



Arab Open University

Bachelor - Information Technology and Computing Programme

- 1] BSc (Honours) Information Technology and Computing (ITC)
- 2] BSc (Honours) Information Technology and Computing (CS)
- 3] BSc (Honours) Information Technology and Computing (WD)
- 4] BSc (Honours) Information Technology and Computing (N&S)
- 5] BSc (Honours) Information Technology and Computing (CwB)

Faculty of Computer Studies

Validated by OU (2017)

This Document combines the following details about the five pathways:

Section 1: Programme Educational Aims and Objectives

Section 2: Programme Intended Learning Outcomes (ILOs)

Section 3: Programme Structure

Section 1: Information Technology and Computing Programme Educational Aims and Objectives

Educational aims and objectives of the Information Technology and Computing (ITC) programme

The Information Technology and Computing (ITC) programme has been designed and developed to provide a high quality programme of study to students at the Faculty of Computer Studies (FCS), Arab Open University (AOU). The design and development of this programme have taken into consideration the guidelines provided by professional standard bodies, including the QAA, UK (QAA2016) and the curriculum guidelines of ACM-IEEE 2013 in addition to the up-to-date prospectus of the Computing and Information Technology provided by the Open University-UK. Hence, this programme will enable the students at FCS, AOU to fulfil the standards expected of the ITC graduates. The flexibly structured ITC programme has the following overall aims:

- To provide students with a sound grasp of essential principles of hardware based, software based or systems based technologies.
- To provide students familiarity with a variety of modern programming languages and the underlying principles of programming paradigms- functional, object oriented, logical etc.
- To enable students to solve scientific problems, along with appreciation for mathematical and scientific methods which will provide lifelong support to their carrier.
- To enable students to apply their knowledge and skills in a broad range of ITC related industries and organisations.
- To prepare students for employment in a wide range of firms, including communication systems, software engineering, networking and Security or web technologies.
- To enhance students' experience in communication, time management, analysis and problem solving.
- To develop students' skills for working in a team to tackle an appropriate development task and accomplish projects to demonstrate their ability to undertake a substantial piece of work.

1] Educational aims and objectives of the Information Technology and Computing (ITC) Pathway

This flexibly structured pathway has the following overall aims:

- To provide students with up to date principles and concepts of system based technologies, including hardware and/or software based systems.

- To enable students to apply their knowledge and understanding appropriately in activities such as analysis, abstraction, problem-solving, design, development and testing in a wide range of industries and organisations.
- To prepare students for employment in the field of ITC, including developing, integrating, and/or maintaining software and/or hardware based systems.
- To equip students with appropriate cognitive, key, practical and professional skills, including the skills needed to undertake lifelong learning in their chosen professional field.
- To enhance students' experience in communication, time management, analysis and problem solving related to ITC systems.
- To develop students' skills for working in a team to tackle an appropriate development task and accomplish projects to demonstrate their ability to undertake a substantial piece of work.

2] Educational aims and objectives of the Computer Science (CS) Pathway

Professionals working in the software industry at large bring many different kinds of expertise to their work environment. The aim of the Computer Science (CS) Pathway is to equip the student with the knowledge and skills he/she will need to take part in software related industry. In particular, our aim is to give the student:

- A grasp of computer science and of modern computer systems.
- Strong skills in software engineering, strategy and project management in addition to multimedia technologies.
- The ability to understand and work in software systems that are now being constructed and used, including distributed Internet systems, intelligent systems and databases.
- Essential skills required for software development and maintenance, such as analysis, design, programming and evaluation are built and maintained.
- A familiarity with a variety of modern programming languages and the underlying principles of Programming paradigms-functional, object oriented, logical, etc.
- An ability to solve scientific problems, along with appreciation for mathematical and scientific methods which will provide lifelong support to their carrier.
- An ability to work with other people in a team, communicating computing ideas effectively in a verbal and written manner.
- The qualities that come with being a graduate such as: specialist knowledge, intellectual self-confidence and independence, analytical ability and the life-long learning skills needed to keep up with fast-changing technologies.

