. (2) (3-Cr)	Big data (4-Cr)
English Lang. (1) (2-Cr)	English Lang. (2) (2-Cr)	Probability & Statistics (3-Cr)	Comp. Architecture (4-Cr)	Sys. Analysis & Design (3-Cr)	Modeling and Simulation (4-Cr)	E-Commerce (3-Cr)	Business Intelligence (3-Cr)
Fund. of Manage & Economics (3-Cr)	Digital Systems (3-Cr)	Microprocessors (4-Cr)	Computer Security (3-Cr)	Information Systems (3-Cr)	Information Retrieval (3-Cr)	Project (1) (3-Cr)	Project (2) (3-Cr)
Mathematics (1) (2-Cr)	Mathematics (2) (2-Cr)	Data Structures (4-Cr)	Database Manag. Sys. (1) (4-Cr)	Elective (1) (3-Cr) Storage Tech. Database Security Object-Oriented DB	Elective (2) (3-Cr) Geographic IS. Healthcare IS. Multimedia IS.	Elective (3) (3-Cr) Strategic planning of IS DSS Applied Info. Theory	Elective (4) (3-Cr) Intelligent IS Data Mining Mining Social Media
Intro. to Prog. (4-Cr)	Obj. Or. Prog. (4-Cr)						
18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr

University Req.  
9.72% ( 14 Cr)

Faculty Req.  
21.35% ( 31 Cr)

Departmental Compulsory  
60.42% ( 87 Cr)

Departmental Electives  
8.33% ( 12 Cr)

Total: 144 Cr



## Information Systems - Program Typical Study Plan

Level 1												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
First	URM 111	Human Rights حقوق الإنسان	none	1	1	-	-	20	20	-	60	-
	URM 112	Introduction to Computers +++ مقدمة في الحاسبات +++	none	3	2	1	1	20	10	10	40	20
	BSM 113	English Language (1) لغة إنجليزية (1)	none	2	1	2	-	20	10	10	60	-
	BSM 114	Physics فيزياء	none	3	2	1	1	20	10	10	40	20
	BSM 115	Fund of Manage & Economics أساسيات الإدارة والاقتصاد	none	3	3	-	-	20	20	-	60	-
	BSM 116	Mathematics (1) الرياضيات (1): حساب التفاضل والتكامل لعلوم الحاسب	none	2	1.5	1	-	20	10	10	60	-
	CSM 117	Introduction to Programming مقدمة في البرمجة	none	4	2	2	2	20	10	10	40	20
Total				18	12.5	7	4					

Level 1												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 121	Entrepreneurship & Innovation ريادة الأعمال والابتكار	none	2	2	-	-	20	20	-	60	-
	URM 122	Marketing & Digital Strategy التسويق والاستراتيجية الرقمية	none	2	2	-	-	20	20	-	60	-
	BSM 123	Discrete Math & Graph الرياضيات المنفصلة ونظرية الرسم البياني	none	3	2	2	-	20	10	10	60	-
	BSM 124	English Language (2) لغة إنجليزية (٢)	none	2	1	2	-	20	10	10	60	-
	BSM 125	Digital Systems الأنظمة الرقمية	none	3	2	1	1	20	10	10	40	20
	BSM 126	Mathematics (2) الرياضيات (٢): الجبر الخطي والتطبيقات	none	2	1.5	1	-	20	10	10	60	-
	CSM 127	Object Oriented Programming البرمجة الشيئية	CSM 117	4	3	1	1	20	10	10	40	20
Total				18	13.5	7	2					

Students must take - in this semester - a university requirement elective course from pool URE 12X Arts and Humanities (zero-credit, Pass/Fail)

## Level 2

Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
<b>First</b>	URM 211	Natural Res & Sustainability الموارد الطبيعية والاستدامة	none	1	1	-	-	20	20	-	60	-
	BSM 212	Electronics إلكترونيات	BSM 114	3	2	1	1	20	10	10	40	20
	BSM 213	Project Manage Professional إدارة المشاريع الاحترافية	BSM 115	3	2	1	1	20	10	10	60	-
	BSM 214	Probability & Statistic الاحتمالات والإحصاء	BSM 126	3	2	2	-	20	10	10	60	-
	CSM 215	Microprocessors المعالجات الدقيقة	BSM 125	4	3	1	1	20	10	10	40	20
	CSM 216	Data Structures هياكل البيانات	BSM 123, CSM 127	4	3	1	1	20	10	10	40	20
<b>Total</b>				18	13	6	4					

Level 2												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 221	Creative & Scientific Thinking التفكير الإبداعي والعلمي	none	2	2	-	-	20	20	-	60	-
	BSM 222	Mathematics (3) الرياضيات (٣)	BSM 116	2	1.5	1	-	20	10	10	60	-
	CSM 223	Visual Programming البرمجة المرئية	CSM 127	3	2	1	1	20	10	10	40	20
	CSM 224	Computer Architecture هندسة الحاسب	CSM 215	4	3	1	1	20	10	10	40	20
	CSM 225	Computer Security تأمين الحاسب	CSM 216	3	2	1	1	20	10	10	60	-
	ISM 226	Database Management Systems (1) نظم إدارة قواعد البيانات (١)	CSM 216	4	3	1	1	20	10	10	40	20
Total				18	13.5	5	4					

