PROGRAM: B.Sc. in Computer Science & Engineering

OBE SYLLABUS

Duration (minimum): 4-Year (8 Semesters)

Maximum Period of Completion for the Program: 7 (seven) Years
Admission Requirements: SU-rules or as suggested by UGC
Academic Calendar:

The academic year shall be divided into two regular Semesters (1st/Spring and 2nd/Fall Semesters), each ordinarily having duration of not less than 14 (fourteen) weeks of classes. There shall be a Mid-Semester Examination at about middle of each Semester and a Semester Final Examination at the end of each Semester. The examination will be conducted as per Academic regulations.

Guide line for Classes and Examinations in a Semester:

Total Class in a Semester = 14 weeks
Recess before Mid-Semester and Semester Final Exams. = 2 weeks
Time for Mid-Semester and Semester Final Exams. = about 4 weeks
Publication of Results + Inter-Semester Recess = 2 weeks

Minimum Requirements for the Degree:
  (i)   Completion of 162.00 credits.
  (ii) Passing courses individually and maintaining min. CGPA of 2.25 out of 4.00.

Evaluation System: Continuous Assessment   = 30%
                     Mid-Semester Exam.   = 30%
                     Semester Final Exam.   = 40%

***Continuous Assessment* = Class Tests + Assignments/Quiz + Attendance and Class Performance.**

Grading System:

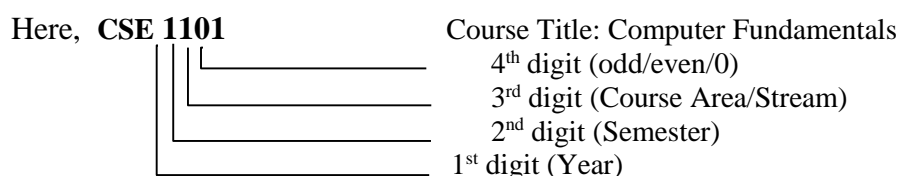| Numerical grade	Letter Grade	Grade point
80% or above	A+ (A plus)	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A- (A minus)	3.50
65% to less than 70%	B+ (B plus)	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B- (B minus)	2.75
50% to less than 55%	C+ (C plus)	2.50
45% to less than 50%	C	2.25
40% to less than 45 %	D	2.00
Less than 40%	F	0.00

Course Designation and Course Code Numbering Systems:

Each course is designated by a three letter code (e.g. CSE) identifying the course offering department or course related department followed by a four- digit number with the following criteria:
  (i)   CSE defines the departmental identification code (Computer Science and Engineering).

(ii)   The first digit will correspond to the Year (e.g. 1 for 1st year, 2 for 2nd year, 3 for 3rd year, etc.) in which the students normally take the course.

(iii)   The second digit will correspond to the Semester (1 for 1st semester and 2 for 2nd semester) in which the course is normally taken by the students.

(iv)   The third digit will correspond the departmental course of any area/stream.

(v)   The fourth or last digit designates the course type (odd digit for theory, even digit for sessional/design studio and 0 digit for the sessional course without theory course. If there are no sessional courses, then both odd and even digits can be used for theory courses)

(vi)   There is a blank space between departmental code CSE and first digit.

Example for a Typical Course Code No.:

Here, **CSE 1101**   Course Title: Computer Fundamentals
                                        4th digit (odd/even/0)
                                        3rd digit (Course Area/Stream)
                                        2nd digit (Semester)
                                        1st digit (Year)

N.B.:

(1) Project & Thesis/Thesis/Dissertation course shall be designated by the departmental identification code followed by 4000 (viz. CSE 4000) for 4-year Engineering Programs applicable for last two semesters (minimum one-year duration) as per rules of UGC/BAC (Bangladesh Accreditation Council). For other Programs, the course code no. and placement of this course in syllabus should be fixed as per rules of UGC/BAC.