3] Educational aims and objectives of the Web Development (WD) Pathway

This modern pathway has the following overall aims:

- To provide students with a wide umbrella of up-to-date knowledge and understanding of Web based solutions, Internet of things and Cloud Computing.
- Prepare students to integrate the principles, concepts and techniques associated with web application/solutions, including the analysis, design and development processes involved.
- To provide the students with the necessary tools and methodologies, to construct, design and implement up-to-date web solutions; to enable them to carry out a project in web development that applies and extends their knowledge and understanding.
- To provide the students with the skills to be able to use the latest programming, networking and human-computer interaction methods for designing and developing advanced web applications.
- To provide students with the required skills that enable them to consider and understand the potentials and limitations of web based systems.
- To enable the students to work with other people in a team, communicating ideas effectively in a verbal and written manner.
- To provide the student with the qualities that come with being a graduate such as: specialist knowledge, intellectual self-confidence and independence, analytical ability and the life-long learning skills needed to keep up with fast-changing technologies.

4] Educational aims and objectives of the Networking and Security (N&S) Pathway

Networking and Security are disciplines that are closely intertwined and that undergo fast technological advances. The N&S Pathway aims to prepare the students for a professional career in these areas. It has the following overall aims:

- To enable students to develop knowledge and understanding of the fundamental concepts and technologies related to Networking and Security.
- To prepare students to apply, creatively and responsibly, their knowledge and understanding of networking systems and security techniques in activities such as: the critical analysis of these systems; effective planning, administration, and management of such systems; the proposal and planning of enhancements to these systems; the objective evaluation of the use of such systems.
- To enable students to make reasoned arguments concerning the wide range of issues and challenges faced by networking and security systems.
- To prepare students for professional work in the fields of networking and security by providing them with the skills and capabilities needed to undertake lifelong learning and to keep their knowledge and understanding up to date.

- To enable the student to work with other people in a team, communicating ideas effectively in a verbal and written manner.
- To prepare students to not only be employed as Network related specialist, but also a Security specialist such as, Cyber Security Analysts, etc.
- To provide the student with the qualities that come with being a graduate such as: specialist knowledge, intellectual self-confidence and independence, analytical ability and the life-long learning skills needed to keep up with fast-changing technologies.

5] Educational aims and objectives of the Computing with Business (CwB) Pathway

Computing and Business are disciplines that have become closely intertwined through the world of work. The aim of the Computing and Business pathway is to equip the student with the knowledge and skills the student will need to take part in the management and execution of computer-related projects in a business setting. In particular, it has the following overall aims:

- To provide the students a grasp of the key concepts of computing and of modern computer systems, especially in Business context.
- To provide the students an acquaintance with all facets of the world of business: markets, organizations, processes, strategies, policies and decision-making, etc., along with the role of ITC.
- To prepare the students to understand the types of software systems that are now being constructed and used in business and management fields such as, e-commerce systems, Management Information systems, ERP solutions, Human Capital Management, data analytics, etc.
- To provide students with essential skills required for software development and maintenance, such as analysis, design, programming and evaluation are built and maintained.
- To prepare the students to develop key business skills of communication, presentation and team working.
- To enable students to acquire the qualities that come with being a graduate: specialist knowledge, intellectual self-confidence and independence, analytical ability and the life-long learning skills needed to keep up with fast-changing technologies.

Section 2: Information Technology and Computing (ITC) Programme Intended Learning Outcomes (ILOs)

The subject benchmark statements provided by the QAA, UK (QAA 2016) have been taken into account in the preparation of the Learning Outcomes of the ITC programme pathways. These include the skill sets that the graduates of computing are expected to possess. The associated teaching, learning and assessment methodologies have also been provided below in the learning outcomes of each pathway. The intended learning outcomes for all five pathways of the ITC Programme are listed below.

1] Learning Outcomes of Information Technology and Computing (ITC) Pathway

The ITC pathway provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

A. Knowledge and understanding of:

Students graduating from the ITC pathway should demonstrate:

1. The ability to describe and evaluate the principles, concepts and techniques associated with the technology of computers and digital communication systems, at both the individual component and the system level, including use of appropriate models.
2. The ability to recognise the broad range of contexts in which computers and digital communication systems are used and of the various ways in which users interact with them.
3. The ability to describe the major trends and issues in Information Technology and Computing.
4. The ability to integrate professionally the lifecycle of computing and IT systems, including the integration of theory and practice to develop specifications, designs, and implementations to solve novel problems.

