

BSc (Hons) Computer Science (Full Time) - IC318

1. CONTEXT AND OBJECTIVES

Computer Science is a fast-expanding research and application field that nurtures knowledge and skills for developing innovative ways to harness the power of computing to address problems in almost every discipline and industry sector. Computer Science involves both the theoretical and practical disciplines. The theoretical disciplines include the theory of computation, formal specifications of systems, algorithm complexity and principles behind programming languages. The practical aspects involve understanding the concepts, designing and implementing software at various layers of computer systems. Broadly, these consist of the systems layer and the application layer, but each of these is further subdivided. The systems layer consists of operating systems, networks, middleware and support for concurrent, distributed and parallel processing. The application layer consists of tools supporting software development as well as the actual development of software for various disciplines. The programme is in line with international recommendations of computing curricula for Undergraduate Degree Programs in Computer Science.

The objectives of this programme is to enable students to:

- have a sound understanding of the theoretical aspects of Computer Science;
- have a strong background in programming to allow them to adapt easily to the development of software in the different systems and application areas;
- understand different types of data structures, use the most appropriate one in a given situation for efficient storage and access of data;
- implement data structures if not directly supported by a programming environment;
- analyse the complexity algorithms and select the most efficient algorithm for a particular situation;
- have a sound understanding of systems level software including the operating systems the computer network software and write programs that interact with these systems;
- analyse, design and implement software in different application areas.

Competencies and Career Opportunities

Job prospects exist in the fields of software development, systems analysis, software testing, intelligent systems, networking, computer security, research, etc.

After graduation, students should have achieved the skills required to continue their studies in the field of Computer Science, as well as skills for continuous learning. The programme of study is oriented towards training students in the scientific design and technical application of computer systems. The curriculum content is designed with ICT industry collaboration to prepare future graduates to join the workforce equipped with up-to-date knowledge and problem-solving skills.

2. LEARNING OUTCOMES

Graduates of the BSc (Hons) Computer Science programme should be able to:

- Demonstrate an understanding of the operational principle of a computer, design and implement computer programs; estimate the performance of computer programs and compare alternative implementations of computer programs;
- Explain the basic structure of an operating system and its functional components;
- Apply the basic concepts of software engineering and real-time systems; realize a software project using a project management approach;
- Design and realize an application utilizing a computer network;
- Apply the acquired knowledge in a creative and critical manner in their work;
- Work responsibly both independently and as a team member;

- Demonstrate information and communication technology tools and adapt to new surrounding throughout his/her career;
- Communicate clearly, fluently and effectively both orally and in writing; and
- Monitor and interpret developments in computer science and engineering and to develop their own skills with it.

3. TEACHING AND LEARNING METHODS

The BSc (Hons) Computer Science programme consists of Teaching Contact Hours, Self-Study and Other Learning Activities. Teaching methods may include face to face lectures, online delivery, tutorials or practical sessions.

For each module, 6 LCCS credits contribute to 30 hours of direct contact, 60 hours of self-study and 90 hours of other activities, except for ICDT 1200, ICDT 2200 & ICT 3000Y, for which the details about the total hours in each category will be specified in the module catalogue.

Other Learning Activities may comprise of the following:

- Working on assignments;
- Sitting for class test and preparation time for same;
- Sitting for examination and preparation time for same;
- Group work;
- Attending Workshops/Conferences recommended by the Department / Faculty;
- Fieldwork;
- Site Visits/Trips;
- Additional Practicals;
- Presentation among Peers;
- Experimental Learning;
- Placement / Internships;
- Guest Lectures.

4. ENTRY REQUIREMENTS

(i) **General Requirements**

As per General Entry Requirements for Admission to the University for Undergraduate Degrees.

(ii) **Programme (Specific) Requirements**

At least 2 GCE 'A' Level Passes including:

- Mathematics
- AND**
- Computing or a Science subject.

5. PROGRAMME DURATION

	Minimum (Years)	Maximum (Years)
Degree	3	5

6. MINIMUM LCCS CREDITS REQUIRED FOR DEGREE AWARD

(i) For Degree Award: 206 LCCS credits

For the degree award in BSc (Hons) Computer Science, the student must obtain at least 206 LCCS credits including:

Modules	LCCS Credits
Minimum LCCS Credits for Core Modules	170
Minimum LCCS Credits for Electives	12
Final Year Project	18
Industrial Training	6
TOTAL	206

(ii) For Diploma Award: 120 LCCS credits

The Diploma is provided as a possible exit point in the programme. To be able to exit with a Diploma in Computer Science, a student must have attained 120 LCCS credits, which satisfy requirements specified by University Regulations for Exit Points. A student may also opt to complete a Diploma Project worth 12 LCCS credits to attain the 120 LCCS credits. The assessment of the Diploma Project will be based on project report, presentation and software/system demo. Written requests to exit with Diploma should be made to the Dean of Faculty.

(iii) Credits per Year

Students may register for a maximum of 96 LCCS credits and a minimum of 12 LCCS credits, per year.