(2) Teaching for the courses is reckoned in credits and the credits allotted to various courses will be determined by the ACUG (Academic Committee of Undergraduate) with the following guidelines:

Sl.	Type of Course	Contact Hour/week	Credit
(i)	Theory/Lecture (Taught)/ Seminar (Discussion)	1.0	1.00
(ii)	Tutorial/ Practice	1.0	1.00
(iii)	Independent Lab/Sessional/Design/ Special Study Elective (Studio)	1.5 / 2.0	0.75 / 1.00
(iv)	Project & Thesis/Thesis/ Dissertation	2.0	1.00
(v)	Design Studio	1.5	1.00
(vi)	Field Work/Field Survey	2 weeks of field work	1.00
(vii)	Industrial Attachment (after completed all courses)	One to Three months	As per approved by UGC
(viii)	Internship (after completed all courses)	As per approved by UGC	As per approved by UGC
(ix)	Internship (within study period) #	As per approved by UGC	Non-credit for B. Arch

N.B.: 1.0 contact hour = Lecture of 50 minutes.

For B. Arch.: Internship will start only after successful completion of 3rd year under a full IAB member or one recognized by the national architectural professional body in a foreign nation. Here total 40 contact hours = 7.5 weeks.

Part A
1. **Title of the Academic Program:** B. Sc. in Computer Science and Engineering (CSE)
2. **Name of the University:** Sonargaon University (SU)
3. **Vision of the University:**

To become a Center of Excellence comparable to the best in the world for producing professionals who shall be leaders in technology, innovation, entrepreneurship and management.

4. **Mission of the University:**

Mission 1: The Sonargaon University's mission as a young research university is to achieve the highest standards of international excellence in research and teaching, while also fully meeting its distinctive responsibilities as the country's sole private institution of higher education.

Mission 2: The University students and staff have the opportunity to develop the skills, judgement and independence necessary to be engaged citizens and to assume active leadership roles in societal and economic life.

Mission 3: The production of knowledge, which will always remain the prime mission of a university, implies creativity enhancing conditions allowing a focus on the essentials, as it needs the freedom to experiment and to devise innovative, special and disruptive solutions.

Mission 4: It provides a unique forum for the development of the cultural, political and social dialogues that are the lifeblood of a mature democracy.

Mission 5: The University develops activities in fields that contribute to priority areas of national, social and economic development, for the benefit of the competitiveness of Bangladesh.

5. **Name of the Program Offering Entity:**
   Department of Computer Science and Engineering (CSE), Faculty of Science and Engineering, Sonargaon University (SU), Dhaka.

6. **Vision of the Program Offering Entity:**

To be a leading department to ensure the creation, preservation, and dissemination of knowledge by focusing on creating the most facilitative atmosphere for quality academic and research-oriented undergraduate education in computer science and engineering (CSE). Department ensures qualifying the students for a globalized technological society and orienting them towards serving the nation and the world.

7. Mission of the Program Offering Entity:

The department of Computer Science and Engineering (CSE) strives for excellence in teaching, research and service with the following missions in mind-

- To prepare liberally educated, eloquent, and proficient computer scientists and software engineers for leadership and professional careers and higher study.
- To build successful graduates with personal and professional duties and devotion to lifelong learning.
- To enable students in attaining required ethics with an attitude of entrepreneurial skills, moral values, and social consciences.
- To empower the youth in technological communities and build social networks with computer education.
- To establish nationally and internationally recognized research centers and expose the students to broad research experience.

8. Objectives of the Program Offering Entity:

- Introducing the students to the compelling world of reasoning, rationalization, and decision making through quality materials.
- Introducing students to various development, analysis, and synthesis tools will engage them in research early in their studies.
- Provide students with a deeper understanding of the engineering issues and trade-offs that cross disciplines to understand the social, political, economic, and environmental impact of their decisions.
- Ensuring that students are kept up-to-date with knowledge and practice of the most current tools and techniques.
- To promote innovative and original thinking in building engineers to face the challenges of the future.

9. Name of Degree: B. Sc. in Computer Science and Engineering (CSE)

10. Description of the Program

The department of Computer Science and Engineering (CSE) offers four-year undergraduate program titled Bachelor of Science (B. Sc.) in Computer Science and Engineering (CSE). The program will make the students capable in identifying, formulating and solving computer science and engineering problems that meet specified performance, security, reliability cost, time and other quality needs. Apart from the essential knowledge in Mathematics, Statistics, Programming, CSE theories, and labs, this program also offers the students to acquire knowledge in a specialized sector. This program also emphasizes on industry and research-based projects, which would enhance their skills to become successful professionals for a holistic development.