B. Cognitive skills

Students graduating from the ITC pathway should be able to:

1. Explain the differentiation between IT and Computing systems, including hardware based, software based or system based contexts.
2. Illustrate the sound grasp of principles of ITC technologies for abstracting, modelling, problem-solving, designing and testing in the fields of Information Technology and Computing, being aware of the limitations involved.
3. Distinguish the features and specifications of hardware based, software based IT and Computing systems.

4. Extend the knowledge about ITC systems to carry out a small project in Information Technology and/or Computing at the module level (as part of the TMA) that applies their knowledge and understanding; critically reflecting on the processes involved and the outcomes of their work.

C. Practical and/or professional skills

Students graduating from the ITC pathway should be able to:

1. Specify, design, develop, deploy and manage small computing and IT projects.
2. Investigate, compare, clarify and select IT and computing systems, according to particular demand.
3. Plan and organize themselves and their work appropriately; keep systematic records of work in progress and outcomes.
4. Deal with issues such as risk and complexity, including the ability to perform trouble shooting in unstructured environments.

D. Key skills

Students graduating from the ITC pathway should be able to:

1. Demonstrate the ability to work independently and as part of a team, gathering and evaluating different types of information, identifying problems, developing and documenting solutions, and making effective use of ICT for project management, communication and collaboration.
2. Communicate and report professionally and effectively in an Information Technology and Computing context.
3. Apply problem-solving skills in an Information Technology and Computing context.
4. Critically analyse and use data and information effectively in Information Technology and Computing context.
5. Exhibit proficiency in using the appropriate numerical and mathematical skills.
6. Conduct own self learning to the extent that they are prepared for lifelong learning after graduating.

2 Learning Outcomes of Computer Science (CS) Pathway

The Computer Science pathway provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

A. Knowledge and understanding of:

Students graduating from the CS pathway should be able to:

1. Describe and effectively use the key concepts of computer science.
2. Judiciously select the methods and tools used to develop software solutions.

3. Demonstrate a good grasp of the key concepts of software development, integration and maintenance, including principles of requirements analysis, design and programming.
4. Describe the different approaches and methods/techniques of representing, visualizing and extracting information from data, including from the large data sets (Big Data).
5. Integrate the key concepts related to Computer Science, including algorithms, data structures, computability, object oriented programming languages, Software Engineering, development and testing of software systems.
6. Adopt novel solutions in a range of situations in which computer science can be applied, the ways in which people interact with computer science solutions, and the ethical, social and legal problems that computer science can create and solve.

B. Cognitive skills

Students graduating from the CS pathway should be able to:

1. Interpret and analyse problems, and design & evaluate novel solutions to them.
2. Explain key software development concepts and apply them to practical problems.
3. Distinguish between a variety of software design and development methods, tools and testing methodologies.
4. Compare and contrast a variety of software development methods and tools, identifying the best choices to apply to specific problems.
5. Distinguish and appreciate the various roles, functions and interactions of members of a software “solution” development team.
6. Demonstrate the ability of becoming a computational thinker and to provide efficient computing solutions.

C. Practical and/or professional skills

Students graduating from the CS pathway should be able to:

1. Plan, design, develop, test and evaluates computer science applications.
2. Deploy modern software tools for construction of computer science solutions and applications to solve practical problems.
3. Test and critically evaluate different software solutions.
4. Participate in multidisciplinary projects, wherever Computer Science plays a dominant role in such projects.
5. Consider and handle the ethical, social and legal issues that may arise during software development and use.

D. Key skills

Students graduating from the CS pathway should be able to:

1. Organise their work independently, planning, monitoring, reflecting on and improving your own learning.
2. Categorise work in a group, communicating effectively.

3. Investigate, find, assess and apply information from a variety of sources, using the most suitable information technology solution where necessary.
4. Apply numerical and analytical techniques to solve problems.
5. Critically analyse and effectively use data and information in Computer Science concept.

