BACHELOR OF SCIENCE IN COMPUTER SCIENCE AND ENGINEERING

Introduction to the Program

The Department of Computer Science and Engineering aims to graduate highly competent students with the potential of becoming the leaders in their field and also to impart knowledge which allows them to understand the implications of their work on both to themselves as well to the society as a whole.

ULAB CSE, since its inception, has been offering an undergraduate program in Computer Science and Engineering with focus on developing skills for ICT industries worldwide. The designed program provides students with fundamental skills needed to become an accomplished IT specialist. The program also aims at a wider knowledge of the subject, rather than a mere understanding of the existing commercial approaches. The degree is designed for a wide range of students, including those who wish to pursue a career in software engineering, computer programming or related areas, and also those who wish to move on to study for higher degrees in the computing and information technology areas, either at home or abroad.

The department believes in a philosophy of Active Learning which is reflected in our curriculum and teaching styles. The Computer Science and Engineering (CSE) curriculum has been designed with both theoretical and industry oriented courses. The department provides state of the art laboratory facilities, with guidance from the top notch faculties, to bring out the best from the students. Departmental active collaboration with local and international reputed companies is keeping both CSE students and faculty updated with industry innovations and requirements. In their last academic year, students will be able to choose a concentration area or any other elective courses to focus their career according to their interest. Furthermore, the Liberal Arts curricular framework will help the students to acquire an openness of vision to become adaptable and ever-effective professionals of this century and for the time to come. The program objectives address our goal of graduating highly competent students with a potential of becoming leaders in their careers and add value to the society.

Degree Requirements – Bachelor of Computer Science and Engineering (CSE)

Course requirements for the B Sc in CSE are shown below. Additionally, students should read General Academic Policy in this Handbook for the complete set of requirements for earning a bachelor's degree.

	Courses	Credits
General Education Courses	10	30
Major Core Courses	24	79
Major Elective Courses	04	12
Project/Thesis	01	04
Optional/Minor	05	15
Total	**44**	**140**

GED Core (7 courses / 21 credits)

Course Code	Course Title
ENG 101	Basic English
ENG 102	Fundamentals of English-I
ENG 103	Fundamentals of English-II
GED 103	History of Emergence of Independent Bangladesh
GED 101	Bangla Bhasha
CSE 101	Introduction to Computer Studies
GED 201	World Civilization

Note: Placement in English courses will be based on diagnostic tests. Candidates achieving high marks in English diagnostic tests will be exempted from ENG 101 and ENG 102. They may take optional courses in lieu of the specified English courses.

GED Elective Courses (3 courses / 09 credits)

GED Elective offerings will vary from term to term. The three electives will be spread over terms 5, 6 and 7. Students will have to choose from the courses offered in a particular term (See details in **General Education Program** section).

Course Listing

A. Major Core Courses (24 courses / 79 credits)

Mathematics and Statistics		
Course Code	**Title**	**Credits**
MAT 101	Differential and Integral Calculus	3
MAT 102	Co-ordinate Geometry and Linear Algebra	3
MAT 201	Differential Equation and Numerical Analysis	3
MAT 203	Mathematical Methods	3
STA 206	Statistics and Probability	3

Physics and Electronics		
Course Code	**Title**	**Credits**
PHY 101	Physics I	3
ETE 202	Electronic Devices and Circuits I	3
ETE 203	Electronic Devices and Circuits I LAB	1
ETE 204	Digital Electronics	3
ETE 205	Digital Electronics LAB	1

CSE Core Courses		
Course Code	**Title**	**Credits**
CSE 103	Structured Programming	3
CSE 104	Structured Programming LAB	1
CSE 201	Object Oriented Programming	3
CSE 202	Object Oriented Programming LAB	1
CSE 203	Computer Organization and Architecture	3
CSE 204	Operating Systems	3
CSE 205	Discrete Mathematics	3
CSE 207	Data Structures	3
CSE 208	Data Structures LAB	1
CSE 303	Database Systems	3
CSE 305	Algorithms	3
CSE 306	Algorithms LAB	1
CSE 307	Microprocessor and Interfacing	3

CSE 309	Data Communication and Computer Networks	3
CSE 401	System Analysis and Design	3
CSE 404	Software Engineering	3
CSE 410	Artificial Intelligence	3
CSE 412	Programming with Java	3
CSE 413	Programming with Java LAB	1
CSE 417	Automata and Theory of Computation	3
CSE 480	Web Technology	3