11. Graduate Attributes

Graduate Attributes related to core knowledge:
- Engineering knowledge
- Problem analysis
- Design/development of solutions
- Conduct investigations of complex problems

Graduate Attributes related to Skills:
- Modern tool usage
- Environment and sustainability
- Communication
- Project management and finance

Graduate Attributes related to behavior
- Ethics
- The engineer and society
- Individual and team work
- Lifelong learning

12. Program Educational Objectives (PEOs)

PEO 1: Acquire fundamental to advance knowledge of computer science utilizing mathematics, science, and engineering to perform state-of-art research activities.

PEO 2: Able to relate their knowledge and skills to succeed in their future life as well as gain higher degrees and productively engage in research work and lifelong learning.

PEO 3: Excel as professionals by building upon the problem-solving skills, innovations, communicate effectively, and behave ethically and responsibly.

PEO 4: Getting employed in the computing profession and applying new ideas and technologies as the field evolves.

13. Program Learning Outcomes (PLOs)

PLO 1: Ability to gather and apply knowledge of mathematics, science, and engineering

PLO 2: Ability to design, analyze and develop computing systems within realistic constraints

PLO 3: Ability to conduct, evaluate, and interpret experiments

PLO 4: Ability to work on multidisciplinary teams and develop leadership

PLO 5: Ability to identify, create, and solve engineering problems

PLO 6: Practice behaving professionally and ethically

PLO 7: Ability to communicate effectively on complex engineering activities

PLO 8: Ability to understand the impact of engineering solutions

PLO 9: Apply contextual knowledge to assess societal, health, safety, legal, and cultural issues

PLO 10: Apply appropriate techniques, resources, modern engineering and IT tools

PLO 11: Demonstrate knowledge and understand principles of engineering and management to manage projects

PLO 12: Able to engage in Lifelong learning

14. Mapping mission of the university with PEOs

PEOs	Mission 1	Mission 2	Mission 3	Mission 4	Mission 5
PEO 1	√				√
PEO 2	√	√	√		
PEO 3			√		√
PEO 4		√	√	√	

15. Mapping PLOs with PEOs

PLOs	PEO1	PEO2	PEO3	PEO4
PLO 1	√	√		
PLO 2		√		√
PLO 3	√		√	
PLO 4			√	√
PLO 5		√		
PLO 6			√	
PLO 7			√	
PLO 8		√		
PLO 9			√	√
PLO 10	√	√		√
PLO 11			√	√
PLO 12	√	√		

16. Mapping Courses with the PLOs

Course Code	Course Title	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12
CSE 1101	Computer Fundamentals	√	√			√			√		√		
CSE 1102	Computer Fundamentals Sessional	√	√			√			√		√		
CSE 1201	Structured Programming Language	√	√	√	√	√							
CSE 1202	Structured Programming Language Sessional		√	√		√					√	√	
CSE 1203	Discrete Mathematics	√	√			√			√				√
CSE 2101	Object-Oriented Programming I (Preq CSE 1201)	√	√	√				√			√		
CSE 2102	Object-Oriented Programming I Sessional	√	√					√			√	√	
CSE 2201	Digital Logic Design	√	√	√		√					√		
CSE 2202	Digital Logic Design Sessional	√	√	√		√						√	
CSE 2203	Data Structure (Preq CSE 1201)	√	√	√		√							√
CSE 2204	Data Structure Sessional	√		√		√					√		√
CSE 2205	Database Management System	√	√	√		√					√		
CSE 2206	Database Management System Sessional	√	√	√		√					√		
CSE 2207	Theory of Computation	√	√	√							√		√
CSE 3100	Web Programming Sessional	√		√		√	√				√		
CSE 3101	Microprocessor and Assembly Language Programming	√		√		√							√
CSE 3102	Microprocessor and Assembly Language Programming Sessional	√	√	√									√
CSE 3103	Algorithms (Preq CSE 1201)	√	√	√		√					√		
CSE 3104	Algorithms Sessional	√	√	√		√					√		
CSE 3105	Numerical Methods		√			√		√				√	√
CSE 3106	Numerical Methods Sessional	√				√		√			√		√