3] Learning Outcomes of the Web Development (WD) Pathway

The WD pathway provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

A. Knowledge and understanding of:

Students graduating from the WD pathway should be able to:

1. Develop a good grasp of the principles, concepts and techniques associated with web development, including an understanding of the analysis, design and development processes involved.
2. Effectively use the terms, hypothesis, theories and practices associated with web development at both the individual component and the system level, including the use of appropriate models.
3. Demonstrate a range of social, legal, ethical and professional skills required for continuing professional development in the web development discipline within a world-wide context.
4. Adopt novel solutions in a range of situations in which web technologies/solutions can be applied.
5. Define the possibilities and limitations of the state of the art web based systems.
6. Demonstrate a grasp of key concepts related to Cloud Computing and services, Project Management and Internet Security.

B. Cognitive skills

Students graduating from the WD pathway should be able to:

1. Demonstrate the ability of becoming a computational thinker and to provide efficient web-based solutions.
2. Interrelate theory and practice hence aiding in the comprehension of web development practices and applications.
3. Integrate the main concepts/approaches related to software development and the state-of-the-art web technologies to provide innovative web based solutions, including the recent technologies such as Cloud Computing, Internet of things, etc.
4. Interpret and refine specifications and implementations of web based systems/applications, including testing and critical evaluation.
5. Apply their knowledge and understanding by devising and carrying out innovative projects in Web Development.

C. Practical and/or professional skills

Students graduating from the WD pathway should be able to:

1. Design and develop responsive web solutions.
2. Create, integrate, maintain and optimize advanced web-based systems for different usages.
3. Plan and organize themselves and their work appropriately; keep systematic records of work in progress and outcomes.
4. Evaluate and improve the development of web based systems and portals through an iterative process.
5. Evaluate the Key Performance Indicators of interactive design.
6. Consider important issues such as risk and complexity in their work.

D. Key skills

Students graduating from the WD pathway should be able to:

1. Organise own learning and performance to the level that they are prepared for lifelong learning after graduating.
2. Show and demonstrate a range of transferable skills in, problem solving, communication, project management, self-management, working individually, working in a group in a distance setting and collaborate via computer-mediated communication.
3. Investigate, retrieve, reflect, and assess and use data/information effectively in a web development context.
4. Apply appropriate numerical and mathematical skills to solve practical problems related to web development.

4] Learning Outcomes of Networking and Security (N&S) Pathway

The Networking and Security pathway provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

A. Knowledge and understanding of:

Students graduating from the N&S pathway should be able to:

1. Define, identify, and describe the fundamental concepts of security at the level of policy and strategy in computer system, principles and techniques associated with wired and wireless communication networks, along with their underlying security challenges and countermeasures, at both the individual component and the system level. This includes topics such as computer system operation and architectures; LANs; WLANs; WANs; fixed and mobile telephone networks; encoding; modulation; multiplexing; routing; switching; protocols; standards; network management and reliability; security and privacy.

2. Describe and evaluate the physical principles underlying computer and digital communication networks, and the mathematical rules governing security algorithms and protocols used in these networks. Critically evaluate security techniques used to protect system and user data.
3. Identify and describe the possibilities and limitations of computer networking and security systems, together with the technological and commercial compromises inherent in the design of such systems.
4. Adopt novel solutions in a range of situations in which networking and security systems can be applied.
5. Describe the interaction of social, historical, economic, political and personal issues with networking systems and their corresponding security measures.
6. Identify the major trends in computer networking and security technologies and recognise the implications of these trends.

B. Cognitive skills

Students graduating from the N&S pathway should be able to:

1. Explain the key concepts related to networks (wired and wireless) and security. Explain the significance of issues such as security and resilience, appreciate the role of firewalls, malware protection, backup strategies etc.
2. Interpret techniques for modeling, designing, developing, problem-solving and testing of communication networks, computer systems and their related security measures and protocols, being aware of the limitations and challenges involved. This includes techniques such as simulating, diagramming, optimising, and their associated tools.
3. Explain, contrast and/or critically analyse and refine specifications of proposals for and/or implementations of networking and communication systems in addition to security techniques, making use of technical literature, simulations and/or mathematical modeling, as appropriate.
4. Express reasoned arguments about social, historical, economic, political and personal issues, as they apply to computer networking and security systems. Appreciate the role of humans in Cyber Security as well as the different sources of threats and how to mitigate against them.
5. Extend their knowledge by designing and carrying out a small personal project in networking and security .