Students must take - in this semester - a university requirement elective course from pool URE 22X Social Sciences (zero-credit, Pass/Fail)

Level 3												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
First	CSM 311	Operating Systems نظم تشغيل	CSM224,CSM225	3	2	-	2	20	10	10	40	20
	ISM 312	Operations Research (1) بحوث عمليات (1)	BSM214,CSM216	3	2	1	1	20	10	10	40	20
	NTM 313	Computer Networks شبكات الحاسب	BSM 222	3	2	1	1	20	10	10	40	20
	ISM 314	Systems Analysis and Design تحليل وتصميم النظم	CSM 223, ISM 226	3	2	2	-	20	10	10	60	-
	ISM 315	Information Systems نظم المعلومات	ISM 226	3	2	2	-	20	10	10	60	-
	ISE 316	Elective (1) اختياري (1)	CSM 216	3	2	2	-	20	10	10	60	-
Total				18	12	8	4					

### ISE 316 - Information Systems Elective (1)

- a- Storage Technologies
- b- Database Security
- c- Object Oriented Database

Level 3												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 321	Research methods & Ethics أساليب البحث وأخلاقياته	none	2	2	-	-	20	20	-	60	-
	ISM 322	Operations Research (2) بحوث عمليات (2)	ISM 312	3	2	1	1	20	10	10	40	20
	CSM 323	Distributed Comp. Systems أنظمة الحاسبات الموزعة	CSM311, NTM313	3	2	1	1	20	10	10	40	20
	ISM 324	Information Retrieval استرجاع المعلومات	ISM 226	3	2	2	-	20	10	10	60	-
	ISM 325	Modeling and Simulation النمذجة والمحاكاة	ISM 312, ISM 314	4	3	1	1	20	10	10	40	20
	ISE 326	Elective (2) اختياري (2)	ISM 315	3	2	2	-	20	10	10	60	-
Total				18	13	7	3					

Students must take - in this semester - a university requirement elective course from pool URE 32X Natural Sciences (zero-credit, Pass/Fail)

**ISE 326 - Information Systems Elective (2)**

- a- Geographic Information System
- b- Healthcare Information System
- c- Multimedia Information System

Level 4												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
First	ISM 411	Web Applications Development تطوير تطبيقات الويب	ISM226,NTM313	3	2	-	2	20	10	10	40	20
	ISM 412	Business Intelligence ذكاء الأعمال	ISM 315	3	2	1	1	20	10	10	40	20
	ISM 413	Database Systems (2) نظم قواعد البيانات (2)	ISM 226	3	2	1	1	20	10	10	40	20
	ISM 414	E-Commerce التجارة الإلكترونية	ISM 315	3	2	2	-	20	10	10	60	-
	ISE 415	Elective (3) اختياري (1)	ISM 315, ISM 325	3	2	2	-	20	10	10	60	-
	FRM 416	Project (1) مشروع تخرج (1)	Article (40)	3	2	0	2	20	10	10	40	20
Total				18	12	6	6					

### ISE 415 - Information Systems Elective (3)

- a- Strategic Planning of Information Systems
- b- Decision Support Systems
- c- Applied Information Theory

Level 4												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 421	Communication Skills مهارات الاتصال	none	2	2	-	-	20	20	-	60	-
	ISM 422	Information Security أمن المعلومات	CSM 225, NTM 313	3	2	1	1	20	10	10	40	20
	ISM 423	Big Data البيانات الضخمة	NTM 313, ISM 315	4	3	-	2	20	10	10	40	20
	ISM 424	Knowledge Management إدارة المعرفة	ISM 315	3	2	2	-	20	10	10	40	20
	ISE 425	Elective (4) اختياري (4)	ISM 412	3	2	1	1	20	10	10	40	20
	FRM 426	Project (2) مشروع تخرج (2)	FRM 416	3	2	-	2	20	10	10	40	20
	FRM 429	Field Training التدريب الميداني	none	0	-	-	-	-	-	-	-	P/F
Total				18	13	4	6					

Students must take - in this semester - a university requirement elective course from pool URE 42X Key Skills (zero-credit, Pass/Fail)

**ISE 425 - Information Systems Elective (4)**

- a- Intelligent Information Systems
- b- Data Mining
- c- Mining social media



**Faculty of Information Systems & Computer Science**  
**Department of Artificial Intelligence**  
**Undergraduate Program Specification**  
**Artificial Intelligence Program**

### **Program Mission**

To graduate a group of qualified individuals with the scientific knowledge and practical skills necessary to enable them to fulfill their responsibilities in the job sites that relate to business and activities in the field of industrial intelligence, and even to create appropriate applications for the country to achieve a qualitative shift in the field of automated applications.

### **Program Objectives**

#### **Our mission can be accomplished through:**

1. Providing high quality teaching and research in accordance with international standards.
2. Mutual interaction between teachers and students in a manner that supports the responsible good person.
3. Developing the capabilities of students to be able to think scientifically and to establish the method of scientific methods in solving their problems.
4. Directing the educational process and students' research towards contemporary problems and how to transform into an automated society.