A. Major Elective Courses (Any 4 courses / 12 credits)

Course Code	Title	Credits
CSE 402	Wireless and Mobile Computing	3
CSE 403	E-Commerce	3
CSE 405	Computer Graphics	3
CSE 406	Embedded Systems Design	3
CSE 407	Database Management System-II	3
CSE 408	Computer Modeling and Simulation	3
CSE 409	Advanced Programming Languages	3
CSE 411	Compiler Design	3
CSE 414	Software Quality Assurance and Testing	3
CSE 415	Visual Programming	3
CSE 416	.NET Programming using C#	3
CSE 418	Routers and Routing Basics	3
CSE 419	Management Information System	3
CSE 421	WAN Technology	3
CSE 422	Systems Programming	3
CSE 423	Advanced Computer Architecture	3
CSE 424	Parallel Programming	3
CSE 425	Peripherals and Interfacing	3
CSE 426	Advanced Computer Networking	3
CSE 427	Multimedia Design and Development	3
CSE 428	Enterprise System Design and Development	3
CSE 429	Digital Image Processing	3
CSE 430	Neural Networks and Pattern Recognition	3
CSE 431	Computational Geometry	3
CSE 432	Introduction to Quantum Computer	3
CSE 433	Computer Security	3
CSE 434	Pattern Recognition	3
CSE 435	Bioinformatics	3
CSE 436	Introduction to Robotics	3
CSE 438	Smart Phone Application Development	3
CSE 440	Human Computer Interaction	3

CSE 447	VLSI Design	3
CSE 498	Social and Professional Issues in Computing	3
ETE 315	Digital Signal Processing	3
ETE 463	Optical Fiber Communication	3

Optional/Minor (5 course/15 credits)*

1. For CSE Students

CSE students have to take five courses offered by other departments. They can do this in one of two ways: (a) do a Minor (comprised of five structured courses) in any other undergraduate program, such as Media Studies & Journalism (MSJ), English & Humanities (DEH), Business Administration (BBA), Electronics and Telecommunication Engineering (ETE). Electrical and Electronics Engineering (EEE) or Sustainable Development Studies (SDS) or General Education (GED) (to be introduced soon), or (b) choose any five courses that is offered as a Minor/Optional course, subject to availability and fulfillment of prerequisite, from any department, except by the CSE department.

Students who wish to do a Minor should visit the relevant departmental section in this handbook for the list of courses to be taken. For example, if a student wishes to do a minor in English & Humanities, he/she should see the "Minor Courses" paragraph in the Bachelor of Arts in English and Humanities section.

2. For Students from other departments wishing to do a Minor in CSE

Students from other departments wishing to do a Minor in Computer Science and Engineering will be required to complete five courses as detailed below:

	Code	**Title**	**Pre-requisites**	**Credits**
Compulsory	CSE 103 & CSE104	Structured Programming & Lab		4(3+1)
Any Four	CSE 303	Database Management System		3
	CSE 311	Automated Office Management		3
	CSE 403	E-Commerce		3
	CSE 406	Embedded Systems Design	Completed **CSE 103** & **ETE 204** in previous semesters	3
	CSE 412 & CSE 413	Programming with Java & Lab	Completed **CSE 103** in previous semesters	4(3+1)
	CSE 416	.NET Programming using C#	Completed **CSE 103** in previous semesters	3
	CSE 417	Automata and Theory of Computation	Completed **CSE 103** in previous semesters	3
	CSE 419	Management Information System		3
	CSE 427	Multimedia Design and Development		3
	CSE 428	Enterprise System Design and Development		3
	CSE 429	Digital Image Processing	Completed **CSE 103** & **MAT 101** in previous semesters	3
	CSE 447	VLSI Design	Completed **ETE 204** in previous semesters	3
	CSE 480	Web Technology	Completed **CSE 103** in previous semesters	3

Project/Thesis/Internship

Students, who completed 120 credits, are allowed to register for CSE499. CSE499 serves as the core element of the undergraduate studies in CSE program. It consists of studies and research on a topic derived from the student's field of interest as well as from the perspective of the industry. The project is chosen in the final year of the study.

