ARAB OPEN UNIVERSITY

FCS-Student Handbook

July, 2021

Arab Open University

Faculty of Computer Studies

B.Sc. Degree Programme in

Information Technology and Computing (ITC)

ITC Programme
Student Handbook

July, 2021

*The BSc Programme in **Information Technology and Computing** [BSc (Hons) ITC] has been developed and is delivered by the Arab Open University (AOU). It has been validated through a process of external peer review by the Open University (OU), UK.*

Note

Please note that information in this handbook is subject to change and continuous updating. Please check for updates at our website:

http://www.arabou.edu.kw

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Welcome and Introduction

Welcome

We, at the Faculty of Computer Studies (FCS) at Arab Open University (AOU), are delighted to welcome you to study on our BSc (Hons) Information Technology and Computing Degree Programme which offers 8 pathways that includes Information Technology and Computing (ITC), Computer Science (CS), Networking & Security (N&S), Computing with Business (CwB) and Web Development (WD), and introducing 3 new pathways of Artificial Intelligence (AI), Cyber Security (CyS), and Data Science (DS). The AOU is a premier institution of higher education in MENA region and it is currently operating in 9 Arab countries including Kuwait, KSA, Oman, Bahrain, Jordan, Lebanon, Egypt, Sudan and Palestine and AOU headquarters in Kuwait. Students refer to their local country branch administrations for academic and administrative matters related to their local countries.

The AOU uses a Blended Mode of education consisting of at least 25% face to face tutorials and the remaining studies based on Independent Learning. The FCS is one of the major faculties of AOU in operation for the past about 18 years. The FCS offers majority of its programmes of study, including the BSc (Hons) Information Technology and Computing programme in partnership with the Open University (OU), UK. This partnership enables the FCS to offer quality programmes to its students which are well recognized locally as well as internationally. The graduates of this programme are entitled to receive a dual degree at the completion of their studies

The field of Information Technology and Computing is in great demand and you have made a wise decision to study this major. The current significance and importance of the Information Technology and Computing field is a direct result of the industrial revolution, internet, mobile revolution, cloud computing, etc. in recent years. The result of this is the need of Information Technology and Computing graduates with relevant skills.

The graduates of the Information Technology and Computing programme are expected to find jobs and build useful careers in wide variety of sectors in the industry such as Big Data, Cloud Computing, Machine Learning, Security, networks, web development, programming languages, etc. along with building careers in the industry, we will encourage all our graduates to support their local communities by utilizing their skills and expertise to solve problems of the communities or enhancing existing solutions.

Throughout your studies and stay at FCS, it will be emphasized to you to always use ethical practices in life, education and subsequently in your careers. Adoption of ethical practices will aid in the development of respectable and noble personality traits that will be invaluable and priceless to you throughout your life.

At the end we encourage you to put in your best effort and study hard to develop yourself to the best of your potential. We wish you a very fruitful and productive study period at FCS.

Prof. Omar Al Jarrah
Dean, Faculty of Computer Studies

Arab Open University

1. Introduction

Arab Open University is a university running in the MENA area including Kuwait, Saudi Arabia (KSA), Oman, Bahrain, Jordan, Lebanon, Egypt, Palestine and The Sudan with its central Headquarters in Kuwait. The FCS Deanship at the Headquarters provides academic leadership to all 9 branches thus enabling them to act as one university in a unified manner. As an Open Education Institution, AOU adopts the Blended Mode of education, consisting of 25% face-to-face teaching and the remaining consists of independent learning on part of the students. By virtue of operating in 9 branches, offering a number of academic programmes and different requirements of the local accreditation bodies, the AOU's academic organization represents great deal of challenges and complexities.

The Faculty of Computer Studies (FCS) at AOU offers B.Sc. - an Undergraduate Programme in Information Technology and Computing (ITC) with a core of 360 Points (96 Credit Hours). The Bachelor of Science in Information Technology and Computing has five pathways in addition to 3 new pathways, designed to meet the needs of the modern society and the labour market. The students who are applying to the Programme will have the option to choose one of the following eight pathways:

- Information Technology and Computing (ITC)
- Computer Science (CS)
- Network & Security (N&S)
- Web Development (WD)
- Computing with Business (CwB)
- Artificial Intelligence (AI)
- Cyber Security (CyS)
- Data Science (DS)

Partnership with OU, UK

Our graduates will be awarded two Hons degrees: one from the Open University, UK and the other one from AOU through one of our 9 local branches; Kuwait, Kingdom of Saudi Arabia, Bahrain, Egypt, Jordan, Lebanon, Oman, Palestine, and The Sudan.

Enhancing the student experience is one of the main objectives of FCS. Therefore, the student will be equipped with practical and soft skills in addition to the ethical practices in order to be ready for the real world as well as the Labour market.

Why ITC?

According to the World Economic Forum Report entitled "The Future of Jobs Report" which is published in October 2020 (refer to http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf), Information Technology and Computing is expected to have a great role in the industrial revolution. For instance, Mobile, Internet and Cloud Technology, Advances in Computing Power and Big Data, Internet of things, Advanced Robotics and Autonomous Transport and Artificial Intelligence are rated as top trend between 2015-2020.

Our Information Technology and Computing Programme provides a strong theoretical infrastructure, along with deep technical focus to ensure that graduates have the right combination of theoretical background and technical ability. This unique combination of theoretical knowledge and technical capabilities are equipped to enjoy significant rewards in the world's most challenging industry. Our Deanship and the corresponding departments in AOU operating campuses have an excellent network of contacts within industry to ensure smooth transition from university into labour market.

Studying ITC will enable the students to face the future and find jobs in the challenging labour market. In addition, ITC Programme offered by AOU-FCS has an edge over the programmes offered by others in providing students with skills to succeed both in the traditional professions as well as in their ITC based business/entrepreneurship.

The ITC programme provides its graduates with the top and the most in-demand skills around the globe, including:

- Possess a strong background in Operating Systems (OS) and Server OS.
- Advanced knowledge of a wide range of computer systems software, applications, hardware, networking, and communications.
- Ability to diagnose and rectify a wide range of complex computer hardware and software problems.
- Ability to effectively supervise staff.
- Ability to communicate effectively, both orally and in writing.
- Ability to provide advanced technical assistance and comprehensive problem resolution to end users.
- Ability to install and configure computer systems, hardware, and peripherals.
- Knowledge of customer service standards and procedures.
- Strong interpersonal and communication skills and the ability to work effectively in a diverse community

2. Academic Calendar

The FCS follows the general academic calendar of the AOU, which consists of two main academic semesters (Fall and Spring), each consists of 16 weeks, and additional (optional) summer semester of 10 weeks. The student can successfully complete his/her study within a period of average 4 year. However, this duration can be shortened to 3.5 years if the student register in the Summer semesters. It is important to note that for the main semesters (i.e., Fall and Spring), min (8) /max (21) credit hours should be registered by the student, and hence the overall study period may be expanded or compressed according to the student capability. With respect to the optional Summer semester, the student can only register up to 12 credit hours. It also worth to mention that all the modules are continuously available in each semester. The Fall Academic Semester usually starts in October and ends in February whereas the Spring Academic Semester runs from March till July. The Summer Semester usually runs from July till September. The assessment

dates are clearly listed in the Academic Calendar. Each module calendar is based on the Academic Calendar of the AOU. A representative Academic Calendar is given in link:

https://www.arabou.edu.kw/students/pages/academic-calendar.aspx

3. Teaching and Learning Methodology

Knowledge and understanding are acquired from specially prepared teaching texts for majority of modules, supported by self-assessment and in-text questions, reference texts, multi-media packages, directed reading, computer mediated conferencing, web-based resources, and video and audio recordings. Students work independently with the teaching materials but they are encouraged to form self-help groups with other students, communicating face-to-face, by telephone, email and computer conferencing and through the Learning Management System (LMS). All modules are delivered based on a blended learning model, which consist of 25% face-to-face and 75% is self-learning. The 25% face-to-face consist of 2 hours per week for 8 CHs module, and 2 hours biweekly for the 4 and 3 CHs modules or based on local regulations of MoHE, in addition to one office hour per 2 taught hours. On the other hand, the 75% self-learning depends on the students' self-study based on the teaching materials uploaded on the Central-LMS. Such materials are mainly PowerPoint slides, lectures note, activities, and other e-resources. More details about Learning and Teaching Strategy at AOU is available in the following link https://www.arabou.edu.kw/blended-learning/Pages/about.aspx

4. List of Programme Director and Academic Staff, Their Contact Details and Availability Arrangements

The programme team leaders for the B.Sc. in Information Technology and Computing are Dr. Ahmed Gawish, and Dr. Hamayun Khan, both are the General Programme Coordinators (GPC), under full supervision of the Dean of FCS, Prof. Omar Al-Jarrah (dean.it@arabou.edu.kw). The lists of programme director at the AOU Headquarters and academic staff at the branches are available electronically on the AOU's website at https://www.arabou.edu.kw/Pages/default.aspx**.** The academic staff at the

FCS is available to you during the 25% face-to-face tutorial sessions and also during the office hours.

5. List of Support Staff (Technical and Administrative)

Support staff at the Headquarters and at the branches are ready to support you in your studies. Their contact details are available at branch websites https://www.arabou.edu.kw/Pages/default.aspx.