Code	Course	1	2	3	4	5	6	7	8	9	10	11	12
CSE 3109	Data Communications	√	√			√			√		√		
CSE 3111	Computer Architecture	√	√	√	√	√							
CSE 3200	Mobile Application Development Sessional	√	√			√					√	√	
CSE 3201	Computer Networks (Preq CSE 3109)	√	√	√		√					√		
CSE 3202	Computer Networks Sessional	√	√	√		√					√		
CSE 3203	Operating System	√	√	√							√	√	
CSE 3204	Operating System Sessional	√	√	√							√	√	
CSE 3205	Object-Oriented Programming II (Preq CSE 2101)	√	√			√							√
CSE 3206	Object-Oriented Programming II Sessional	√	√			√					√		√
CSE 4000	Project and Thesis		√	√	√	√					√		
CSE 4100	Technical Writing and Presentation	√	√			√					√		√
CSE 4101	Software Engineering		√			√			√		√	√	
CSE 4102	Software Engineering Sessional		√			√			√		√	√	
CSE 4103	Artificial Intelligence	√				√			√		√		√
CSE 4104	Artificial Intelligence Sessional	√				√			√		√		√
CSE 4201	Computer and Cyber Security	√	√	√							√		√
CSE 4203	Information System Analysis and Design	√			√			√					√
CSE 4105	Mathematical Analysis for Computer Science	√		√		√			√		√		
CSE 4107	Graph Theory	√		√		√			√		√		
CSE 4109	Compiler Design	√		√		√			√			√	
CSE 4111	Computational Geometry	√		√		√			√		√		
CSE 4113	Wireless and Cellular Communication	√		√		√			√			√	
CSE 4115	Bioinformatics	√	√	√		√			√				
CSE 4117	Big Data and Analytics	√	√	√		√					√		
CSE 4119	Simulation and Modeling	√	√	√		√					√		
CSE 4121	Distributed Systems	√	√			√							√
CSE 4123	Cloud Computing	√	√					√					√

CSE 4125	Human Computer Interaction	√	√			√					√		√
CSE 4127	Software Architecture	√	√			√			√				
CSE 4129	Software Testing and Quality Assurance	√	√	√		√					√		
CSE 4131	Enterprise Systems: Concepts and Practice	√	√		√		√	√					
CSE 4133	Web Application Security	√	√			√					√		√
CSE 4135	Electronic Business	√	√		√		√				√		
CSE 4205	Algorithm Engineering		√	√		√					√	√	
CSE 4206	Algorithm Engineering Sessional	√	√	√							√	√	
CSE 4207	Machine Learning and Pattern Recognition	√	√			√					√		√
CSE 4208	Machine Learning and Pattern Recognition Sessional	√	√			√					√		
CSE 4211	Data Mining	√	√	√		√					√		
CSE 4212	Data Mining Sessional	√	√	√		√							
CSE 4213	Computer Graphics	√		√		√			√		√		
CSE 4214	Computer Graphics Sessional		√	√		√			√		√		
CSE 4215	Computer Peripherals and Interfacing	√	√	√		√			√				
CSE 4216	Computer Peripherals and Interfacing Sessional	√		√		√			√		√		
CSE 4217	Digital System Design	√	√	√		√					√		
CSE 4218	Digital System Design Sessional	√	√	√		√					√		
CSE 4221	Digital Image Processing and Computer Vision	√	√	√		√					√		
CSE 4222	Digital Image Processing and Computer Vision Sessional	√	√			√				√	√		
CSE 4223	Embedded Systems	√	√			√		√			√		
CSE 4224	Embedded Systems Sessional	√	√	√		√					√		
CSE 4225	VLSI Design	√	√			√					√		√
CSE 4226	VLSI Design Sessional	√	√			√					√		√
CSE 4227	Topics of Current Interest												