C. Practical and/or professional skills

Students graduating from the N&S pathway should be able to:

1. Use appropriate simulation and modelling tools in order to investigate, analyse, design, evaluate and/or test networking and communication systems in addition to network security systems and methods. Design systems that connect mobile devices and undertake analysis of network traffic, storage media (cards, disks) for evidence of misuse.

2. Plan and organise themselves and their work appropriately; keep systematic records of work in progress and outcomes.
3. Consider and deal with issues such as risk and complexity and evaluation of Network Security alternatives.
4. Critically discuss and assess alternatives for Networking and Security solutions.

D. Key skills

Students graduating from the N&S pathway should be able to:

1. Organise and improve their own learning and performance to the extent that they are prepared for lifelong learning.
2. Communicate and report effectively in the context of networking & security and technology by discussing, describing, and explaining related concepts and ideas.
3. Demonstrate the ability to work independently and as part of a team, gathering and evaluating different types of data/information, identifying problems, developing and documenting solutions, and making effective use of ICT for project management, communication and collaboration.
4. Apply appropriate numerical and mathematical skills.
5. Apply problem-solving skills in the context of networking and security.
6. Apply state –of-the-art tools effectively to support work in networking and security.
7. Survey, retrieve, evaluate, critically asses and effectively use data/information related to networking and security.

5] Learning Outcomes of Computing with Business (CwB) Pathway

The CwB pathway provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

A. Knowledge and understanding of:

Students graduating from the CwB pathway should be able to:

1. Explain the key concepts of computing, data management and analysis, including principles of design and implementation of IT project, and the representation and meaning of data in a business context.
2. Integrate legal managerial and professional issues in computing.
3. Explain the key concepts of programming languages, algorithms, methods and techniques.
4. Identify Information systems technology including data structure, data bases and the internet.
5. Choose the methods and tools used for IT projects and service management.
6. Identify decision making and support tools.

7. Demonstrate knowledge and understanding of financial management, and human resource management.
8. Demonstrate knowledge and understanding of strategic planning and management of change.

B. Cognitive skills

Students graduating from the CwB pathway should be able to:

1. Analyze practical problems, and use software development concepts to design and evaluate solutions to them.
2. Describe, compare and contrast a variety of IT project management methods and tools, identifying the best choices to apply to specific problems.
3. Explain the various roles, functions and interactions of members of a project management team;
4. Describe business concepts and models and apply them to different aspects of business behaviour.
5. Evaluate business decisions and government business policy.

C. Practical and/or professional skills

Students graduating from the CwB pathway should be able to:

1. Design, develop, test, evaluate, maintain and support computer systems in a business computing environment that are well structured, reliable and usable. They should be able to apply their knowledge to analyse business problems, prepare strategies and make effective decisions to solve such problems.
2. Use modern decision making management tools.
3. Identify and handle the ethical, social and legal issues that may arising from IT project management and use, and from business decisions and policies.

D. Key skills

Students graduating from the CwB pathway should be able to:

1. Demonstrate independency in learning, planning, monitoring, and work accomplishment.
2. Communicate effectively with team members, managers and customers.
3. Plan and manage a project to complete within budget and schedule, appreciate the legal and professional implications of their work and present their work in the form of report.
4. Find, assess and apply information from a variety of sources, using information technology where necessary.
5. Use numerical and analytical techniques to solve problems showing in depth knowledge of IT and business management.

Section 3: Information Technology and Computing Programme Structure

Programme Requirements (131 Credit Hours)

Students seeking a BSc Honours degree in Information Technology and Computing must complete at least 131 credit hours:

1. General University requirements – Mandatory (Table 1).
2. General University requirements – Elective (Table 2).
3. Faculty compulsory Requirements (Table 3).
4. Faculty elective requirements (Table 4).
5. Faculty core requirements (Table 5 for each pathway)

The different components of the Programme Requirements are as follows: -

Requirements	Points	Credit Hours
A] University Requirements / Mandatory	60	18
B] University Requirements / Elective	10	3
C] Faculty Requirements / Mandatory	30	8
D] Faculty Requirements / Elective	20	6
E] Specialisation Requirements / Mandatory	360	96
Total	480	131