6. Details of External Examiners

AOU assessment strategy is based on general principles and procedures aiming to organize and monitor the examinations at all AOU branches. AOU regulations include validation (pre-assessment moderation) of examination questions and answer keys by external examiners (EE), audit tutors' marking, post-assessment moderation; and 4 tiers of examination committees.

Table 6.1 provides a brief about the external examiners (EEs) at the Faculty of Computer Studies (FCS).

Table 6.1 Summary of External Examiners

Name	Position	Institution
Prof. Alistair Duffy (Chief External Examiner)	Professor of Electromagnetics, Faculty Head of Research and Innovation	De Montfort University, The Gateway, Leicester.
Prof. Ahmed Al-Dubai (External Examiner)	Professor in the School of Computing	Edinburgh Napier University, UK
Dr. Rahat Iqbal (External Examiner)	Senior academic- Associate Professor	Coventry University, UK
Dr. Tariq Abdullah (External Examiner)	Academic lead Computing and IT and research fellow	University of Derby, UK
Dr. Salem Al-Jareh (External Examiner)	Senior Lecturer	University of Portsmouth, UK

7. Introduction to the Programme

The Faculty of Computer Studies (FCS) started offering the Information Technology and Computing (ITC) Programme since the establishment of the Arab Open University (AOU) in the year 2002. This programme was initially offered at 3 AOU Campuses (Kuwait, Lebanon and Jordan). Soon after, it was offered in 3 more campuses to include Egypt, Saudi Arabia and Bahrain. Oman was the next country campus to offer the ITC Programme of study in 2008, followed by Sudan in 2014 and finally, the campus of West Bank. The ITC Programme at FCS was validated by the OUVS in the year 2003. Then, the programme was successfully revalidated in 2007 with major updates in its modules along with the introduction of four pathways, including Information Technology and Computing (ITC), Information and Communication Technology (ICT), Computing (C), and Computing with Business (CWB). From the four (4) pathways, the ITC pathway of study has attracted majority of student enrolments. The ITC Programme was successfully revalidated once again in 2012 with major updates in the programme, keeping same pathways, The ITC programme was revalidated successfully in 2017 with major updates resulting in increasing the pathways to 5 i.e. Information Technology & Computing (ITC), Computer Science (CS), Networking & Security (NS), Web Development (WD) and Computing with Business (CwB). Recently, further researches have been conducted to study the needs of IT Market, which led to adopt 3 new pathways; Artificial Intelligence (AI), Cyber Security (CyS), and Data Science (DS);

the regular 5 years revalidation was due in 2022 but due to the introduction of the 3 new pathways we are going for an early Revalidation.

Philosophy:

Throughout the life of the ITC Programme in AOU, the deanship philosophy of running the programme is to keep it up-to-date with the latest technical advancements, satisfying the relevant market/employer needs. In addition, the AOU in general is keen to keep its programmes revalidated from the OU, UK and to provide our students with extra international recognition to maximize their employability possibilities. The FCS Deanship is also working towards

obtaining international recognition for its ITC programme across the AOU Campuses; for example, Kuwait campus has obtained its first international accreditation from the Institution of Engineering and Technology (IET). Finally, the FCS is working to help its students to not only seek regular jobs, but also to build their capabilities and skills to be ready for entrepreneurship, as most of the AOU operating countries exhibit high readiness for entrepreneurship.

7.1 ITC Programme Pathways

- **Information Technology and Computing (ITC)**

Students will acquire knowledge and key skills about important topics in the field of ITC, including Communication and Information Technologies, Object Oriented Programming, Software Engineering, Data Management and Analysis.

- **Computer Science (CS)**

Through the study of this pathway, the students will gain in depth knowledge about the key Computer Science areas such as Object-Oriented Programming, Data Structures and Algorithms, Operating Systems, Computer Graphics and Multimedia, Data Management and Analysis, Changing Work Environments and Flexible working arrangements and Artificial Intelligence.

- **Network & Security (N&S)**

This pathway provides students with opportunities to study specialized topics related to Networks and Security, including studying of CISCO Networking, Advanced Networking, Applied Network Security, Communication Technology and Changing Work Environments and Flexible working arrangements.

- **Web Development (WD)**

This important pathway enables students to undertake study of specialized topics related to Web Development including, Changing Work Environments and Flexible working arrangements, Object-Oriented Programming, Web Technologies, Algorithms and Data Structures, Mobile and Cloud Technologies and Interaction Design and User Experience.

- **Computing with Business (CwB)**

This pathway is a good blend of Computing and Business concepts. Students will acquire knowledge about important topics, including Object-Oriented Programming, Data Management and Analysis, Web Mobile and Cloud Technologies, Business Opportunities and Strategic Management.

- **Artificial Intelligence (AI)**

The aim of the pathway is to provide the student with a rigorous foundation of Artificial Intelligence, tools and applications that an Artificial Intelligence expert needs. Further, it prepares students for a variety of in-demand information technology careers, dedicated to professional working in software. The aim of the AI pathway is to equip the student with the knowledge and skills s/he will need to take part in AI-software related industry

- **Data Science (DS)**

Data Science has been hailed as the topmost profession 21st Century. And so, FCS adopted DS pathway because data has a massive exponential increase, and so, it is considered as the fuel that drives industries. Now Big Data has revolutionized companies and has given them an edge in competition. Data Science pathway enables students to handle, manage, analyse and understand trends in data which is a requirement of profession in reputable companies.

- **Cyber Security (CyS)**

The aim of the CyS pathway is to provide the student with a rigorous foundation of cyber security, tools and applications that a Cyber-Security expert needs. Further, it prepares students for a variety of in-demand information technology careers, dedicated to securing vulnerable data and information and stopping cyberattacks in the digital environment. Further, it engages students in the challenges and problems associated with assuring information, confidentiality and integrity (e.g., social, economic, technology-related, and policy issues), as well as the strengths and weaknesses of various methods for assessing and mitigating associated risk.

7.2 Graphical Presentation of the Programme

Table 7.1 below shows the composition of the programme Pathways, including the different levels of modules along with their classification.

Table 7.1. Programme Structure of all pathways of ITC Programme

	ITC	CS	N&S	WD	AI	CyS	DS	CwB
Level 0	University Requirements (All Pathways)							
Level 1 (AOU) = Level 4 (OU)	Faculty Requirements (All Pathways)							
	MST129 – Applied Calculus (4 CHs)							
	Specialization/Core Requirements							
	MT131 Discrete Mathematics (4 CHs)				MT132 Linear Algebra (4 CHs)		M110 Python Programming (8 CHs)	
	TM103 Computer Organization and Architecture (4 CHs)	TM103 Computer Organization and Architecture (4 CHs)	TM103 Computer Organization and Architecture (4 CHs)	TM103 Computer Organization and Architecture (4 CHs)	TM103 Computer Organization and Architecture (4 CHs)	TM129 Technologies in practice (8 CHs)	M140 Introducing to Statistics (8 CHs)	TM103 Computer Organization and Architecture (4 CHs)
	TM105 Introduction to Programming (4 CHs)	TM105 Introduction to Programming (4 CHs)	TM105 Introduction to Programming (4 CHs)	TM105 Introduction to Programming (4 CHs)	MT141 Introduction to Probability and Statistics (4 CHs)			TM105 Introduction to Programming (4 CHs)
	TM112 Introduction to Computing and Information Technology (8 CHs)	TM112 Introduction to Computing and Information Technology (8 CHs)	TM112 Introduction to Computing and Information Technology (8 CHs)	TM112 Introduction to Computing and Information Technology (8 CHs)	TM112 Introduction to Computing and Information Technology (8 CHs)	TM112 Introduction to Computing and Information Technology (8 CHs)	TM112 Introduction to Computing and Information Technology (8 CHs)	BUS110 Introduction to Business (8 CHs)
	Electives							
	Student can select from variety of elective modules							
Level 2 (AOU) = Level 5 (OU)	Faculty Requirements (All Pathways)							
	TM260 - Ethics, Law and the Governance in IT (8 CHs)							
	Specialization/Core Requirements							
	M251 Object-Oriented Programming using Java (8 CHs)	M251 Object-Oriented Programming using Java (8 CHs)	T216A Cisco Networking (CCNA)-A (8 CHs)	M251 Object-Oriented Programming using Java (8 CHs)	TM275 Parallel and Distributed Systems (4 CHs)	T216A Cisco Networking (CCNA)-A (8 CHs)	MT248 Analysing Data (4 CHs)	M251 Object-Oriented Programming using Java (8 CHs)