7. ASSESSMENT AND DEADLINES

The assessment mode for each module will be based on one or a combination of the following:

- Examination
- Continuous Assessment
- Software Evaluation
- Portfolio evaluation

Students will be assessed by continuous assessment (CA) and/or formal examination for taught modules. The weight of the CA will be at least 40%, while examination may carry upto 60% of the total marks. The specific details and/or formula for the calculation of the final mark are provided in the Module Catalogue for each module.

Information regarding the classification of award and student grading is provided in the university regulations.

8. LIST OF MODULES

Module Code	Module Name	L*/T*/P* Contact Hours/Week	Self- Study Hours/ Week	Other Learning Hours/ week	LCCS Credits
CORE MODULES					
ICDT 1016Y(1)	Communication and Business Skills for IT	2+1	6	9	12
ICT 1017Y(1)	Computer Programming	2+0+1	6	9	12
ICT 1019Y(1)	Computer Architecture	2+0+1	6	9	12
ICT 1022Y(1)	Computation and Formal Systems	2+1	6	9	12
ICT 1043Y(1)	Computational Mathematics	2+1	6	9	12
ICT 1036Y(1)	Database Design	2+0+1	6	9	12
ICDT 1200	Practical Training	1 week (30 total)	1 week (15 total)	1 week (15 total)	2
ICT 2019Y(3)	Algorithms and Complexities	2+0+1	6	9	12
ICT 2020Y(3)	Object-Oriented Techniques	2+0+1	6	9	12
ICT 2022Y(3)	Operating Systems	2+0+1	6	9	12
ICT 2023Y(3)	User Interface Design and Computer Graphics	2+0+1	6	9	12
ICT 2040Y(3)	Web-Centric Computing	2+0+1	6	9	12
ICT 2042Y(3)	Software Engineering and Project Management	2+1	6	9	12
ICDT 2200	Industrial Training	(10 weeks)	-	-	6
ICT 3000Y(5)	Final Year Project	-	-	-	18
ICT 3053Y(5)	Computer Networks and System Administration	2+0+1	6	9	12
ICT 3090Y(5)	Capacity Planning and Intelligent Systems	2+0+1	6	9	12
TO CHOOSE ELECTIVES(s) OFFERED BY THE DEPARTMENT					
ICT 3057Y(5)	Parallel and Distributed Systems	2+0+1	6	9	12
ICT 3091Y(5)	Computer Systems Security	2+0+1	6	9	12
ICT 3092Y(5)	Wireless Networking and Ubiquitous Technologies	2+0+1	6	9	12
ICT 3093Y(5)	Computer Vision, Biometrics and Pattern Recognition	2+0+1	6	9	12
ICT 3094Y(5)	Multimedia and Real-Time Systems	2+0+1	6	9	12

Note:

1. Contact Hours = L* : Lectures+ T* : Tutorials+ P* : Practicals

9. PROGRAMME PLAN

Year 1 - Semester 1 & 2			
Module Code CORE	Module Name	L*/T*/P* Contact Hours/Week	LCCS Credits
ICDT 1016Y(1)	Communication and Business Skills for IT	2 + 1	12
ICT 1017Y(1)	Computer Programming	2+0+1	12
ICT 1019Y(1)	Computer Architecture	2+0+1	12
ICT 1022Y(1)	Computation and Formal Systems	2+1	12
ICT 1043Y(1)	Computational Mathematics	2+1	12
ICT 1036Y(1)	Database Design	2+0+1	12
ICDT 1200	Practical Training	1 week (30 hours)	2
Sub Total			74
Year 2 - Semester 1 & 2			
Module Code CORE	Module Name	L*/T*/P* Contact Hours/Week	LCCS Credits
ICT 2019Y(3)	Algorithms and Complexities	2+0+1	12
ICT 2020Y(3)	Object-Oriented Techniques	2+0+1	12
ICT 2022Y(3)	Operating Systems	2+0+1	12
ICT 2023Y(3)	User Interface Design and Computer Graphics	2+0+1	12
ICT 2040Y(3)	Web-Centric Computing	2+0+1	12
ICT 2042Y(3)	Software Engineering and Project Management	2+1	12
ICDT 2200	Industrial Training	10 weeks	6
Sub Total			78

Year 3 - Semester 1 & 2			
Module Code CORE	Module Name	L*/T*/P* Contact Hours/Week	LCCS Credits
ICT 3000Y(5)	Final Year Project	-	18
ICT 3053Y(5)	Computer Networks and System Administration	2+0+1	12
ICT 3090Y(5)	Capacity Planning and Intelligent Systems	2+0+1	12
ELECTIVES	Choose one module from:		
ICT 3057Y(5)	Parallel and Distributed Systems	2+0+1	12
ICT 3091Y(5)	Computer Systems Security	2+0+1	12
ICT 3092Y(5)	Wireless Networking and Ubiquitous Technologies	2+0+1	12
ICT 3093Y(5)	Computer Vision, Biometrics and Pattern Recognition	2+0+1	12
ICT 3094Y(5)	Multimedia and Real-Time Systems	2+0+1	12
Sub Total			54
TOTAL = 206			

Note:

1. The University reserves the right not to offer a given elective module if the critical number of students is not attained and/or for reasons of resource constraints.

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This Programme has been amended as follows: 2013, 2017, 2018, 2019, 2020