#### **After successfully completing Computer Science program, graduate should be:**

Generally, in the computing and Information should be able to:

1. Apply fundamental concepts; techniques and latest technologies of computing, algorithms; systems development and networking to different types of real-world problems.
2. Able to evaluate systems requirements and user needs to develop integrated solutions.
3. Participate in all work processes and products to assure quality, accuracy and completeness within ICT environment.
4. Demonstrate professional responsibilities as well as ethical, societal and cultural concern with respect to ICT practices and usage.
5. Able to think clearly and logically with deep analytical skills to solve real world problems.
6. Contribute to the development and empowerment of his/her community.

7. Demonstrate effective communication; leadership; business administration and entrepreneurial skills.
8. Work collaboratively and engage in-group decision making within multi-disciplinary teams.
9. Able to analyze quantitative and qualitative data including financial, industry and scientific data.
10. Able to engage in life learning continuous professional development including post-graduate and research studies.

**And specially, in the artificial intelligence program should be able to:**

1. Apply the principles and techniques of data and knowledge representation, search, reasoning and learning with different data types.
2. Analyze real world problems, utilizing different problem-solving methods, and apply computational mechanisms.
3. Apply basics of mathematical science, computation theory, and modeling in solving real world problems.
4. Utilize fundamental and modern Artificial Intelligence techniques to develop computer applications in different domains.

## Typical Study Plan of AI - program

Prereq. LEVEL 1				Prereq. LEVEL 3			
<b>1<sup>ST</sup> Semester</b>	URM 111	none	Human Rights	<b>1<sup>ST</sup> Semester</b>	CSM 311	CSM224,CSM225	Operating Systems
	URM 112	none	Introduction to Computers +++		ISM 312	BSM214,CSM216	Operations Research (1)
	BSM 113	none	English Language (1)		NTM 313	BSM 222	Computer Networks
	BSM 114	none	Physics		CSM 314	CSM 216	Software Engineering (1)
	BSM 115	none	Fund of Manage & Economics		AIM 315	BSM 214, CSM 216	Artificial Intelligence
	BSM 116	none	Mathematics (1)		AIE 316	CSM 216	Elective (1)
	CSM 117	none	Introduction to Programming				
<b>2<sup>nd</sup> Semester</b>	URM 121	none	Entrepreneurship & Innovation	<b>2<sup>nd</sup> Semester</b>	URM 321	none	Research Methods & Ethics
	URM 122	none	Marketing & Digital Strategy		AIM 322	CSM 223	IP & Pattern Recognition
	BSM 123	none	Discrete Mathematics & graph		AIM 323	AIM 315	Programming for AI
	BSM 124	none	English Language (2)		CSM 324	CSM216,BSM 222	Computer Graphics
	BSM 125	none	Digital Systems		AIM 325	AIM 315	Fund. of Data Science
	BSM 126	none	Mathematics (2)		AIE 326	CSM 314, AIM 315	Elective (2)
	CSM 127	CSM 117	Object Oriented Programming				
LEVEL 2				LEVEL 4			
<b>1<sup>ST</sup> Semester</b>	URM 211	none	Natural Res & Sustainability	<b>1<sup>ST</sup> Semester</b>	AIM 411	AIM 325	Data Mining & Analytics
	BSM 212	BSM 114	Electronics		AIM 412	AIM 315	Machine Learning
	BSM 213	BSM 115	Project Management Professional		AIM 413	NTM313, CSM314	Embedded Systems
	BSM 214	BSM 126	Probability & Statistics		AIM 414	AIM 315	Intelligent Auto Systems
	CSM 215	BSM 125	Microprocessors		AIE 415	CSM216, AIM315	Elective (3)
	CSM 216	123, 127	Data Structures		FRM 416	Article (40)	Project (1)
<b>2<sup>nd</sup> Semester</b>	URM 221	none	Creative & Scientific Thinking	<b>2<sup>nd</sup> Semester</b>	URM 421	none	Communication Skills
	BSM 222	BSM 116	Mathematics (3)		AIM 422	AIM 315	Natural Lang Processing
	CSM 223	CSM 127	Visual Programming		AIM 423	AIM 323	Deep Learning
	CSM 224	CSM 215	Computer Architecture		CSM 424	NTM 313	Parallel Programming
	CSM 225	CSM 216	Computer Security		AIE 425	AIM 411, AIM 414	Elective (4)
	ISM 226	CSM 216	Database Management Sys. (1)		FRM 426	FRM 416	Project (2)