M269 Algorithms, Data Structures and Computability (8 CHs)	M269 Algorithms, Data Structures and Computability (8 CHs)	T216B Cisco Networking (CCNA)-B (8 CHs)	TM254 Managing IT: the why, the what and the how (8 CHs)	M269 Algorithms, Data Structures and Computability (8 CHs)	T216B Cisco Networking (CCNA)-B (8 CHs)	M269 Algorithms, Data Structures and Computability (8 CHs)	TM254 Managing IT: the why, the what and the how (8 CHs)
TM255 Communication and Information Technologies (8 CHs)	TT284 Web Technologies (8 CHs)	TM254 Managing IT: the why, the what and the how (8 CHs)	M252 Internet Programming (8 CHs)	TM270 Artificial intelligence (8 CHs)	TT284 Web Technologies (8 CHs)	MST224 Mathematical Methods (8 CHs)	B207A Shaping Business Opportunities-A (8 CHs)
T215B Communication and Information Technology B (8 CHs)	TM298 Operating Systems (4 CHs)	M251 Object-Oriented Programming using Java (8 CHs)	TT284 Web Technologies (8 CHs)	TM271 Machine Learning and Deep learning (8 CHs)	TM256 Cyber Security (8 CHs)	MT249 Practical Modern Statistics (4 CHs)	B207B Shaping Business Opportunities-B (8 CHs)
	TM240 Computer Graphics and Multimedia (4 CHs)			TM276 Software Development Processes and Methodologies (4 CHs)		M218 Relational Databases (4 CHs)	
						M238 Data Visualization (4 CHs)	
Elective Requirements							
Student can select from variety of elective modules							
Specialization/Core Requirements							
TM351 Data Management and Analysis (8 CHs)	TM351 Data Management and Analysis (8CHs)	T316 Advanced Networking (8 CHs)	TM352 Web, Mobile and Cloud Technologies (8 CHs)	TM340 Natural Language Processing (8 CHs)	TM311 Information security (8 CHs)	TM351 Data Management and Analysis (8 CHs)	TM351 Data Management and Analysis (8 CHs)
TM354 Software Engineering (8 CHs)	TM354 Software Engineering (8 CHs)	T318 Applied Network Security (8 CHs)	TM354 Software Engineering (8 CHs)	TM341 Computer Vision (8 CHs)	T318 Applied Network Security (8 CHs)	M348 Applied statistical modelling (8 CHs)	TM354 Software Engineering (8 CHs)
TM355 Communications Technology (8 CHs)	TM358 Machine learning and artificial intelligence (8 CHs)	T321 Operating System Server Administration (8 CHs)	TM356 Interaction Design and User Experience (8 CHs)	TM351 Data Management and Analysis (8CHs)	TM359 System penetration testing (8 CHs)	TM358 Machine learning and artificial intelligence (8 CHs)	BUS310 Strategic Management (8 CHs)
TM471 Graduation Project (ITC pathway) (8 CHs)	TM471 Graduation Project (CS pathway) (8 CHs)	TM471 Graduation Project (NS pathway) (8 CHs)	TM471 Graduation Project (WD pathway) (8 CHs)	TM471 Graduation Project (AI pathway) (8 CHs)	TM471 Graduation Project (CyS pathway) (8 CHs)	TM471 Graduation Project (DS pathway) (8 CHs)	TM471 Graduation Project (CwB pathway) (8 CHs)
Electives							
Student can select from variety of elective modules							

The level label for the lower section is: **Level 3 (AOU) = Level 6 (OU)**

Selecting the Pathway

Every pathway covers a list of core modules that define its identity. However, there are many common modules across all pathways. In level one, the students have the chance to select and think about their future pathway that suite their ambitious and plans. In case they are not able to select properly, the students are recommended to ask for advice and guide from their tutor and personal academic advisors. In addition, they are recommended to register for TM112, which is mainly designed to cover a wide spectrum of technologies, to give a glance of each pathway. Then, the students will be more confident to select.

Changing the Pathway

In case any student wants to change his/her pathway at any stage of his/her study, s/he must study the missing core modules of the newly selected pathway without being requested to start from the beginning. The core modules of each pathway are illustrated in the table 7.1.

Attendance Requirements

The FCS follows the hybrid model of open education (Blended Learning) at AOU which requires 25% face-to-face tutorial attendance in a classroom environment. The 25% face-to-face tutorial sessions are mandatory and if student fails to attend 3 consecutive tutorial sessions without due, causes student to be suspended from the module and student needs to retake the module. The 25% face-to-face tutorial sessions are clearly marked in individual module calendar using the following guidelines in table 7.2:

Table 7.2. Attendance Requirements

Number of Credit Hours	Points	No. Hours/Tutorial Sessions
3	10	1 hour tutorial every week
4	15	1 hour tutorial every week
8	30	2 hours tutorial every week
16	60	4 hours tutorial every week

Opportunities Available to Students on Completion of the Programme (Employment, Further Academic Study, etc.).

On successful completion of the B.Sc. degree, graduate student will be able to get employment opportunities in both the Middle Eastern (ME) markets and the international markets since this B.Sc. programme would be validated by the OUVP. This degree opens up the world of technology and an array of exciting careers in a wide range of sectors for student.

The B.Sc. degree helps graduate student to become a dominant player in the field of Information Technologies and Computing; to analyse, develop, test, maintain, integrate and use hardware and/or software or hybrid systems; to participate in innovating new solutions to meet specific market or organisation needs. A choice of pathways through the degree will enable student to concentrate student's studies on Information Technologies and Computing, Computer Science, Web Development, Networking & Security, Computing with Business, Artificial Intelligence, or Data Science. Some of the key areas where graduate students can find employment opportunities include the following:

Pathway	Job Opportunities	
ITC	• System modelling, analysis, development and integration, including hardware, software and web-based systems • Cloud Computing Engineer • Computer Network Specialist • Computer Support Specialist • Database Administrator	• Mobile Technology • Software Designer/Developer Storage Management • Information Technology Analyst • Information Technology Leadership • Information Security Specialist Software/Application Developer
CS	• Software Developer • Computer Systems Analyst • Web Developer • Software quality assurance manager • Data analyst	• Database Administrator • Computer Hardware Engineer • Information Security Analyst • Computer and Information Research Scientists/ Systems Managers • Full stack developer
N&S	• Security Analyst • Security Engineer • Security Architect • Security Administrator • Security Software Developer • Cryptographer	• Network technical architects • Network technicians • Network principals • Network administrators • Cryptanalyst • Network and Security Consultant
WD	• Applications developer • Game developer	• database designer • digital marketing

	• Multimedia programmer • Web content manager • web application developer • website designer	• graphics designer • multimedia production • programmer • software developer
CwB	• Software Developer • Applications Programmer • Systems Programmer • Multimedia Programmer	• Systems Analyst • Computer Sales Support • Database Administrator • IT Technical Support Officer
CyS	• Network designer • IT Network Security • Cyber Security Analyst • Cyber Security Consultant • Penetration & vulnerability tester • Cyber security manager/ administrator • Cyber security architect • Security Auditor	• Penetration Tester • Computer Forensics Investigator • Cryptographer • Cyber Security Risk Analyst • Cyber Software Developer • Chief Security Officer • Ethical Hacker • Threat Manager /Responder • Network Administrator
AI	• Applications Developer • AI Data Analyst/Engineer • Applied Machine Learning Engineer • Big Data Engineer/Architect • Business Intelligence Developer • Cloud Computing Engineer • Computational Linguist • Computer vision engineer • Security Analyst Engineer	• Designer in Human-Cantered Machine Learning • Embedded Machine Learning Engineer • Machine Learning Operations (MLOps) Developer • Machine Learning Researcher • Data Scientist • Research Scientist • Robotics Scientist
DS	• Data analyst • Data engineer • Data scientist • Machine learning engineer • Machine learning scientist • Applications architect • Enterprise architect • Data architect • Infrastructure architect • Business Intelligence (BI) developer • Statistician, • Business analyst- data science • Senior associate - data scientist • Health informatics	• Senior data scientist • Python developer (data scientist) • R developer (data scientist) • System modelling, analysis • development and integration, including hardware, software and web-based systems • Software industry • Network design, development and maintenance • Storage management • Big data analytics • Web development, internet of things, cloud technologies, • Financial sector including banking

On successful completion of the ITC programme, the students will be eligible to conduct postgraduate study in Computing (MSc. in Computing) (2

Pathways: Software Development or Information Security and Forensics) currently offered in AOU Lebanon campus.

8. Programme Specification

Programme Core Modules matrix displaying the 8 pathways of the ITC Program and the associated modules is presented below. The programme consists of 360 points of the Core Modules of study for each pathway. Most pathways share common modules at the Level-1 stage of study. However, each pathway has more specialized modules at the higher Level-2 and Level-3 stages. All pathways require students to complete the project module TM471 in order to successfully complete the ITC programme of study. The project module TM471 includes the completion of an extensive piece of practical project, which has to be completed on an individual basis.

The 96 Credit Hours core modules are placed in sub-section-3 for validation. Students seeking a BSc Honours degree in Information Technology and Computing (ITC) at AOU must complete at least 131 credit hours including the 96 CHs core modules and 35 AOU requirements.

1. Overall AI Programme Requirements (AOU) (Table-8.1)
2. General University requirements (Table-8.2)
3. Faculty compulsory Requirements (Table-8.3)
4. Faculty elective requirements (Table-8.4)
5. Faculty core requirements (Table-8.5)
6. Details of Specialization/Core Requirements (Table- 8.6)

Programme Requirements (131 CHs)

Table 8.1: Programme Requirements

Requirement type	Credit Hours
University Requirements/ Mandatory	18
University Requirements/ Electives	3
Faculty Requirements/ Mandatory	8
Faculty Requirements/ Electives	6
Specialization Requirements/ Mandatory	96
Total Credit Hours	131

The details of the previous requirements will be described as follows:

University Requirements/ Mandatory (60 points) (18 Credit Hours)

Table 8.2: Details of University Requirements (Mandatory)

Module	Module Title	Credit	Pre-requisites
AR113	Arabic Communication Skills	3	--
GB102	Principles of Entrepreneurship for	3	--
GR118	Life Skills and Coexistence	3	--
GT101	Learning and Information	3	--
EL111	English Communication Skills I	3	EL099
EL112	English Communication Skills II	3	EL111
Total		18	

The list of modules and/or the modules contents may be updated/replaced as per AOU university council decision or local accreditation requirements.