The details of these requirements are as follows:-

➤ **A] University Requirements - Mandatory (60 points) (18 Credit Hours)**

Table 1: Details of University Requirements (Mandatory)

Module Code	Module Title	Credit Hours	Pre-requisites
GR101	Self-Learning Skills	3	--
TU170	Computing Essentials	3	--
AR111	Arabic Communication Skills I	3	--
AR112	Arabic Communication Skills II	3	AR111
EL111	English Communication Skills I	3	--
EL112	English Communication Skills II	3	EL111
Total		18	

➤ **B] University Requirements - Electives (10 points) (3 Credit Hours)**

Table 2: 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 Arab World	3	--
GR115	Current International Issues and Problems	3	--
GR116	Youth Empowerment	3	--
GR117	Women Empowerment	3	--
GR118	Life skills	3	--
GR121	Environment and Health	3	--
GR131	General Branch Requirement	3	--
GR110	Islamic Culture Mandatory Course (Sudan)	3	--
LAW107	Human Rights in the International Law (Bahrain)	3	--

BE322/4	Entrepreneurship and Small Business Management	4	B120
EL118	Reading	4	EL111
CHI101	Chinese for Beginners (I)	3	--
CHI102	Chinese for Beginners (II)	3	CHI101
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

➤ **C] Faculty Requirements - Mandatory (30 points) (8 Credit Hours)**

Table 3: Details of Faculty Requirements (Mandatory)

Module code	Module title	Credit Hours	Points	Source	Pre-requisites
MT129	Calculus and Probability	4	15	AOU	EL099
TM260	Security, Ethics and Privacy in IT and Computing	4	15	AOU	TM111

➤ **D] Faculty Requirements / Elective (20 points) (6 Credit Hours)**

Table 4: Details of Faculty Requirements (Electives)

Module code	Module title	Credit Hours	Points	Source	ITC	CS	N&S	WD	CwB	Pre-requisites
MS102	Physics	3	10	AOU	✓	✓	✓	✓	✓	EL111
M109	.NET Programming	3	10	AOU	✓	✓	✓	✓	✓	EL111
MT101	General Mathematics	3	10	AOU	✓	✓	✓	✓	✓	None
TM297	Compression Methods for Multimedia	3	10	AOU	✓					TM112 & MT131
MT390	Image Processing	3	10	AOU	✓					MT132 & M251
TM295	System Modelling	3	10	AOU		✓				MT132
MT372	Parallel Computing	3	10	AOU		✓				M269 & M251
TM290	Cryptography and Internet Security	3	10	AOU			✓			TM112
MT395	Applied Cyber Security	3	10	AOU			✓			TM260
TM287	Web Applications Development	3	10	AOU				✓		TM105
MT380	Service Oriented Architecture	3	10	AOU				✓		M251
TM291	Management Information Systems	3	10	AOU					✓	BUS110 & TM105
TM391	E-commerce	3	10	AOU					✓	B207B & M251

Note- The student will not be allowed to take more than one elective module per level from the above Table-4, according to proper Academic Advising. Core modules of any pathway might serve as Elective modules for other pathways, according to proper Academic Advising.

➤ **E] 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:

1] Information Technology and Computing (ITC Pathway)

Core modules for this Pathway are depicted in the following table:

ITC pathway core modules						
Level	Code	Module Title	Source	Points	Credit Hours	Pre-requisites
1	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
	TM111	Introduction to Computing and Information Technology I	OU	30	8	EL111
	TM112	Introduction to Computing and Information Technology II	OU	30	8	TM111
ST				120	32	
2	T215A	Communications and Information Technologies-A	OU	30	8	TM112
	T215B	Communications and Information Technologies-B	OU	30	8	T215A
	M251	Object-Oriented Programming using Java	AOU	30	8	TM105
	M269	Algorithms, Data Structures and Computability	OU	30	8	TM105 & MT131
ST				120	32	
3	TM355	Communications Technology	OU	30	8	T215B
	TM351	Data Management and Analysis	OU	30	8	M269 & M251
	TM354	Software Engineering	OU	30	8	M251
	TM471	Graduation Project (ITC Pathway)	AOU	30	8	TM355 or TM354 or TM351
ST				120	32	
Total				360	96	