Code	Course Title												
CSE 4228	Topics of Current Interest Sessional												
Hum 1201	Composition, Writing and Communication				√		√	√		√			√
Hum 2101	বাংলাদেশের অভ্যুদয় (History of Emergence of Bangladesh)												√
Hum 2103	English Skills Practices						√	√					√
Hum 2201	Professional Ethics and Environmental Protection				√		√	√		√			√
Hum 3201	Engineering Economics	√				√				√	√		√
Hum 3203	Financial and Managerial Accounting			√				√		√	√	√	
Math 1101	Mathematics I	√				√							
Math 1201	Mathematics II	√				√							
Math 2101	Mathematics III	√				√							
Math 2201	Mathematics IV	√				√							
ME 2100	Engineering Drawing Sessional	√	√			√			√		√		
Phy 1101	Physics I	√	√	√								√	
Phy 1201	Physics II	√	√									√	√
Phy 1202	Physics II Sessional	√		√		√			√				
BA 4101	Industrial and Operational Management				√				√	√	√	√	
Ban 1201	বাংলা ভাষা ও সাহিত্য (Bengali Language and Literature)							√					√
Chem 1101	Chemistry	√	√	√						√		√	
Chem 1102	Chemistry Sessional	√	√		√				√	√			
EEE 1101	Electrical Engineering and Circuit Analysis	√		√								√	√
EEE 1102	Electrical Engineering and Circuit Analysis Sessional	√		√				√					√
EEE 2101	Electronic Engineering	√		√		√			√		√		
EEE 2102	Electronic Engineering Sessional	√		√		√					√	√	

Part B

17. Structure of the curriculum:

a) **Duration of the program:** Years: 4   Semester: 8

b) **Admission Requirements:**

   (i)   A student should have at least second division or minimum GPA 2.50 in both SSC/O-Level or equivalent and HSC/A-Level or equivalent examinations. If minimum GPA is 2.00 in any of the examinations, then total GPA of both SSC/O-Level or equivalent and HSC/A-Level or equivalent examinations must be 6.00.

   (**OR**) A diploma student should have minimum GPA 2.50 in both SSC/O-Level or equivalent and Diploma examinations. If minimum GPA is 2.00 in either SSC/O-Level or Diploma then total GPA of both SSC and Diploma examinations must be 6.00.

   (**OR**) A student should have 5 (Five) subjects in "O" Level and 2 (Two) subjects in "A" Level. Out of these seven subjects in these two examinations, Grade B or GPA 4.0 in any four subjects and Grade C or GPA 3.50 in other three subjects (using scale of A = 5, B = 4, C = 3, D = 2, E= 1).

   (**OR**) Minimum CGPA of 2.5 in O-Level in five subjects and A-Level in two subjects separately, according to the scale (A=5, B=4, C =3 and D = 2). Subjects with E-grade will not be considered.

   (**OR**) In case of freedom fighter's Quota total GPA in both SSC/O-Level or equivalent and HSC/A-Level or equivalent examinations must be 5.00.

   (**OR**) In case of Music, Fashion Design, Fine Arts, Graphic Design, Library Science and Information program/courses minimum GPA in both SSC/O-Level or equivalent and HSC/A-Level or equivalent examinations must be 2.00.

   (ii)   Any candidate of Humanities or Business Studies in HSC/A-level or equivalent will not be allowed to submit application for Engineering and Architecture departments/programs.

   (iii)   For the programs of Eng. and Arch, the candidates must pass in Physics, Chemistry and Mathematics at HSC/A-level/Diploma or equivalent examinations; but at SSC/O-Level they may be students of Humanities or Business Studies.

(iv) Candidate of GED diploma holders will not be allowed for admission. However, the candidate must also fulfill all other requirements as may be prescribed by the Academic Council on the recommendation of the Admission Committee. In case of confusion regarding the equivalence the case may be referred to Central Equivalence Committee.

c) **Total minimum credit requirement to complete the program:** 162.00

d) **Total class weeks in a semester:** 14

e) **Minimum CGPA requirements for graduation:** 2.25

f) **Maximum academic years of completion:** 6

g) **Category of Courses:**

	Categories of Courses	**Required Credits**
i.	General Education Courses	42.00
ii.	Core Subjects	94.50
iii.	Elective Subjects	19.50
iv.	Project and Thesis	06.00
	Total	162.00

18. Semester wise distribution of courses

1st Year 1st Semester

Sl.	Course Code	Course Title	Theory		Sessional		Total credits
			Contact hrs/week	Credits	Contact hrs/week	Credits	
1.	Math 1101	Mathematics I	3.0	3.00	–	–	3.00
2.	Phy 1101	Physics I	3.0	3.00	–	–	3.00
3.	Chem 1101	Chemistry	3.0	3.00	–	–	3.00
4.	Chem 1102	Chemistry Sessional	–	–	3.0	1.50	1.50
5.	EEE 1101	Electrical Engineering and Circuit Analysis	3.0	3.00	–	–	3.00
6.	EEE 1102	Electrical Engineering and Circuit Analysis Sessional	–	–	3.0	1.50	1.50
7.	CSE 1101	Computer Fundamentals	2.0	2.00	–	–	2.00
8.	CSE 1102	Computer Fundamentals Sessional	–	–	3.0	1.50	1.50
		Total	15.0	15.00	9.0	4.50	18.50