## Faculty of I.S. & C.S. - Course Map of "Artificial Intelligence" Program

Level 1		Level 2		Level 3		Level 4	
Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2
Human Rights (1-Cr)	Entrepreneurship & Innovation (2-Cr)	Natural Res & Sustainability (1-Cr)	Creative & Scientific Thinking (2-Cr)	Operating Systems (3-Cr)	Research Methods & Ethics (2-Cr)	Data Mining (3-Cr)	Comm. Skills (2-Cr)
Introduction to Computers +++ (3-Cr)	Marketing & Digital Strategy (2-Cr)	Electronics (3-Cr)	Mathematics (3) (2-Cr)	Oper. Res. (1) (3-Cr)	IP and Pattern Recognition (3-Cr)	Machine Learning (3-Cr)	Natural Language processing (3-cr)
Physics (3-Cr)	Discrete Mathematics (3-Cr)	Project Manag. Professional (3-Cr)	Visual Programming (3-Cr)	Comp. Netw. (1) (3-Cr)	Programming for AI (3-Cr)	Embedded Systems (3-Cr)	Deep Learning (4-Cr)
English Lang. (1) (2-Cr)	English Lang. (2) (2-Cr)	Probability & Statistics (3-Cr)	Comp. Architecture (4-Cr)	Software Eng. (1) (3-Cr)	Comp. Graphics (3-Cr)	Int. Autonomous Systems (3-Cr)	Parallel Programming (3-Cr)
Fund. of Manage & Economics (3-Cr)	Digital Systems (3-Cr)	Microprocessors (4-Cr)	Computer Security (3-Cr)	Artificial Intelligence (3-Cr)	Fundamentals of Data Science (4-Cr)	Project (1) (3-Cr)	Project (2) (3-Cr)
Math (1) (2-Cr)	Math (2) (2-Cr)	Data Structures (4-Cr)	Database Manag. Sys. (1) (4-Cr)	Elective (1) (3-Cr)	Elective (2) (3-Cr)	Elective (3) (3-Cr)	Elective (4) (3-Cr)
Intro. to Prog. (4-Cr)	OOP (4-Cr)						
18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr

University Req.  
9.72 % ( 14 Cr)

Faculty Req.  
21.35% ( 31 Cr)

Departmental Compulsory  
60.42 % ( 87 Cr)

Departmental Electives  
8.33 % ( 12 Cr)

Total: 144 Cr

## Artificial Intelligence - Program

## Typical Study Plan

Level 1												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
First	URM 111	Human Rights حقوق الإنسان	none	1	1	-	-	20	20	-	60	-
	URM 112	Introduction to Computers +++ مقدمة في الحاسبات+++	none	3	2	1	1	20	10	10	40	20
	BSM 113	English Language (1) لغة إنجليزية (١)	none	2	1	2	-	20	10	10	60	-
	BSM 114	Physics فيزياء	none	3	2	1	1	20	10	10	40	20
	BSM 115	Fund of Manage & Economics أساسيات الإدارة والاقتصاد	none	3	3	-	-	20	20	-	60	-
	BSM 116	Mathematics (1) الرياضيات (١): حساب التفاضل والتكامل لعلوم الحاسب	none	2	1.5	1	-	20	10	10	60	-
	CSM 117	Introduction to Programming مقدمة في البرمجة	none	4	2	2	2	20	10	10	40	20
Total				18	12.5	7	4					

Level 1												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 121	Entrepreneurship & Innovation ريادة الأعمال والابتكار	none	2	2	-	-	20	20	-	60	-
	URM 122	Marketing & Digital Strategy التسويق والاستراتيجية الرقمية	none	2	2	-	-	20	20	-	60	-
	BSM 123	Discrete Math & Graph الرياضيات المنفصلة ونظرية الرسم البياني	none	3	2	2	-	20	10	10	60	-
	BSM 124	English Language (2) لغة إنجليزية (٢)	none	2	1	2	-	20	10	10	60	-
	BSM 125	Digital Systems الأنظمة الرقمية	none	3	2	1	1	20	10	10	40	20
	BSM 126	Mathematics (2) الرياضيات (٢): الجبر الخطي والتطبيقات	none	2	1.5	1	-	20	10	10	60	-
	CSM 127	Object Oriented Programming البرمجة الشيئية	CSM 117	4	3	1	1	20	10	10	40	20
Total				18	13.5	7	2					

Students must take in this semester a university requirement elective course from pool URE 12X Arts and Humanities (zero-credit, Pass/Fail)

## Level 2

Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
<b>First</b>	URM 211	Natural Res & Sustainability الموارد الطبيعية والاستدامة	none	1	1	-	-	20	20	-	60	-
	BSM 212	Electronics إلكترونيات	BSM 114	3	2	1	1	20	10	10	40	20
	BSM 213	Project Manage Professional إدارة المشاريع الاحترافية	BSM 115	3	2	1	1	20	10	10	60	-
	BSM 214	Probability & Statistic الاحتمالات والإحصاء	BSM 126	3	2	2	-	20	10	10	60	-
	CSM 215	Microprocessors المعالجات الدقيقة	BSM 125	4	3	1	1	20	10	10	40	20
	CSM 216	Data Structures هياكل البيانات	BSM 123, CSM 127	4	3	1	1	20	10	10	40	20
Total				18	13	6	4					

Level 2												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 221	Creative & Scientific Thinking التفكير الإبداعي والعلمي	none	2	2	-	-	20	20	-	60	-
	BSM 222	Mathematics (3) الرياضيات (٣)	BSM 116	2	1.5	1	-	20	10	10	60	-
	CSM 223	Visual Programming البرمجة المرئية	CSM 127	3	2	1	1	20	10	10	40	20
	CSM 224	Computer Architecture هندسة الحاسب	CSM 215	4	3	1	1	20	10	10	40	20
	CSM 225	Computer Security تأمين الحاسب	CSM 216	3	2	1	1	20	10	10	60	-
	ISM 226	Database Management Systems (1) نظم إدارة قواعد البيانات (١)	CSM 216	4	3	1	1	20	10	10	40	20
Total				18	13.5	5	4					

Students must take - in this semester - a university requirement elective course from pool URE 22X Social Sciences (zero-credit, Pass/Fail)