2] Computer Science (CS Pathway)

Core modules for this Pathway are depicted in the following table:

Computer Science pathway core modules						
Level	Code	Module Title	Source	Points	Credit Hours	Pre-requisites
1	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
	TM111	Introduction to Computing and Information Technology I	OU	30	8	EL111
	TM112	Introduction to Computing and Information Technology II	OU	30	8	TM111
ST				120	32	
2	M251	Object-Oriented programming using Java	AOU	30	8	TM105
	T227	Change, Strategy and Project at Work	OU	30	8	TM112
	M269	Algorithms, Data Structures and Computability	OU	30	8	TM105 & MT131
	TM298	Operating Systems	AOU	15	4	TM105&TM103
	TM240	Computer Graphics and Multimedia	AOU	15	4	MT132&TM105
ST				120	32	
3	TM351	Data Management and Analysis	OU	30	8	M269 & M251
	TM354	Software Engineering	OU	30	8	M251
	TM366	Artificial Intelligence	AOU	30	8	M269
	TM471	Graduation Project (CS Pathway)	AOU	30	8	TM354 or TM366 or TM351
ST				120	32	
Total				360	96	

3] Networking & Security (N&S Pathway)

Core modules for this Pathway are depicted in the following table:

Networking & Security pathway core modules						
Level	Code	Module Title	Source	Points	Credit Hours	Pre-requisites
	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
	TM111	Introduction to Computing and Information Technology I	OU	30	8	EL111
	TM112	Introduction to Computing and Information Technology II	OU	30	8	TM111
ST				120	32	
2	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
	T227	Change, Strategy and Project at Work	OU	30	8	TM112
ST				120	32	
3	T316	Advanced Networking	AOU	30	8	T216B
	T318	Applied Network Security	AOU	30	8	T216B & TM260
	TM352	Web, Mobile and Cloud Technologies	OU	30	8	M251
	TM471	Graduation Project –(N&S Pathway)	AOU	30	8	T316 or T318 or TM352
ST				120	32	
Total				360	96	

4] Web Development (WD Pathway)

Core modules for this Pathway are depicted in the following table:

Web Development pathway core modules						
Level	Code	Module Title	Source	Points	Credit Hours	Pre-requisites
	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
	TM111	Introduction to Computing and Information Technology I	OU	30	8	EL111
	TM112	Introduction to Computing and Information Technology II	OU	30	8	TM111
ST				120	32	
2	M251	Object-Oriented programming using Java	AOU	30	8	TM105
	T227	Change, Strategy and Project at Work	OU	30	8	TM112
	M269	Algorithms, Data Structures and Computability	OU	30	8	TM105 & MT131
	TT284	Web Technologies	OU	30	8	TM112
ST				120	32	
3	TM352	Web, Mobile and Cloud Technologies	OU	30	8	TT284
	TM354	Software Engineering	OU	30	8	M251
	TM356	Interaction Design and User Experience	OU	30	8	TT284
	TM471	Graduation Project (WD Pathway)	AOU	30	8	TM352 or TM354 or TM356
ST				120	32	
Total				360	96	

5] Computing with Business (CwB Pathway)

Core modules for this Pathway are depicted in the following table:

Computing with Business pathway core modules						
Level	Code	Module Title	Source	Points	Credit Hours	Pre-requisites
1	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
	TM111	Introduction to Computing and Information Technology I	OU	30	8	EL111
	B110	Introduction to Business	AOU	30	8	EL111
ST				120	32	
2	B207A	Shaping Business Opportunities-A	OU	30	8	BUS110
	B207B	Shaping Business Opportunities -B	OU	30	8	B207A
	M251	Object-Oriented Programming using Java	AOU	30	8	TM105
	M269	Algorithms, Data Structures and Computability	OU	30	8	TM105 & MT131
ST				120	32	
3	BUS310	Strategic Management	AOU	30	8	B207B
	TM351	Data Management and Analysis	OU	30	8	M269 & M251
	TM352	Web, Mobile and Cloud Technologies	OU	30	8	M251
	TM471	Graduation Project -CWB	AOU	30	8	TM351 & BUS310 or TM352 & BUS310
ST				120	32	
Total				360	96	

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