University Requirements/ Electives (10 points) (3 Credit Hours)

Table 8.3: Details of University Requirements (Electives)

Module Code	Module Title	Credit Hours	Pre-requisites
GR111	Arabic Islamic Civilization	3	--
GR112	Issues and Problems of Development in the	3	--
GR115	Current International Issues and Problems	3	--
GR116	Youth Empowerment	3	--
GR117	Women Empowerment	3	--
GR121	Environment and Health	3	--
GR131	General Branch Requirement	3	--
CH101	Chinese for Beginners (I)	3	--
CH102	Chinese for Beginners (II)	3	CH101
SL101	Spanish for Beginners (I)	3	--
SL102	Spanish for Beginners (II)	3	SL101
FR101	French for Beginners (I)	3	--
FR102	French for Beginners (II)	3	FR101

The list of modules and/or the modules contents may be updated/replaced as per AOU university council decision or local accreditation requirements.

Faculty Requirements / Mandatory (30 points) (8 Credit Hours)

Table 8.4: Details of Faculty Requirements (Mandatory)

1. + the pre-requisite can be registered in parallel

Module code	Module title	Credit Hours	Points	Source	Pre-requisites
MST129	Applied Calculus	4	15	AOU	EL099
TM260*	Ethics, Law and the Governance in IT	4	15	AOU	As per the pathway+

2. *The TM260 may be replaced by an applied module as per the local accreditation requirement.

Faculty Requirements / Elective (20 points) (6 Credit Hours)

Table 8.5: Details of Faculty Requirements (Electives)

code	Module title	ITC	CS	N&S	WD	CwB	CyS	DS	AI	Pre-requisites
Level 1 (AOU) = Level 4 (OU)									
MS102	Physics	✓	✓	✓	✓	✓	✓	✓	✓	EL111
M109	.NET Programming	✓	✓	✓	✓	✓	✓	✓	✓	EL111
MT101	General Mathematics	✓	✓	✓	✓	✓	✓	✓		-
M115*	Python for ML and DS							✓		M110
Level 2 (AOU) = Level 5 (OU)									
TM297	Compression Methods for Multimedia	✓								TM112 & MT131
M277	Competitive Programming	✓	✓							M251 & (M269)+
TM295	System Modelling		✓							MT132
TM290	Cryptography and Internet Security			✓			✓			TM112
TM287	Web Applications Development				✓					TM105
TM291	Management Information Systems					✓				BUS110 & TM105
TM280	Smart IoT Systems								✓	TM112
Level 3 (AOU) = Level 6 (OU)									
MT390	Image Processing	✓								MT132 & M251
MT372	Parallel Computing		✓							M269 & M251
MT395*	Applied Cyber Security			✓			✓			TM260
MT380	Service Oriented Architecture				✓					M251
TM391	E-Commerce					✓				B207B & M251
TM338	Data Mining							✓		MT249
TM339	Big Data Analytics							✓		MT249
TM380	Autonomous Robotic System								✓	TM271

( )+ can be registered in parallel.
- The Data Science Students are highly recommended to study M115 as an elective module
- The Cyber Security Students are highly recommended to study MT395 as an elective module
- MT395* can be an elective module for the all tracks based on advising.
- *Note- The student will not be allowed to take more than one elective module per level from the above Table-8.5, according to proper Academic Advising. Core modules of any pathway might serve as Elective modules for other pathways, according to proper Academic Advising.*

Specialisation/ Core Requirements (96 Credit Hours)

The students will be encouraged to finish each level before moving on to the next level. The details of core modules are given as follows:

Table 8.6 Programme Plan of All Pathways of ITC

Level 1 (AOU) = Level 4 (OU)													
Code	Module title	Source	Point	CHs	ITC	CS	N&S	WD	CwB	CyS	DS	AI	Pre-Requisite
TM103	Computer Organization and Architecture	AOU	15	4	✓	✓	✓	✓	✓			✓	EL111
TM105	Introduction to Programming	AOU	15	4	✓	✓	✓	✓	✓				EL111
MT131	Discrete Mathematics	AOU	15	4	✓	✓	✓	✓	✓	✓	✓	✓	EL111
MT132	Linear Algebra	AOU	15	4	✓	✓	✓	✓	✓	✓	✓	✓	EL111
M110	Python Programming	AOU	30	8	✓	✓	✓	✓	✓	✓	✓	✓	EL111
TM112	Introduction to Computing and Information Technology	OU	30	8	✓	✓	✓	✓		✓	✓	✓	M110
BUS110	Introduction to Business	AOU	30	8					✓				EL111
TM129	Technologies in Practice	OU	30	8						✓			M110
M140	Introducing Statistics	OU	30	8							✓		EL111
MT141	Introduction to Probability and Statistics	AOU	15	4								✓	EL111
					120	120	120	120	120	120	120	120	

Level 2 (AOU) = Level 5 (OU)													
Code	Module title	Source	Point	CHs	ITC	CS	N&S	WD	CwB	CyS	DS	AI	Pre-Requisite
B207A	Shaping Business Opportunities-A	OU	30	8					✓				BUS110
B207B	Shaping Business Opportunities -B	OU	30	8					✓				B207A
T216A	Cisco Networking (CCNA)-A	OU	30	8			✓			✓			TM112
T216B	Cisco Networking (CCNA)-B	OU	30	8			✓			✓			T216A
M251	Object-Oriented Programming using Java	AOU	30	8	✓	✓	✓	✓	✓				TM105
M269	Algorithms, Data Structures and Computability	OU	30	8	✓	✓					✓	✓	M110 & MT131
TT284	Web Technologies	OU	30	8			✓	✓		✓			TM112
TM298	Operating Systems	AOU	15	4	✓								TM105 & TM103
TM240	Computer Graphics and Multimedia	AOU	15	4	✓								MT132 & TM105
TM255	Communication and Information Technologies	OU	30	8	✓								TM112

Code	Module title	Source	Point	CHs	ITC	CS	N&S	WD	CwB	CyS	DS	AI	Pre-Requisite
TM254	Managing IT: the why, the what and the how	OU	30	8			✓	✓	✓				M110
MT248	Analysing data	OU	15	4							✓		M140
MST224	Mathematical methods	OU	30	8							✓		MST129 & MT132
MT249	Practical modern statistics	OU	15	4							✓		MT248
TM256	Cyber Security	OU	30	8						✓			TM129
T215B	Communication and Information Technologies – Part B	OU	30	8	✓								TM255
TM275	Parallel and Distributed Systems	AOU	15	4								✓	TM103
TM270	Artificial intelligence	AOU	30	8								✓	TM112 & MT141
TM271	Machine Learning and Deep learning	AOU	30	8								✓	TM270 & MT141
TM276	Software Development Processes and Methodologies	AOU	15	4								✓	TM112
M252	Internet Programming	AOU	30	8				✓					TM112
M218	Relational Databases	AOU	15	4							✓		M110 & MT131
M238	Data Visualization	AOU	15	4							✓		M110
					120	120	120	120	120	120	120	120	

Level 3 (AOU) = Level 6 (OU)													
Code	Module title	Source	Point	CHs	ITC	CS	N&S	WD	CwB	CyS	DS	AI	Pre-Requisite
BUS310	Strategic Management	AOU	30	8					✓				B207B
T316	Advanced Networking	AOU	30	8			✓						T216B
T318	Applied Network Security	AOU	30	8			✓			✓			T216B
TM351	Data Management and Analysis	OU	30	8	✓	✓			✓		✓	✓	M269 or M251*
TM352	Web, Mobile and Cloud Technologies	OU	30	8				✓					TT284 or M251*
TM354	Software Engineering	OU	30	8	✓	✓		✓	✓				M251
TM355	Communications Technology	OU	30	8	✓								T215B
TM356	Interaction Design and User Experience	OU	30	8				✓					TT284

Code	Name	OU/AOU	Points	Level	1	2	3	4	5	6	7	8	Pre-requisite
TM311	Information security	OU	30	8						✓			**T216A**
TM359	System penetration testing	OU	30	8						✓			**TM256**
M348	Applied statistical modelling	OU	30	8							✓		**MT248**
TM358	Machine learning and artificial intelligence	OU	30	8		✓					✓		**M269**
TM340	Natural Language Processing	AOU	30	8								✓	**TM271**
TM341	Computer Vision	AOU	30	8								✓	**TM271**
T321	Operating System Server Administration	AOU	30	8			✓						**T216A**
TM471	Graduation Project (ITC pathway)	AOU	30	8	✓								**TM355 or TM354 or TM351****
TM471	Graduation Project (CS pathway)	AOU	30	8		✓							**TM354 or TM358 or TM351****
TM471	Graduation Project (NS pathway)	AOU	30	8			✓						**T316 or T318 or T321****
TM471	Graduation Project (WD pathway)	AOU	30	8				✓					**TM352 or TM354 or TM356****
TM471	Graduation Project (CwB pathway)	AOU	30	8					✓				**(TM351 & BUS310) or (TM354 & BUS310**)**
TM471	Graduation Project (CyS pathway)	AOU	30	8						✓			**TM311 or TM359 or T318****
TM471	Graduation Project (DS pathway)	AOU	30	8							✓		**M348 or TM358 or TM351****
TM471	Graduation Project (AI pathway)	AOU	30	8								✓	**TM351 or TM340* or TM341****
					120	**120**	**120**	**120**	**120**	**120**	**120**	**120**	
	Total Number of Points per Pathway				**360**	**360**	**360**	**360**	**360**	**360**	**360**	**360**	

* Based on selected pathway

** Based on advising

ITC Programme - Recommended Study Plans

- ITC Programme's Pathways - Study Plan

The academic year at AOU consists of two main academic semesters (Fall and Spring), each consists of 16 weeks, and additional (optional) summer semester of 10 weeks. The following structure plan is a suggested plan based on Fall and Spring semesters.