Level 3												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
First	CSM 311	Operating Systems نظم تشغيل	CSM224,CSM225	3	2	-	2	20	10	10	40	20
	ISM 312	Operation Research (1) بحوث عمليات (1)	BSM214,CSM216	3	2	1	1	20	10	10	40	20
	NTM 313	Computer Networks شبكات الحاسب	BSM 222	3	2	1	1	20	10	10	40	20
	CSM 314	Software Engineering (1) هندسة برمجيات (1)	CSM 216	3	2	1	1	20	10	10	40	20
	AIM 315	Artificial Intelligence الذكاء الاصطناعي	BSM 214, CSM 216	3	2	2	-	20	10	10	40	20
	AIE 316	Elective (1) اختياري (1)	CSM 216	3	2	2	-	20	10	10	60	-
Total				18	12	7	5					

### AIE 316 - Artificial Intelligence Elective (1)

- a- Storage Technologies.
- b- Data Analytics.
- c- Semantic Web.

Level 3												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 321	Research Methods & Ethics أساليب وأخلاقيات البحث العلمي	none	2	2	-	-	20	20	-	60	-
	AIM 322	Image Proc & Pattern Recognition معالجة الصور والتعرف على الأنماط	CSM 223	3	2	1	1	20	10	10	40	20
	AIM 323	Programming for AI البرمجة للذكاء الاصطناعي	AIM 315	3	2	1	1	20	10	10	40	20
	CSM 324	Computer Graphics الجرافكس	CSM 216, BSM 222	3	2	1	1	20	10	10	40	20
	AIM 325	Fundamentals of Data Science أساسيات علم البيانات	AIM 315	4	3	1	1	20	10	10	40	20
	AIE 326	Elective (2) اختياري (٢)	CSM314, AIM 315	3	2	1	1	20	10	10	40	20
Total				18	13	5	5					

Students must take - in this semester - a university requirement elective course from pool URE 32X Natural Sciences (zero-credit, Pass/Fail)

**AIE 326 - Artificial Intelligence Elective (2)**

- a- Information Retrieval.
- b- Probabilistic Reasoning.
- c- Intelligent Multiagent Systems

Level 4												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
			Lecture	Lab/Tut								
	AIM 411	Data Mining and Analytics التنقيب عن البيانات والتحليلات	AIM 325	3	2	1	1	20	10	10	40	20
AIM 412	Machine Learning تعلم الآلة	AIM 315	3	2	-	2	20	10	10	40	20	
AIM 413	Embedded systems الأنظمة المضمنة	NTM 313, CSM 314	3	2	-	2	20	10	10	60	-	
AIM 414	Intelligent Autonomous Systems الأنظمة مستقلة الحركة الذكية	AIM 315	3	2	1	1	20	10	10	40	20	
AIE 415	Elective 3 اختياري (3)	CSM 216, AIM 315	3	2	1	1	20	10	10	40	20	
FRM 416	Project (1) مشروع تخرج (1)	Article (40)	3	2	-	2	20	10	10	40	20	
Total				18	12	3	9					

### **AIE 415 - Artificial Intelligence Elective (3)**

- a- Cloud Computing.
- b- Business Intelligence.
- c- Virtual Reality.

Level 4												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 421	Communication Skills مهارات التواصل	none	2	2	-	-	20	20	-	60	-
	AIM 422	Natural Language Processing معالجة اللغة الطبيعية	AIM 315	3	2	1	1	20	10	10	60	-
	AIM 423	Deep Learning التعلم العميق	AIM 323	4	3	1	1	20	10	10	40	20
	CSM 424	Parallel Programming البرمجة المتوازية	NTM 313	3	2	1	1	20	10	10	40	20
	AIE 425	Elective (4) اختياري (٤)	AIM 411, AIM 414	3	2	1	1	20	10	10	40	20
	FRM 426	Project (2) مشروع تخرج (٢)	FRM 416	3	2	0	2	20	10	10	60	-
	FRM 429	Field Training التدريب الميداني	none	0	-	-	-	-	-	-	P/F	-
Total				18	13	4	6					

Students must take - in this semester - a university requirement elective course from pool URE 42X Key Skills (zero-credit, Pass/Fail)

**AIE 425 - Artificial Intelligence Elective (4)**

- a- Internet of Things.
- b- Big Data.
- b- Dynamics and Control of Robotics.

**Faculty of Information Systems & Computer Science**  
**Department of Network Technologies**  
**Undergraduate Program Specification**  
**Networking Technologies**

### **Program Mission**

Networking Technologies Program at the Faculty of Information Systems and Computer Science, October 6 University is committed to provide good education and research to create highly competitive cadres of specialists in the field of computer networks in addition to building and providing technical advice and solutions that contribute to the program in social and economic development.

### **Program Objectives**

Networking Technologies Program at the Faculty of Information Systems and Computer Science- October 6 University is one of the best offered programs locally and regionally for academic/scientific research and applications in the field of computer networks.