Contact hours: 15 (T) + 9 (S) = 24.0 hrs/week   No. of theory courses   : 5

Total credits: 18.50   No. of sessional courses   : 3

N.B.: Any student of a 4-year diploma in engineering, willing to obtain exemption of the courses of 1st Year 1st Semester, will have to submit an application to the Head of the concerned Department for approval.

1st Year 2nd Semester

Sl.	Course Code	Course Title	Theory		Sessional		Total credits
			Contact hrs/week	Credits	Contact hrs/week	Credits	

1.	Ban 1201	বাংলা ভাষা ও সাহিত্য (Bengali Language and Literature)	2.0	2.00	–	–	2.00
2.	Hum 1201	Composition, Writing and Communication	3.0	3.00	–	–	3.00
3.	Phy 1201	Physics II	3.0	3.00	–	–	3.00
4.	Phy 1202	Physics II Sessional	–	–	3.0	1.50	1.50
5.	Math 1201	Mathematics II	3.0	3.00	–	–	3.00
6.	CSE 1201	Structured Programming Language	3.0	3.00	–	–	3.00
7.	CSE 1202	Structured Programming Language Sessional	–	–	3.0	1.50	1.50
8.	CSE 1203	Discrete Mathematics	3.0	3.00	–	–	3.00
		Total	17.0	17.00	6.0	3.00	20.00

Contact hours: 17 (T) + 6 (S) = 23.0 hrs/week   No. of theory courses   : 6

Total credits: 20.00   No. of sessional courses   : 2

2nd Year 1st Semester

Sl.	Course Code	Course Title	Theory		Sessional		Total credits
			Contact hrs/week	Credits	Contact hrs/week	Credits	
1.	Hum 2101	বাংলাদেশের অভ্যুদয় (History of Emergence of Bangladesh)	3.0	3.00	–	–	3.00
2.	Hum 2103	English Skills Practices	2.0	2.00	–	–	2.00
3.	Math 2101	Mathematics III	3.0	3.00	–	–	3.00
4.	ME 2100	Engineering Drawing Sessional	–	–	3.0	1.50	1.50
5.	EEE 2101	Electronic Engineering	3.0	3.00	–	–	3.00
6.	EEE 2102	Electronic Engineering Sessional	–	–	3.0	1.50	1.50
7.	CSE 2101	Object-Oriented Programming I (Preq CSE 1201)	3.0	3.00	–	–	3.00
8.	CSE 2102	Object-Oriented Programming I Sessional	–	–	3.0	1.50	1.50
		Total	14.0	14.00	9.0	4.50	18.50

Contact hours: 14 (T) + 9 (S) = 23.0 hrs/week   No. of theory courses : 5

Total credits: 18.50,   Preq = Pre-requisite   No. of sessional courses : 3

2nd Year 2nd Semester

Sl.	Course Code	Course Title	Theory		Sessional		Total credits
			Contact hrs/week	Credits	Contact hrs/week	Credits	
1.	Hum 2201	Professional Ethics and Environmental Protection	2.0	2.00	–	–	2.00
2.	Math 2201	Mathematics IV	3.0	3.00	–	–	3.00
3.	CSE 2201	Digital Logic Design	3.0	3.00	–	–	3.00
4.	CSE 2202	Digital Logic Design Sessional	–	–	3.0	1.50	1.50

Sl.	Course Code	Course Title	Theory Contact hrs/week	Theory Credits	Sessional Contact hrs/week	Sessional Credits	Total credits
5.	CSE 2203	Data Structure (Preq CSE 1201)	3.0	3.00	–	–	3.00
6.	CSE 2204	Data Structure Sessional	–	–	3.0	1.50	1.50
7.	CSE 2205	Database Management System	3.0	3.00	–	–	3.00
8.	CSE 2206	Database Management System Sessional	–	–	3.0	1.50	1.50
9.	CSE 2207	Theory of Computation	3.0	3.00	–	–	3.00
		Total	17.0	17.00	9.0	4.50	21.50