- **Information Technology and Computing Pathway –Recommended Study Plan**

<table>
<tr><td colspan="5" align="center">First Year</td></tr>
<tr><td>Semester</td><td>Modules</td><td>Title</td><td>Credit Hours</td><td>Prerequisite</td></tr>
<tr><td rowspan="4">1st
(13 CHs)</td><td>EL111</td><td>English Communication Skills I</td><td>3</td><td>EL099</td></tr>
<tr><td>GR118</td><td>Life Skills and Coexistence</td><td>3</td><td>-</td></tr>
<tr><td>GT101</td><td>Computing Essentials</td><td>3</td><td>-</td></tr>
<tr><td>MST129</td><td>Applied Calculus</td><td>4</td><td>EL099</td></tr>
<tr><td rowspan="4">2nd
(14 CHs)</td><td>AR113</td><td>Arabic Communication Skills</td><td>3</td><td>-</td></tr>
<tr><td>EL112</td><td>English Communication Skills II</td><td>3</td><td>EL111</td></tr>
<tr><td>MT131</td><td>Discrete Mathematics</td><td>4</td><td>EL111</td></tr>
<tr><td>MT132</td><td>Linear Algebra</td><td>4</td><td>EL111</td></tr>
<tr><td colspan="5" align="center">Second Year</td></tr>
<tr><td>Semester</td><td>Modules</td><td>Title</td><td>Credit Hours</td><td>Prerequisite</td></tr>
<tr><td rowspan="3">1st
(14 CHs)</td><td>GB102</td><td>Principles of Entrepreneurship for Non-Specialists</td><td>3</td><td>-</td></tr>
<tr><td>M110</td><td>Python Programming</td><td>8</td><td>EL111</td></tr>
<tr><td></td><td>A module from University Requirement/Elective</td><td>3</td><td>-</td></tr>
<tr><td rowspan="4">2nd
(19 CHs)</td><td>TM112</td><td>Introduction to Computing and Information Technology</td><td>8</td><td>M110</td></tr>
<tr><td>TM105</td><td>Introduction to Programming</td><td>4</td><td>EL111</td></tr>
<tr><td>TM103</td><td>Computer Organization and Architecture</td><td>4</td><td>EL111</td></tr>
<tr><td></td><td>Faculty Elective</td><td>3</td><td></td></tr>
<tr><td colspan="5" align="center">Third Year</td></tr>
<tr><td>Semester</td><td>Modules</td><td>Title</td><td>Credit Hours</td><td>Prerequisite</td></tr>
<tr><td rowspan="2">1st
(16 CHs)</td><td>M251</td><td>Object-Oriented Programming using Java</td><td>8</td><td>TM105</td></tr>
<tr><td>TM255</td><td>Communication and Information Technologies</td><td>8</td><td>TM112</td></tr>
<tr><td rowspan="3">2nd
(20 CHs)</td><td>M269</td><td>Algorithms, Data Structures and Computability</td><td>8</td><td>M110 & MT131</td></tr>
<tr><td>T215B</td><td>Communication and Information Technologies – Part B</td><td>8</td><td>TM255</td></tr>
<tr><td>TM260</td><td>Ethics, Law and the Governance in IT</td><td>4</td><td>TM255</td></tr>
<tr><td colspan="5" align="center">Fourth Year</td></tr>
<tr><td>Semester</td><td>Modules</td><td>Title</td><td>Credit Hours</td><td>Prerequisite</td></tr>
<tr><td>1st</td><td>TM351</td><td>Data Management and Analysis</td><td>8</td><td>M269 or</td></tr>
</table>

(20 CHs)				M251
	TM354	Software Engineering	8	M251
	TM471A	Graduation Project-A	4	TM355 or TM354 or TM351
2nd (15 CHs)	TM355	Communications Technology	8	T215B
	TM471B	Graduation Project-B	4	TM471A
		Faculty Elective	3	

- **Computer Science Pathway - Recommended Study Plan**

First Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**
1st (13 CHs)	EL111	English Communication Skills I	3	EL099
	GR118	Life Skills and Coexistence	3	-
	GT101	Computing Essentials	3	-
	MST129	Applied Calculus	4	EL099
2nd (14 CHs)	AR113	Arabic Communication Skills	3	-
	EL112	English Communication Skills II	3	EL111
	MT131	Discrete Mathematics	4	EL111
	MT132	Linear Algebra	4	EL111
Second Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**
1st (14 CHs)	GB102	Principles of Entrepreneurship for Non-Specialists	3	-
	M110	Python Programming	8	EL111
		A module from University Requirement/Elective	3	-
2nd (19 CHs)	TM112	Introduction to Computing and Information Technology	8	M110
	TM105	Introduction to Programming	4	EL111
	TM103	Computer Organization and Architecture	4	EL111
		Faculty Elective	3	
Third Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**
1st (16 CHs)	M251	Object-Oriented Programming using Java	8	TM105
	TT284	Web Technologies	8	TM112
2nd (20 CHs)	M269	Algorithms, Data Structures and Computability	8	M110 & MT131
	TM298	Operating Systems	4	TM105 & TM103
	TM240	Computer Graphics and Multimedia	4	MT132 & TM105
	TM260	Ethics, Law and the Governance in IT	4	TT284

Fourth Year				
Semester	Modules	Title	Credit Hours	Prerequisite
1st (20 CHs)	TM351	Data Management and Analysis	8	M269 or M251
	TM354	Software Engineering	8	M251
	TM471A	Graduation Project-A	4	TM354 or TM351 or TM358
2nd (15 CHs)	TM358	Machine learning and artificial intelligence	8	M269
	TM471B	Graduation Project-B	4	TM471A
		Faculty Elective	3	

- **Network & Security Pathway -Recommended Study Plan**

First Year				
Semester	Modules	Title	Credit Hours	Prerequisite
1st (13 CHs)	EL111	English Communication Skills I	3	EL099
	GR118	Life Skills and Coexistence	3	-
	GT101	Computing Essentials	3	-
	MST129	Applied Calculus	4	EL099
2nd (14 CHs)	AR113	Arabic Communication Skills	3	-
	EL112	English Communication Skills II	3	EL111
	MT131	Discrete Mathematics	4	EL111
	MT132	Linear Algebra	4	EL111
Second Year				
Semester	Modules	Title	Credit Hours	Prerequisite
1st (14 CHs)	GB102	Principles of Entrepreneurship for Non-Specialists	3	-
	M110	Python Programming	8	EL111
		A module from University Requirement/Elective	3	-
2nd (19 CHs)	TM112	Introduction to Computing and Information Technology	8	M110
	TM105	Introduction to Programming	4	EL111
	TM103	Computer Organization and Architecture	4	EL111
		Faculty Elective	3	
Third Year				
Semester	Modules	Title	Credit Hours	Prerequisite
1st (16 CHs)	T216A	Cisco Networking (CCNA)-A	8	TM112
	TM254	Managing IT: the why, the what and the how	8	M110
2nd (20 CHs)	T216B	Cisco Networking (CCNA)-B	8	T216A
	M251	Object-Oriented Programming using Java	8	TM105
	TM260	Ethics, Law and the Governance in	4	T216B

		IT		

Fourth Year				
Semester	Modules	Title	Credit Hours	Prerequisite
1ˢᵗ (20 CHs)	T316	Advanced Networking	8	T216B
	T318	Applied Network Security	8	T216B
	TM471A	Graduation Project-A	4	T316 or T318 or T321
2ⁿᵈ (15 CHs)	T321	Operating System Server Administration	8	T216A
	TM471B	Graduation Project-B	4	TM471A
		Faculty Elective	3	

- **Web Development Pathway -Recommended Study Plan**

First Year				
Semester	Modules	Title	Credit Hours	Prerequisite
1ˢᵗ (13 CHs)	EL111	English Communication Skills I	3	EL099
	GR118	Life Skills and Coexistence	3	-
	GT101	Computing Essentials	3	-
	MST129	Applied Calculus	4	EL099
2ⁿᵈ (14 CHs)	AR113	Arabic Communication Skills	3	-
	EL112	English Communication Skills II	3	EL111
	MT131	Discrete Mathematics	4	EL111
	MT132	Linear Algebra	4	EL111
Second Year				
Semester	Modules	Title	Credit Hours	Prerequisite
1ˢᵗ (14 CHs)	GB102	Principles of Entrepreneurship for Non-Specialists	3	-
	M110	Python Programming	8	EL111
		A module from University Requirement/Elective	3	-
2ⁿᵈ (19 CHs)	TM112	Introduction to Computing and Information Technology	8	M110
	TM105	Introduction to Programming	4	EL111
	TM103	Computer Organization and Architecture	4	EL111
		Faculty Elective	3	
Third Year				
Semester	Modules	Title	Credit Hours	Prerequisite
1ˢᵗ (16 CHs)	M251	Object-Oriented Programming using Java	8	TM105
	M252	Internet Programming	8	TM112
2ⁿᵈ (20 CHs)	TM254	Managing IT: the why, the what and the how	8	M110
	TT284	Web Technologies	8	TM112
	TM260	Ethics, Law and the Governance in IT	4	TM254