#### **Its objectives are:**

- 1- Preparing specialized and highly qualified human cadres in network technology and its various fields.
- 2- Provide a high-quality program based on self-education and creative thinking with the application of performance appraisal systems and quality assurance.
- 3- Launching a specialized program in cooperation with specialists in the field, allowing the provision of modern technological specialties.
- 4- Offering a program based on the internationally accredited credit system which allows students to study according to their abilities, preferences and interests.
- 5- Provide students with more space for practical training that meets the requirements of work in all state institutions.
- 6- Highlight and enable scientifically distinguished students to achieve their scientific ambitions.

#### **After successfully completing Networking Technologies program, graduate should be:**

Generally, in the computing and Information, able to:

1. Apply fundamental concepts; techniques and latest technologies of computing, algorithms; systems development and networking to different types of real-world problems.

2. Evaluate systems requirements and user needs to develop integrated solutions.
3. Participate in all work processes and products to assure quality, accuracy and completeness within ICT environment.
4. Demonstrate professional responsibilities as well as ethical, societal and cultural concern with respect to ICT practices and usage.
5. Think clearly and logically with deep analytical skills to solve real world problems.
6. Contribute to the development and empowerment of his/her community.
7. Demonstrate effective communication; leadership; business administration and entrepreneurial skills.
8. Work collaboratively and engage in-group decision making within multi-disciplinary teams.
9. Analyze quantitative and qualitative data including financial, industry and scientific data.
10. Engage in life learning continuous professional development including post-graduate and research studies.

**And specially, in the networking technologies program, able to:**

1. Think and be creative through the programs offered and free studies included and provided students with research and debriefing skills enabling them to offer appropriate solutions in the field their specialty.
2. Provide students with the basic skills to prepare presentations, negotiate and communicate so they can integrate different labor markets.
3. Use modern methods and tools in the planning, analysis, design and management of computer networks and the Internet.
4. Gain skills in how to program and manage networks and the web and knowledge of the standards of management and operation of computers networks.
5. Identify methods and provide solutions of securing and confidentiality of networks and information.
6. Be Familiar with the ethical and legal standards and responsibilities of a profession.

## Typical Study Plan of NT - program

Prereq. LEVEL 1				Prereq. LEVEL 3			
<b>1<sup>ST</sup> Semester</b>	URM 111	none	Human Rights	<b>1<sup>ST</sup> Semester</b>	CSM 311	CSM224,CSM225	Operating Systems
	URM 112	none	Introduction to Computers +++		ISM 312	BSM214,CSM216	Operations Research (1)
	BSM 113	none	English Language (1)		NTM 313	BSM 222	Computer Networks
	BSM 114	none	Physics		CSM 314	CSM 216	Software Engineering (1)
	BSM 115	none	Fund of Manage & Economics		NTM 315	BSM114 BSM222	Fund. of Fiber Optics
	BSM 116	none	Mathematics (1)		NTE 316	CSM 216	Elective (1)
	CSM 117	none	Introduction to Programming				
<b>2<sup>nd</sup> Semester</b>	URM 121	none	Entrepreneurship & Innovation	<b>2<sup>nd</sup> Semester</b>	URM 321	none	Research Methods & Ethics
	URM 122	none	Marketing & Digital Strategy		NTM 322	NTM 313	Network Automation
	BSM 123	none	Discrete Math & Graph		CSM 323	CSM311, NTM313	Distributed Comp Systems
	BSM 124	none	English Language (2)		NTM 324	CSM225, NTM313	Cyber Security
	BSM 125	none	Digital Systems		NTM 325	NTM 313	Routing & switching
	BSM 126	none	Mathematics (2)		NTE 326	CSM216,CSM223	Elective (2)
	CSM 127	CSM 117	Object Oriented Programming				
LEVEL 2				LEVEL 4			
<b>1<sup>ST</sup> Semester</b>	URM 211	none	Natural Res & Sustainability	<b>1<sup>ST</sup> Semester</b>	ISM 411	ISM226,NTM313	Web App Development
	BSM 212	BSM 114	Electronics		NTM 412	ISM 226, NTM313	Cloud Computing
	BSM 213	BSM 115	Project Management Professional		NTM 413	NTM 325	System Administration (1)
	BSM 214	BSM 126	Probability & Statistics		NTM 414	NTM 325	Wireless System Admin
	CSM 215	BSM 125	Microprocessors		NTE 415	CSM 323	Elective (3)
	CSM 216	123, 127	Data Structures		FRM 416	Article (40)	Project (1)
<b>2<sup>nd</sup> Semester</b>	URM 221	none	Creative & Scientific Thinking	<b>2<sup>nd</sup> Semester</b>	URM 421	none	Communication Skills
	BSM 222	BSM 116	Mathematics (3)		NTM 422	NTM 313	Internet of Things
	CSM 223	CSM 127	Visual Programming		NTM 423	NTM 413	System Administration (2)
	CSM 224	CSM 215	Computer Architecture		NTM 424	NTM 414	Mobile Networks
	CSM 225	CSM 216	Computer Security		NTE 425	NTM 324	Elective (4)
	ISM 226	CSM 216	Database Management Sys. (1)		FRM 426	FRM 416	Project (2)