Contact hours: 17 (T) + 9 (S) = 26.0 hrs/week   No. of theory courses   : 6

Total credits: 21.50, Preq = Pre-requisite   No. of sessional courses   : 3

3rd Year 1st Semester

Sl.	Course Code	Course Title	Theory Contact hrs/week	Theory Credits	Sessional Contact hrs/week	Sessional Credits	Total credits
1.	CSE 3101	Microprocessor and Assembly Language Programming	3.0	3.00	–	–	3.00
2.	CSE 3102	Microprocessor and Assembly Language Programming Sessional	–	–	3.0	1.50	1.50
3.	CSE 3103	Algorithms (Preq CSE 1201)	3.0	3.00	–	–	3.00
4.	CSE 3104	Algorithms Sessional	–	–	3.0	1.50	1.50
5.	CSE 3105	Numerical Methods	3.0	3.00	–	–	3.00
6.	CSE 3106	Numerical Methods Sessional	–	–	3.0	1.50	1.50
7.	CSE 3100	Web Programming Sessional	–	–	3.0	1.50	1.50
8.	CSE 3109	Data Communications	3.0	3.00	–	–	3.00
9.	CSE 3111	Computer Architecture	3.0	3.00	–	–	3.00
		Total	15.0	15.00	12.0	6.0	21.00

Contact hours: 15 (T) + 12 (S) = 27.0 hrs/week   No. of theory courses   : 5

Total credits: 21.00, Preq = Pre-requisite   No. of sessional courses   : 4

3rd Year 2nd Semester

Sl.		Course Title	Theory	Sessional	

	Course Code		Contact hrs/week	Credits	Contact hrs/week	Credits	Total credits
1.	Hum 3201	Engineering Economics	2.0	2.00	–	–	2.00
2.	Hum 3203	Financial and Managerial Accounting	2.0	2.00	–	–	2.00
3.	CSE 3201	Computer Networks (Preq CSE 3109)	3.0	3.00	–	–	3.00
4.	CSE 3202	Computer Networks Sessional	–	–	3.0	1.50	1.50
5.	CSE 3203	Operating System	3.0	3.00	–	–	3.00
6.	CSE 3204	Operating System Sessional	–	–	3.0	1.50	1.50
7.	CSE 3205	Object-Oriented Programming II (Preq CSE 2101)	3.0	3.00	–	–	3.00
8.	CSE 3206	Object-Oriented Programming II Sessional	–	–	3.0	1.50	1.50
9.	CSE 3200	Mobile Application Development Sessional	–	–	3.0	1.50	1.50
		Total	13.0	13.00	12.0	6.00	19.00

Contact hours: 13 (T) + 12 (S) = 25.0 hrs/week

No. of theory courses : 5

Total credits: 19.00, Preq = Pre-requisite

No. of sessional courses : 4

4th Year 1st Semester

Sl.	Course Code	Course Title	Theory		Sessional		Total credits
			Contact hrs/week	Credits	Contact hrs/week	Credits	
1.	CSE 4000	Project and Thesis	–	–	6.0	3.00	*3.00
2.	BA 4101	Industrial and Operational Management	2.0	2.00	–	–	2.00
3.	CSE 4100	Technical Writing and Presentation	–	–	3.0	1.50	1.50
4.	CSE 4101	Software Engineering	3.0	3.00	–	–	3.00
5.	CSE 4102	Software Engineering Sessional	–	–	2.0	1.00	1.00
6.	CSE 4103	Artificial Intelligence	3.0	3.00	–	–	3.00
7.	CSE 4104	Artificial Intelligence Sessional	–	–	3.0	1.50	1.50
8.	CSE 41XX	Select one course from option I	3.0	3.00	–	–	3.00
9.	CSE 41XX	Select one course from option II	3.0	3.00	–	–	3.00
		Total	14.0	14.00	14.0	7.00	21.00

Contact hours: 14 (T) + 14 (S) = 28.0 hrs/week   No. of theory courses   : 5

Total credits: 21.00   No. of sessional courses   : 4

* This credit in addition to 3.00 credits of 4th Year 2nd Semester for project and thesis will be assessed at the end of 4th Year 2nd Semester.