<table>
<tr><th colspan="5">Fourth Year</th></tr>
<tr><th>Semester</th><th>Modules</th><th>Title</th><th>Credit Hours</th><th>Prerequisite</th></tr>
<tr><td rowspan="3">1ˢᵗ
(20 CHs)</td><td>TM352</td><td>Web, Mobile and Cloud Technologies</td><td>8</td><td>TT284 or M251</td></tr>
<tr><td>TM354</td><td>Software Engineering</td><td>8</td><td>M251</td></tr>
<tr><td>TM471A</td><td>Graduation Project-A</td><td>4</td><td>TM352 or TM354 or TM356</td></tr>
<tr><td rowspan="3">2ⁿᵈ
(15 CHs)</td><td>TM356</td><td>Interaction Design and User Experience</td><td>8</td><td>TT284</td></tr>
<tr><td>TM471B</td><td>Graduation Project-B</td><td>4</td><td>TM471A</td></tr>
<tr><td></td><td>Faculty Elective</td><td>3</td><td></td></tr>
</table>

- **Computing with Business Pathway -Recommended Study Plan**

<table>
<tr><th colspan="5">First Year</th></tr>
<tr><th>Semester</th><th>Modules</th><th>Title</th><th>Credit Hours</th><th>Prerequisite</th></tr>
<tr><td rowspan="4">1ˢᵗ
(13 CHs)</td><td>EL111</td><td>English Communication Skills I</td><td>3</td><td>EL099</td></tr>
<tr><td>GR118</td><td>Life Skills and Coexistence</td><td>3</td><td>-</td></tr>
<tr><td>GT101</td><td>Computing Essentials</td><td>3</td><td>-</td></tr>
<tr><td>MST129</td><td>Applied Calculus</td><td>4</td><td>EL099</td></tr>
<tr><td rowspan="4">2ⁿᵈ
(14 CHs)</td><td>AR113</td><td>Arabic Communication Skills</td><td>3</td><td>-</td></tr>
<tr><td>EL112</td><td>English Communication Skills II</td><td>3</td><td>EL111</td></tr>
<tr><td>MT131</td><td>Discrete Mathematics</td><td>4</td><td>EL111</td></tr>
<tr><td>MT132</td><td>Linear Algebra</td><td>4</td><td>EL111</td></tr>
<tr><th colspan="5">Second Year</th></tr>
<tr><th>Semester</th><th>Modules</th><th>Title</th><th>Credit Hours</th><th>Prerequisite</th></tr>
<tr><td rowspan="3">1ˢᵗ
(14 CHs)</td><td>GB102</td><td>Principles of Entrepreneurship for Non-Specialists</td><td>3</td><td>-</td></tr>
<tr><td>M110</td><td>Python Programming</td><td>8</td><td>EL111</td></tr>
<tr><td></td><td>A module from University requirement/Elective</td><td>3</td><td>-</td></tr>
<tr><td rowspan="4">2ⁿᵈ
(19 CHs)</td><td>BUS110</td><td>Introduction to Business</td><td>8</td><td>EL111</td></tr>
<tr><td>TM105</td><td>Introduction to Programming</td><td>4</td><td>EL111</td></tr>
<tr><td>TM103</td><td>Computer Organization and Architecture</td><td>4</td><td>EL111</td></tr>
<tr><td></td><td>Faculty Elective</td><td>3</td><td></td></tr>
<tr><th colspan="5">Third Year</th></tr>
<tr><th>Semester</th><th>Modules</th><th>Title</th><th>Credit Hours</th><th>Prerequisite</th></tr>
<tr><td rowspan="2">1ˢᵗ
(16 CHs)</td><td>B207A</td><td>Shaping Business Opportunities-A</td><td>8</td><td>BUS110</td></tr>
<tr><td>M251</td><td>Object-Oriented Programming using Java</td><td>8</td><td>TM105</td></tr>
<tr><td rowspan="3">2ⁿᵈ
(20 CHs)</td><td>B207B</td><td>Shaping Business Opportunities-B</td><td>8</td><td>B207A</td></tr>
<tr><td>TM254</td><td>Managing IT: the why, the what and the how</td><td>8</td><td>M110</td></tr>
<tr><td>TM260</td><td>Ethics, Law and the Governance in IT</td><td>4</td><td>TT284</td></tr>
<tr><th colspan="5">Fourth Year</th></tr>
</table>

Semester	Modules	Title	Credit Hours	Prerequisite
1st **(20 CHs)**	BUS310	Strategic Management	8	B207B
	TM354	Software Engineering	8	M251
	TM471A	Graduation Project-A	4	(TM351 & BUS310) or (TM354 & BUS310)
2nd **(15 CHs)**	TM351	Data Management and Analysis	8	M251
	TM471B	Graduation Project-B	4	TM471A
		Faculty Elective	3	

- **Data Science Pathway -Recommended Study Plan**

First Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**
1st **(13 CHs)**	EL111	English Communication Skills I	3	-
	GR118	Life Skills and Coexistence	3	-
	GT101	Computing Essentials	3	-
	MST129	Applied Calculus	4	EL099
2nd **(14 CHs)**	AR113	Arabic Communication Skills	3	-
	EL112	English Communication Skills II	3	EL111
	MT131	Discrete Mathematics	4	EL111
	MT132	Linear Algebra	4	EL111
Second Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**
1st **(14 CHs)**	GB102	Principles of Entrepreneurship for Non-Specialists	3	-
	M110	Python Programming	8	EL111
		A module from University Requirement/Elective	3	-
2nd **(20 CHs)**	TM112	Introduction to Computing and Information Technology	8	M110
	M140	Introducing statistics	8	EL111
	TM260	Ethics, Law and the Governance in IT	4	M110
Third Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**
1st **(16 CHs)**	M218	Relational Databases	4	M110, MT131
	MT248	Analysing data	4	M140
	M269	Algorithms, Data Structures and Computability	8	M110 and MT131
2nd **(19 CHs)**	M238	Data Visualization	4	M110
	MST224	Mathematical Methods	8	MST129 & MT132
	MT249	Practical Modern Statistics	4	MT248
		Faculty Elective	3	

Fourth Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**
1st **(20 CHs)**	M348	Applied Statistical Modelling	8	MT248
	TM351	Data management and analysis	8	M269
	TM471A	Graduation Project-A	4	M348 or TM351 or TM358
2nd **(15 CHs)**	TM358	Machine learning and artificial intelligence	8	M269
	TM471B	Graduation Project-B	4	TM471A
		Faculty Elective	3	

- **Cyber Security Pathway -Recommended Study Plan**

First Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**
1st **(13 CHs)**	EL111	English Communication Skills I	3	EL099
	GR118	Life Skills and Coexistence	3	-
	GT101	Computing Essentials	3	-
	MST129	Applied Calculus	4	EL099
2nd **(14 CHs)**	AR113	Arabic Communication Skills	3	-
	EL112	English Communication Skills II	3	EL111
	MT131	Discrete Mathematics	4	EL111
	MT132	Linear Algebra	4	EL111
Second Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**
1st **(14 CHs)**	GB102	Principles of Entrepreneurship for Non-Specialists	3	-
	M110	Python Programming	8	EL111
		A module from University Requirement/Elective	3	-
2nd **(20 CHs)**	TM112	Introduction to Computing and Information Technology- 2	8	M110
	TM129	Technologies in practice	8	M110
		Faculty Elective	3	
Third Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**
1st **(16 CHs)**	TT284	Web technologies	8	TM112
	T216A	Cisco networking (CCNA) part1	8	TM112
2nd **(19 CHs)**	T216B	Cisco networking (CCNA) part2	8	T216A
	TM256	Cyber Security	8	TM129
	TM260	Ethics, Law and the Governance in IT	4	TM256
Fourth Year				
Semester	**Modules**	**Title**	**Credit Hours**	**Prerequisite**

1st (20 CHs)	TM311	Information security	8	T216B
	TM359	System penetration testing	8	TM256
	TM471A	Graduation Project-A	4	TM311 or TM359 or T318
2nd (15 CHs)	T318	Applied Network Security	8	T216B
	TM471B	Graduation Project-B	4	TM471A
		Faculty Elective	3	