## Faculty of I.S. & C.S. - Course Map of "Networks Technology Program" Program

Level 1		Level 2		Level 3		Level 4	
Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2
Human Rights (1-Cr)	Entrepreneurship & Innovation (2-Cr)	Natural Res & Sustainability (1-Cr)	Creative & Scientific Thinking (2-Cr)	Operating Systems (3-Cr)	Research Methods & Ethics (2-Cr)	Web App. Develop. (3-Cr)	Comm. Skills (2-Cr)
Introduction to Computers +++ (3-Cr)	Marketing & Digital Strategy (2-Cr)	Electronics (3-Cr)	Mathematics (3) (2-Cr)	Oper. Res. (1) (3-Cr)	Routing & Switching (4-Cr)	Cloud Computing (3-Cr)	Internet of Things (3-Cr)
Physics (3-Cr)	Discrete Mathematics (3-Cr)	Project Manag. Professional (3-Cr)	Visual Prog. (3-Cr)	Comp. Net. (1) (3-Cr)	Dist. Comp. Sys. (3-Cr)	System Administration (1) (3-Cr)	System Administration (2) (3-Cr)
English Lang. (1) (2-Cr)	English Lang. (2) (2-Cr)	Probability & Statistics (3-Cr)	Comp. Architecture (4-Cr)	Software Eng. (1) (3-Cr)	Cybersecurity (3-Cr)	Wireless System Admin (3-Cr)	Mobile Networks (4-Cr)
Fund. of Manage & Economics (3-Cr)	Digital Systems (3-Cr)	Microprocessors (4-Cr)	Computer Security (3-Cr)	Fundamental Of Fiber-Optics (3-Cr)	Network Automation (3-Cr)	Project (1) (3-Cr)	Project (2) (3-Cr)
Mathematics (1) (2-Cr)	Mathematics (2) (2-Cr)	Data Structures (4-Cr)	Database Manag. Sys. (1) (4-Cr)	Elective (1) (3-Cr) Storage Tech. Web hosting Mng. Web Design. Cyber Ethics.	Elective (2) (3-Cr) Image Proc. Multimedia Com. VoIP Engineering. Speech Processing	Elective (3) (3-Cr) Net. Perform. & Eval. Fund. of Data Center Grid Computing.	Elective (4) (3-Cr) Penetration test. Ethical hacking. Digital Forensics.
18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr	18-Cr

University Req.  
9.72% ( 14 Cr)

Faculty Req.  
21.35% ( 31 Cr)

Departmental Compulsory  
60.42% ( 87 Cr)

Departmental Electives  
8.33% ( 12 Cr)

**Total: 144 Cr**



## Network Technologies – Program Typical Study Plan

Level 1												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
First	URM 111	Human Rights حقوق الإنسان	none	1	1	-	-	20	20	-	60	-
	URM 112	Introduction to Computers +++ مقدمة في الحاسبات +++	none	3	2	1	1	20	10	10	40	20
	BSM 113	English Language (1) لغة إنجليزية (١)	none	2	1	2	-	20	10	10	60	-
	BSM 114	Physics فيزياء	none	3	2	1	1	20	10	10	40	20
	BSM 115	Fund of Manage & Economics أساسيات الإدارة والاقتصاد	none	3	3	-	-	20	20	-	60	-
	BSM 116	Mathematics (1) الرياضيات (١): حساب التفاضل والتكامل لعلوم الحاسب	none	2	1.5	1	-	20	10	10	60	-
	CSM 117	Introduction to Programming مقدمة في البرمجة	none	4	2	2	2	20	10	10	40	20
Total				18	12.5	7	4					

Level 1												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 121	Entrepreneurship & Innovation ريادة الأعمال والابتكار	none	2	2	-	-	20	20	-	60	-
	URM 122	Marketing & Digital Strategy التسويق والاستراتيجية الرقمية	none	2	2	-	-	20	20	-	60	-
	BSM 123	Discrete Math & Graph الرياضيات المنفصلة ونظرية الرسم البياني	none	3	2	2	-	20	10	10	60	-
	BSM 124	English Language (2) لغة إنجليزية (٢)	none	2	1	2	-	20	10	10	60	-
	BSM 125	Digital Systems الأنظمة الرقمية	none	3	2	1	1	20	10	10	40	20
	BSM 126	Mathematics (2) الرياضيات (٢): الجبر الخطي والتطبيقات	none	2	1.5	1	-	20	10	10	60	-
	CSM 127	Object Oriented Programming البرمجة الشيئية	CSM 117	4	3	1	1	20	10	10	40	20
Total				18	13.5	7	2					

Students must take in this semester a university requirement elective course from pool URE 12X Arts and Humanities (zero-credit, Pass/Fail)

## Level 2

Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
<b>First</b>	URM 211	Natural Res & Sustainability الموارد الطبيعية والاستدامة	none	1	1	-	-	20	20	-	60	-
	BSM 212	Electronics إلكترونيات	BSM 114	3	2	1	1	20	10	10	40	20
	BSM 213	Project Manage Professional إدارة المشاريع الاحترافية	BSM 115	3	2	1	1	20	10	10	60	-
	BSM 214	Probability & Statistic الاحتمالات والإحصاء	BSM 126	3	2	2	-	20	10	10	60	-
	CSM 215	Microprocessors المعالجات الدقيقة	BSM 125	4	3	1	1	20	10	10	40	20
	CSM 216	Data Structures هياكل البيانات	BSM 123, CSM 127	4	3	1	1	20	10	10	40	20
Total				18	13	6	4					