Option	Course Code	Course Title	Theory hrs/week	Sessional hrs/week	Credits
I	CSE 4105	Mathematical Analysis for Computer Science	3.0	–	3.00
	CSE 4107	Graph Theory	3.0	–	3.00
	CSE 4109	Compiler Design	3.0	–	3.00
	CSE 4111	Computational Geometry	3.0	–	3.00
	CSE 4113	Wireless and Cellular Communication	3.0	–	3.00
	CSE 4115	Bioinformatics	3.0	–	3.00
	CSE 4117	Big Data and Analytics	3.0	–	3.00
II	CSE 4119	Simulation and Modeling	3.0	–	3.00
	CSE 4121	Distributed Systems	3.0	–	3.00
	CSE 4123	Cloud Computing	3.0	–	3.00
	CSE 4125	Human Computer Interaction	3.0	–	3.00
	CSE 4127	Software Architecture	3.0	–	3.00
	CSE 4129	Software Testing and Quality Assurance	3.0	–	3.00
	CSE 4131	Enterprise Systems: Concepts and Practice	3.0	–	3.00
	CSE 4133	Web Application Security	3.0	–	3.00
	CSE 4135	Electronic Business	3.0	–	3.00

From optional courses, students shall take two optional thesis related theory courses from optional group of I to II and three more optional theory courses and the corresponding sessional course from optional group of III to V.

4th Year 2nd Semester

Sl.	Course Code	Course Title	Theory		Sessional		Total credits
			Contact hrs/week	Credits	Contact hrs/week	Credits	
1.	CSE 4000	Project and Thesis	–	–	6.0	3.00	3.00
2.	CSE 4201	Computer and Cyber Security	3.0	3.00	–	–	3.00
3.	CSE 4203	Information System Analysis and Design	3.0	3.00	–	–	3.00
4.	CSE 42XX	Any one set from option III	3.0	3.00	–	–	3.00
5.	CSE 42XX		–	–	3.0	1.50	1.50
6.	CSE 42XX	Any one set from option IV	3.0	3.00	–	–	3.00

#	Course Code	Course Title					
7.	CSE 42XX		–	–	3.0	1.50	1.50
8.	CSE 42XX	Any one set from option V	3.0	3.00	–	–	3.00
9.	CSE 42XX		–	–	3.0	1.50	1.50
		Total	15.0	15.0	15.00	7.50	22.50

Contact hours: 15 (T) + 15 (S) = 30.0 hrs/week   No. of theory courses : 5

Total credits: 22.50   No. of sessional courses : 4

Option	Set	Course Code	Course Title	Theory Credit	Sessional Credit	Credits
III	1	CSE 4205	Algorithm Engineering	3.00	–	4.50
		CSE 4206	Algorithm Engineering Sessional	–	1.50	
	2	CSE 4207	Machine Learning and Patter Recognition	3.00	–	4.50
		CSE 4208	Machine Learning and Patter Recognition Sessional	–	1.50	
	3	CSE 4211	Data Mining	3.00	–	4.50
		CSE 4212	Data Mining Sessional	–	1.50	
IV	1	CSE 4213	Computer Graphics	3.00	–	4.50
		CSE 4214	Computer Graphics Sessional	–	1.50	
	2	CSE 4215	Computer Peripherals and Interfacing	3.00	–	4.50
		CSE 4216	Computer Peripherals and Interfacing Sessional	–	1.50	4.50
	3	CSE 4217	Digital System Design	3.00	–	4.50
		CSE 4218	Digital System Design Sessional	–	1.50	
V	1	CSE 4221	Digital Image Processing and Computer Vision	3.00	–	4.50
		CSE 4222	Digital Image Processing and Computer Vision Sessional	–	1.50	
	2	CSE 4223	Embedded Systems	3.00	–	4.50
		CSE 4224	Embedded Systems Sessional	–	1.50	
	3	CSE 4225	VLSI Design	3.00	–	4.50
		CSE 4226	VLSI Design Sessional	–	1.50	
	4	CSE 4227	Topics of Current Interest	3.00	–	4.50
		CSE 4228	Topics of Current Interest Sessional	–	1.50	