- **Artificial Intelligence Pathway -Recommended Study Plan**

First Year				
Semester	Modules	Title	Credit Hours	Pre-requisite
1st (13 CHs)	EL111	English Communication Skills I	3	EL099
	GR118	Life Skills and Coexistence	3	-
	GT101	Computing Essentials	3	-
	MST129	Applied Calculus	4	EL099
2nd (14 CHs)	AR113	Arabic Communication Skills	3	-
	EL112	English Communication Skills II	3	EL111
	MT131	Discrete Mathematics	4	EL111
	MT132	Linear Algebra	4	EL111
Second Year				
Semester	Modules	Title	Credit Hours	Prerequisite
1st (18 CHs)	GB102	Principles of Entrepreneurship for Non-Specialists	3	-
	M110	Python Programming	8	EL111
	MT141	Introduction to Probability and Statistics	4	EL111
		A module from University Requirement/Elective	3	-
2nd (15 CHs)	TM112	Introduction to Computing and Information Technology	8	M110
	TM103	Computer Architecture and Organization	4	EL111
		Faculty Elective	3	
Third Year				
Semester	Modules	Title	Credit Hours	Prerequisite
1st (16 CHs)	M269	Algorithm, Data structure and Computability	8	M110 & MT131
	TM270	Artificial intelligence	8	TM112 & MT141
2nd (20 CHs)	TM271	Machine Learning and Deep learning	8	MT141 & TM270
	TM275	Parallel and Distributed Systems	4	TM103
	TM276	Software Development Processes and Methodologies	4	TM112
	TM260	Ethics, Law and the Governance in IT	4	TM271
Fourth Year				

Semester	Modules	Title	Credit Hours	Prerequisite
1st (20 CHs)	TM351	Data Management and Analysis	8	M269
	TM340	Natural Language Processing	8	TM271
	TM471A	Graduation Project - A	4	TM351 or TM340 or TM341
2nd (15 CHs)	TM341	Computer Vision	8	TM271
	TM471B	Graduation Project - B	4	TM471A
		Faculty Elective	3	

For details refer to AOU Website at

https://www.arabou.edu.kw/faculties/computer/Pages/undergraduate-programs.aspx

8.1 Types of the Programme's Certificate

AOU offers basically, two types of B.Sc. certificates as classified bellow:

1. BSc (Hons) Information Technology and Computing (360 points) validated by the local authorities of Ministries of higher educations in the AOU branches

2. Three different types of certificates validated by the Open University, UK, based on the completed credits as below (see figure 1.):

   ➢ **BSc (Hons) Information Technology and Computing (360 Points)**

   - BSc (Hons) Information Technology and Computing
   - BSc (Hons) Information Technology and Computing (Computer Science)
   - BSc (Hons) Information Technology and Computing (Networking & Security)
   - BSc (Hons) Information Technology and Computing (Web Development)
   - BSc (Hons) Information Technology and Computing (Computing with Business)
   - BSc (Hons) Information Technology and Computing (Data Science)
   - BSc (Hons) Information Technology and Computing (Cyber Security)

- BSc (Hons) Information Technology and Computing (Artificial Intelligence)
- ➢ **Diploma of Higher Education in Information Technology and Computing (240 points)**
  - DipHE IT & Computing
  - DipHE IT & Computing (Computer Science)
  - DipHE IT & Computing (Networking & Security)
  - DipHE IT & Computing (Web Development)
  - DipHE IT & Computing (Computing with Business)
  - DipHE IT & Computing (Data Science)
  - DipHE IT & Computing (Cyber Security)
  - DipHE IT & Computing (Artificial Intelligence)

- ➢ **Certificate of Higher Education in Information Technology and Computing (120 points)**
  - CertHE IT & Computing
  - CertHE IT & Computing (Computing with Business)
  - CertHE IT & Computing (Data Science)
  - CertHE IT & Computing (Cyber Security)

    CertHE IT & Computing (Artificial Intelligence)
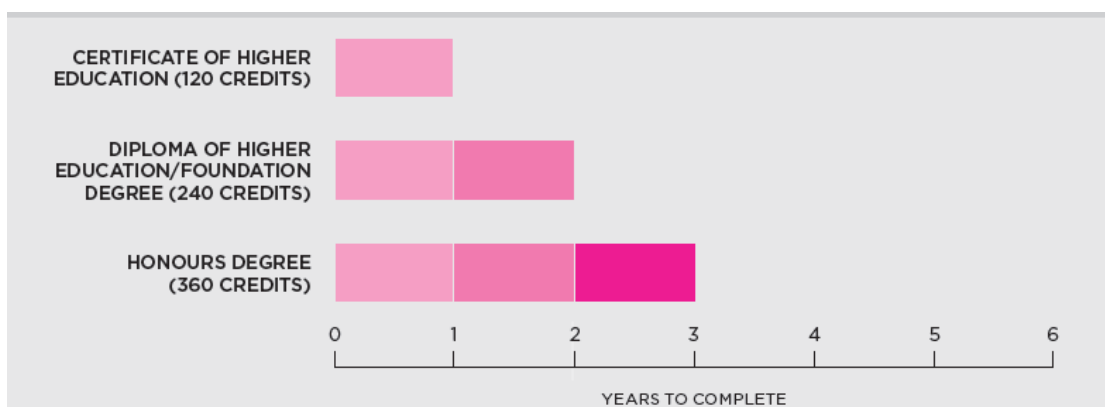
Figure 1. Types of Certificates Offered by Open University, UK.
please note that the Certificate and Diploma awards are exit awards only

9. Module Specifications

For more details, please refer to section 8 and the following AOU Website

https://www.arabou.edu.kw/faculties/computer/Pages/course-catalogue.aspx

10. Student Support, Guidance and Advice

Good experienced tutors are available across AOU campuses to provide proper academic advice and guidance to students. Each student is assigned to a specific academic advisor to get the necessary academic advising and support. In general, there is an Academic Advising Unit at each branch to help all the students in their academic life and personal issues as well as providing advice regarding jobs and future career. The contact information of those staff members is available at the local campuses. The following table 10.1 gives an overview about the available services and support to ITC students across various AOU campuses. students are encouraged to identify with guidance, to reflect on their own learning needs and are offered the following support as appropriate to those needs:

Table 10.1. Details of Student support, guidance and advice

Service	Detail
Student induction day	Student induction day that focuses on the requirements for the B.Sc.'s modules and graduation project.
Student handbook	AOU student handbook containing the main information related to the university, and the various programmes of study.
LMS	A virtual learning environment to support students remotely via teaching/learning material, supplementary material, frequently asked questions and collaborative tools and technologies.
Support/Teaching/Management Staff	Access to support, teaching and management staff.
Online Resources	Access to AOU resources e.g. physical library/digital library, eLearning materials – outside normal class times.
Appeals and Complaints System	Online access to student services through the Student Support System (SSS) at https://sisonline.arabou.edu.kw/
Disability and Dyslexia Support Services (DDSS)	AOU provides all students the necessary services to enable them to fulfil the intended learning outcomes of their study in a friendly educational and social environment. Students with disabilities and learning difficulties are paid special attention. The services provided to our students are dealt with confidentially and are not disclosed to a third part without the

	student's written consent. This DDSS online system provides the students with all information about the services and facilities made available to them by AOU and is accessible at https://sisonline.arabou.edu.kw/
Financial aids	Financial aid and advice are provided to our students
Learning support	Access to a large collection of reading material, simulations, Java applets, video clips, e-library, LMS and secrets of student success to enhance your study skills is made available to our students at https://arabou.edu.kw/.
Career Advice	A collection of video clips on choosing a career, writing a professional CV and preparation for interview is accessible at: Find job How to prepare your CV Most in demand skills in 2021: Most in demand skills - 2021 Skills that can get you hired in 2021: Skills that can get you hired

11. Opportunities for Personal Development Planning

By virtue of being an Open Education institution, the AOU encourages students to prepare Personal Development Planning (PDP) for themselves. The PDP provides opportunity to students to plan their studies according to the goals and objectives that they want to achieve from their studies. It enables them to track their achievements and goals in a systematic manner. It provides a platform to them to reflect on their studies and measure their progress towards intended objectives that they want to achieve. The PDP is a valuable tool in Open Education since it supports the process of developing Independent Learning which is the key for success in open learning environment.

12. Opportunities and Support for Study Abroad

The current proposal of the B.Sc. programme requires the completion of all modules of the academic calendar at the FCS - AOU. In case student wishes to transfer to another institution, s/he would be required to inquire about the transfer of credits provisions at that institution.

13. Work Placement Information

There is no work placement requirement in the current study plan of the B.Sc. programme. The main practical work involved is the individual practical work required during the preparation of the Tutor Marked Assignment (TMA), one of the assessment components per module, in addition to the practical work required for the Final Graduation Project (TM471).

14. Facilities and Services

All braches enjoy adequate resources, especially in light of:

- Operating in new building for most branches, including Kuwait, Egypt, Jordan, Bahrain, KSA, Lebanon.
- Meeting the standards of the domestic accreditation bodies and Ministries of Higher Education.
- Continuously updating and upgrading both the physical and electronic resources, including e-library, Learning Management System (LMS), Student Information System (SIS), etc. to support students. In addition, wide range of supplementary material and video recordings are offered through the LMS.
- Introducing the Smart Book to some modules by agreement with McGraw-Hill, the publisher, in order to support students and provide the highest technology available in e-learning.
- AOU provides enough computer labs for its students equipped with hardware and software resources to support the curriculum of the cloud programmes.
- Specialized labs are provided at AOU campuses such as Cisco labs to support Networking modules. The new buildings offer seminar halls and dedicated spaces for libraries with at least one lab to access the e-library. It is interesting to point out that well-trained human resources are provided to help students, accessing either the physical or e-library. Regular workshops are held for students, especially new comers, to train them on how to use LMS and e-library, and to provide them with the fundamental background about good academic behaviour.