Level 2												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 221	Creative & Scientific Thinking التفكير الإبداعي والعلمي	none	2	2	-	-	20	20	-	60	-
	BSM 222	Mathematics (3) الرياضيات (٣)	BSM 116	2	1.5	1	-	20	10	10	60	-
	CSM 223	Visual Programming البرمجة المرئية	CSM 127	3	2	1	1	20	10	10	40	20
	CSM 224	Computer Architecture هندسة الحاسب	CSM 215	4	3	1	1	20	10	10	40	20
	CSM 225	Computer Security تأمين الحاسب	CSM 216	3	2	1	1	20	10	10	60	-
	ISM 226	Database Management Systems (1) نظم إدارة قواعد البيانات (١)	CSM 216	4	3	1	1	20	10	10	40	20
Total				18	13.5	5	4					

Students must take - in this semester - a university requirement elective course from pool URE 22X Social Sciences (zero-credit, Pass/Fail)

Level 3												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
First	CSM 311	Operating Systems نظم تشغيل	CSM 224, CSM 225	3	2	-	2	20	10	10	40	20
	ISM 312	Operations Research (1) بحوث عمليات (1)	BSM 214, CSM 216	3	2	1	1	20	10	10	40	20
	NTM 313	Computer Networks شبكات الحاسب	BSM 222	3	2	1	1	20	10	10	40	20
	CSM 314	Software Engineer هندسة البرمجيات	CSM 216	3	2	1	1	20	10	10	40	20
	NTM 315	Fund. of Fiber-Optics أساسيات الألياف الضوئية	BSM 114, BSM 222	3	2	2	-	20	10	10	60	-
	NTE 316	Elective (1) اختياري (1)	CSM 216	3	2	2	-	20	10	10	60	-
Total				18	12	7	5					

### NTE 316 - Networking Technologies Elective (1)

- a- Storage Technologies
- b- Web design
- c Web Hosting management

Level 3												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 321	Research methods & Ethics طرق وأخلاقيات البحث العلمي	none	2	2	-	-	20	20	-	60	-
	NTM 322	Network Automation أتمتة الشبكات	NTM 313	3	2	1	1	20	10	10	40	20
	CSM 323	Distributed Comp. Systems أنظمة الحاسبات الموزعة	CSM 311, NTM 313	3	2	1	1	20	10	10	40	20
	NTM 324	Cybersecurity أمن الشبكات	CSM 225, NTM 313	3	2	1	1	20	10	10	40	20
	NTM 325	Routing and switching التوجيه والتحويل	NTM 313	4	3	-	2	20	10	10	40	20
	NTE 326	Elective (2) (2) اختياري	CSM 216, CSM 223	3	2	1	1	20	10	10	40	20
Total				18	13	4	6					

Students must take - in this semester - a university requirement elective course from pool URE 32X Natural Sciences (zero-credit, Pass/Fail)

**NTE 326 - Networking Technologies Elective (2)**

- a- Image Processing
- b- Multimedia Communication
- c- Voice over IP Engineering

Level 4												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
First	ISM 411	Web Applications Development تطوير تطبيقات الويب	ISM226,NTM313	3	2	-	2	20	20	-	40	20
	NTM 412	Cloud Computing الحوسبة السحابية	ISM226,NTM313	3	2	1	1	20	10	10	40	20
	NTM 413	System Administration (1) إدارة النظام (1)	NTM 325	3	2	1	1	20	10	10	40	20
	NTM 414	Wireless System Administration إدارة النظام اللاسلكي	NTM 325	3	2	1	1	20	10	10	40	20
	NTE 415	Elective (3) اختياري (1)	CSM 323	3	2	1	1	20	10	10	40	20
	FRM 416	Project (1) مشروع (1)	Article (40)	3	2	-	2	20	10	10	40	20
Total				18	12	4	8					

### NTE 415 - Networking Technologies Elective (3)

- a- Network Performance and evaluation
- b- Fundamentals of data center
- c- Grid Computing

Level 4												
Semester	course		Prerequisites	Credit Hours	Teaching Hours			Term -Work Degrees			Final Exam Degrees	
	Code	name			Lecture	Tutorial	Lab	MT Exam	Class Work		Written	Lab
									Lecture	Lab/Tut		
Second	URM 421	Communication Skills مهارات الاتصال	none	2	2	-	-	20	20	-	60	-
	NTM 422	Internet of Things إنترنت الأشياء	NTM 313	3	2	1	1	20	10	10	40	20
	NTM 423	System Administration (2) إدارة النظام (2)	NTM 413	3	2	1	1	20	10	10	40	20
	NTM 424	Mobile Networks شبكات المحمول	NTM 414	4	3	1	1	20	10	10	40	20
	NTE 425	Elective (4) اختياري (4)	NTM 324	3	2	1	1	20	10	10	40	20
	FRM 426	Project (2) مشروع (2)	FRM416	3	2	-	2	20	10	10	40	20
	FRM 429	Field Training التدريب الميداني	none	0	-	-	-	-	-	-	P/F	-
Total				18	13	4	6					

Students must take - in this semester - a university requirement elective course from pool URE 42X Key Skills (zero-credit, Pass/Fail)

**NTE 425 - Networking Technologies Elective (4)**

- a- Ethical hacking
- b- Penetration testing
- d- Digital Forensics