Research for the project work will be carried out during a student's final year of study and will be based on the identification of appropriate sources and methods under the guidance of a project supervisor who is the full-time faculty member of the department. Students will have to submit a report along with the demonstration of the project work before the project assessors on the scheduled project defense date.

Selection of Topic and Preparation

In the course of the study, a student needs to give careful thoughts to identify the area of interest for research and developments. This not only drives students towards the right selection of topic for the project but at the same time enable them to gain understanding on the inner facts of the problem that s/he may address in the project work. Research seminars and workshops help student to identify an area of research activity and guide them on the formulation of the problem area. The ICT industries will collaborate with the department to formulate ideas of research and developments in the project work.

Working on the Project

In the course of the project work, students should be able to devote a large amount of time to the progress of the work. Students will require frequent discussions with project advisor to prepare the background during the early stage of the project. The department has dedicated facilities comprising powerful workstations, digital archiving hardware, white board etc to inculcate the culture of the team work. The project team members will defend the project topic and based on the project timeline, there will be follow-up presentations to track and monitor the progress of the project work.

Presentation and Submission

Supervision and Feedback

During consultation with the supervisor, student should discuss outstanding problems and questions of revision, style and presentation. S/he should ask the supervisor to read and to comment upon a draft version of the project and on the outline of the project presentation for the defense.

Final Version of the Project

The final version of the project work should be completed incorporating ideas acquired during the discussion and during draft revision of the work with the supervisor.

Length and Format

The department provides necessary guideline on the format of the project report along with other important deadlines.

Internship

Students who choose to carry out internship in an organization will also follow the same guidelines as stated above.

4-Year Distribution of Courses

	Course Code	Course Title	Credits
Term – 1	CSE 101	Introduction to Computer Studies	3
	ENG 101	Basic English and Learning Skills	3
	MAT 101	Differential and integral Calculus	3
		Total Credits	**9**
Term – 2	CSE 103 & CSE 104	Structured Programming & LAB	3+1
	ENG 102	Fundamentals of English - I	3
	GED 103	History of Emergence of Independent Bangladesh	3
	MAT 102	Co-ordinate Geometry and Linear Algebra	3
		Total Credits	**13**
Term – 3	CSE 201 & CSE 202	Object Oriented Programming & LAB	3+1
	ENG 103	Fundamentals of English - II	3
	GED 101	Bangla Bhasha	3
	PHY 101	Physics I	3
		Total Credits	**13**
Term – 4	CSE 207 & CSE 208	Data Structures & LAB	3+1
	CSE 205	Discrete Mathematics	3
	ETE 202 & ETE 203	Electronic Device and circuits – I & LAB	3+1
	GED 201	World Civilization	3
		Total Credits	**14**
Term – 5	CSE 305 & CSE 306	Algorithms & LAB	3+1
	ETE 204 & ETE 205	Digital Electronics & LAB	3+1
		GED Elective 1	3
	MAT 201	Differential Equations and Numerical Analysis	3
		Total Credits	**14**
Term – 6	CSE 303	Database Management System	3
	CSE 412 & CSE 413	Programming with Java & LAB	3+1
		GED Elective 2	3
	MAT 203	Mathematical Methods	3
		Total Credits	**13**
Term – 7	CSE 203	Computer Organization and Architecture	3
	CSE 417	Automata and Theory of Computation	3
		GED Elective 3	3
	STA 206	Statistics and Probability	3
		Total Credits	**12**

Term – 8	CSE 204	Operating Systems	3
	CSE 309	Data Communication and Computer Networks	3
		Major Elective 1	3
		Optional/Minor 1	3
		Total Credits	**12**
Term – 9	CSE 307	Microprocessor and Interfacing	3
	CSE 401	System Analysis and Design	3
		Optional/Minor 2	3
		Major Elective 2	3
		Total Credits	**12**
Term – 10	CSE 404	Software Engineering	3
	CSE 410	Artificial Intelligence	3
		Optional/Minor 3	3
		Optional/Minor 4	3
		Total Credits	**12**
Term – 11	CSE 480	Web Technology	3
		Major Elective 3	3
		Optional/Minor 5	3
		Total Credits	**9**
Term – 12	Major Elective 4		3
	CSE 499	Project	4
		Total Credits	**7**

*NOTE: Not all courses will be available every term. The Computer Science and Engineering Department reserves the right to add, drop or substitute individual courses, subject to review from academic authorities.