- The e-Library could be accessed at the AOU's website through the following link: http://www.aou-elibrary.com/
- Appeals and Complaints system is inside Student Information System (SIS) on the AOU website. The URL is: https://sisonline.arabou.edu.kw/
- Central LMS that can be navigated once student logs in to local LMS via link https://mdl.arabou.edu.kw/

15. Assessment and progression regulations

AOU assessment strategy is based on general principles and procedures aiming to organize and monitor the examinations at all AOU branches. AOU regulations include validation (pre-assessment moderation) of examination questions and answer keys by external examiners (EE), audit tutors' marking, post-assessment moderation; and 4 tiers of examination committees which are:

- Branch Examination Committee (BEC)
- Module Assessment Committee (CAC)
- Faculty Examination Committee (FEC)
- Central Examination Committee (CEC)

See Appendix F. for more details.

15.1 Main Principles of Assessment at AOU

AOU has explicit procedures for ensuring that student performance is properly judged and for evaluating how academic standards are maintained through assessment practice. The following are some of the procedures which FCS:

- All types of assessment aim to test the Learning Outcomes (LOs) matched with the module.
- The creation and administration of all types of assessment is a team work.
- All assessment components are reviewed and approved by EEs.
- Strict quality measures take place to guarantee fair/correct marking at all branches and across them through Cross branch marking (CBM)

- Sample of students' marked work/scripts from all the modules per branch as well as the CBM are review by EEs which is done at the end of each academic semester.
- There are four tiers of Examination Board structure to approve the final students' results at the end of each semester.

15.2 Assessment Components

The assessments at AOU comprise of 3 components:

- Tutor Marked Assignment (TMA) weighs 20%

    Students are provided detailed feedback on their TMA work and this is an essential part of learning policy at AOU. Feedback, which is usually an Excel sheet, provides clear distribution of grades, tutor comments for each question and students' strengths, weaknesses, and steps for improvement. Feedback is provided to students on LMS and can be discussed with students during in class face-to-face, laboratory, and office hours.
- Mid-Term Assessment (MTA) weighs 30%
- Final Exam weighs 50%

For more details about the assessment, see section 17.

Graduation project (TM471) has different weights as follow:

- Preliminary presentation: 5 %
- Report Part-1: 25%
- Presentation (Final): 10%
- Report (Final): 35%
- Implementation (deliverable): 25%

For more details about the assessment of graduation project, see section 16

15.3 Grade Point Average (GPA) and Equivalent Letter Grades:

AOU follows the Grade Point Average (GPA) on a scale of 0 to 4 as in table 15.1 below:

Table 15.1 GPA and Equivalent Letter Grades at AOU Mapping to OU

AOU		
Letter Grade	Range	Points

A	100 – 90	4.00
B+	89 – 82	3.50
B	81 – 74	3.00
C+	73 – 66	2.50
C	65 – 58	2.00
D	57 – 50	1.50
Fail	Below 50	0

On successful of student, his/her grade will be out of 4 as shown in table 15.2. Below:

Table 15.2 Cumulative Average Grade

Cumulative Average	Grade
3.67-4.00	Excellent
3.00-3.66	Very Good
2.33-2.99	Good
2.00-2.32	Pass

15.4 Marking of Assessments:

Marking, Double-marking, and Cross Branch Marking.

The FCS adopts transparent and fair mechanisms for marking which is done by tutors and approved by EE. The process goes through several steps:

- **Marking**: done by tutors within the branch and monitored by BCC.
- **Double-marking**: done by tutors within the branch and monitored by BCC
- **Cross Branch Marking (CBM)**: done by tutors from another branch to ensure uniformity of script marking

For more details, the assessment and progression regulations have been made available to students on the AOU's website at https://www.arabou.edu.kw/university/Pages/regulations.aspx. In addition, assessment guides will be provided to students with the module material packages.

16. Graduation projects

The module TM471 is the final component of the B.Sc. Programme at FCS. Students undertake and complete the TM471 Project work on individual basis.

Topics of the final year project are chosen by students themselves or suggested ideas by their supervisor. In both cases, deep discussions take place between the student and the supervisor in order to select the suitable project topic. Then the student has to submit project proposal that explain the main outline of the project. During the academic semesters, student should show up and presents his/her progress in order to receive proper advice, feedback, and support by supervisor.

The project consists of a written report of about 8,000 to 10,000 words. This report is a culmination of about two semesters of research work by student, individually, under the guidance of student's project supervisor. Student must also complete one TMA's, project implementation and give 2 oral presentations.

In order to undertake the TM471 Project, various software tools and packages would be required. It is the student's duty to consult his/her supervisor well in advance of project selection regarding the availability of both the software tools and the expertise available at FCS regarding the usage of the tools. Student should agree with his/her supervisor regarding the software tools that would be required for TM471 projects in advance to avoid any future problems.

17. Determination of results

For various modules, the assessment usually consists of 3 components; Tutor Marked Assignments (TMA), Midterm Assessment (MTA) and Final Examination. The weighting of the assessment components is as follow:

- TMA: 20 %
- MTA: 30 %
- Final Exam: 50 %

It is important to note that the AOU flexibly adopts a different assessment methodology to cope with any emergency. For example, during the pandemic of COVID19, AOU has adopted the following method:

- TMA: 20 %
- MTA: has been changed to 5 online quizzes that worth in total 30 %

- Final Exam: has been changed to be Take Home Exam that worth 50 %

To pass any module the following conditions should take place:

- Continuous assessment (TMA + MTA): at least 30%
- Final Exam: at least 40%
- In total at least 50% of the overall mark (TMA + MTA + Final).

The results are processed centrally at the Headquarters, and communicated to student by domestic branch authorities after being approved by the Central Examination Committee (CEC) at the Headquarters. The FCS at AOU follows a tiered approach to examination boards and committees. The key role of these assessment boards is to ensure fairness and standardization of the assessment processes.

17.1 How Results Are Communicated

Final module results are announced on the university website (https://arabou.edu.kw/), where students can check at their results by logging in to the Student_Information_System (SIS) with student's credentials. This link can be found under the student services menu. The following screens show the steps:

1. Login to the online Student Services with student number as a User ID and student's password and select the correct branch.
2. Once the student logs in, he/she can avail the benefits of the available services provided on the system.
3. The student will select the box titled Grades Box in the 2nd row in order to view his/her grades. By selecting Grades box, the grades details will appear on student' computer screen.

Note: Grades are not confirmed until they have been approved by External Examiners and ratified at Exam Boards.

18. Other institutional policies and regulations

Some of the information below may be given in the form of general brief statements that refer student to a separate generic institutional policy document.

- Disability statement

- Grounds and procedures for appeals

- Equal opportunities statement

- Data protection

- Health and safety issues

The AOU strongly believes in providing ***equal opportunities*** to all students studying at the university. It also makes efforts to provide a safe, secure, healthy and confidential environment to students (https://www.arabou.edu.kw/university/Documents/Regulations/aou/en/Equal%20Opportunity%20and%20Respect%20for%20Diversity.pdf). students have the right to appeal to the branch authorities. Processes and procedures for your appeals / complaints and disability and dyslexia enquiries are contained in the rules and regulations of the AOU and are accessible to students through the University's website at (https://sisonline.arabou.edu.kw/).

1. Once student login to the online Student Services using the correct credential, the student select the Box titled "Student Support" in order to view his/her grades.

2. On selecting Student Support box, a screen consisting of Appeals and Complaints details will appear on student's computer screen.

19. Student participation and evaluation

Students are strongly encouraged to participate in and evaluate the academic activities at AOU. Student feedback is solicited through various surveys such as students' views on modules, tutors, and facilities etc. Also, some students are members of the Student Staff Liaison Committee (SSLC). Students' views are considered as a very important instrument which is continuously solicited and used in enhancing Students learning experience at AOU.

AOU has finalized the bylaws of its Alumni association and it is expected that Students feedback will contribute in enhancing all FCS programmes.

Student feedback is an essential element of the Quality Assurance (QA) process at AOU. The QA department solicits feedback from students through a variety of questionnaires and feedback forms, which are offered through the

Learning Management System (LMS). The QA department has Branch QA Coordinators (BQACs) who are responsible for collecting student feedback at each Branch. The aforementioned feedback is subjected to detailed analysis by both the AOU_QA Department as well as the Deanship in order to be included and concluded in the Annual Programme Evaluation that is submitted to the OUVP.

The major areas on which student feedback is obtained include the following:

- Student evaluation of tutors
- Student evaluation of modules
- Student evaluation of branch resources and service

Student can also apply for appeals, which are dealt with through the online appeals and complaints system (part of the SIS-Student Information System).

The Arab Open University's Alumni Association (AOUAA) is an association that aims at maintaining relations between AOU and its former students and between graduates and their fellows. AOUAA is a forum for forming relationships between people of common interest. AOUAA is organized into 9 chapters at KSA, Kuwait, Bahrain, Oman, Egypt, Jordan, Lebanon, The Sudan and Palestine. AOU Alumni Association Bylaws could be found on the university's website. FCS encourages students to register in the AOUAA.

20. General reading list

A general reading list (i.e. not module specific), including electronic resources) has been compiled by FCS staff. The list indicates some important books and journals. This list has been made available to students at the following link: https://www.arabou.edu.kw/faculties/computer/Pages/general-reading-list.aspx

Electronic resources are available on the LMS at the AOU's website (http://www.arabou.edu.kw/).

End of Student-Handbook