# North Bengal International University

## Faculty of Science and Engineering
**Department of Computer Science and Engineering**
Syllabus for 4-Year B.Sc. in Computer Science and Engineering
Semester : 12

# Department of Computer Science and Engineering

## 1. Mission and Vision:

Aim of the B.Sc. (Engg.) in Computer Science and Engineering is to provide the graduates with the knowledge of Computer Science and Engineering so as to meet the challenges of job market and prove their skillness in Computer Science and Engineering. The curriculum is designed following the international standard. The graduates are given theoretical knowledge along with practical knowledge in the field of Computer Science and Engineering such as structured programming C, OOP with C++ and JAVA, Computer Networking, Compiler Design, Microprocessor, Operating System and so on with the expectation that the graduates of this department can fit themselves in academic field as well the fields related to Computer Science and Engineering.

## 2. Admission requirements:

The minimum qualifications for admission into the undergraduate program are:
A. Higher Secondary Certificate (H.S.C) for its equivalent in Science with Mathematics, Physics, and Chemistry.
B. The O-A Level students must have an average grade of B, and also
C. Fulfilling any other conditions fixed by the authority.

## 3. Credit Hours:

Teaching for the courses is reckoned in credits and the credits allotted to various courses are on the following guidelines:

| Nature of Course | Contact hour | No. of Credit |
|---|---|---|
| i) Theory Lecture | 1 hour/week | 1 |
| ii) Tutorial | 1 hour/week | 1 |
| iii) Independent Lab/ Sessional/ Design | 2 hour/week 3 hour/week | 1 1.5 |
| iv) Project/ Thesis | 2 hour/ week | 1 |

## 4. Grading and Point System:

### 4.1 Grading System:

The letter grade system shall be used to assess the performance of the student and shall be as follows:

| Numerical Grade | Letter Grade | Grade Point |
|---|---|---|
| 80% or above | A+ | 4.0 |
| 75% to less than 80% | A | 3.75 |
| 70% to less than 75% | A- | 3.5 |
| 65% to less than 70% | B+ | 3.25 |
| 60% to less than 65% | B | 3.0 |
| 55% to less than 60% | B- | 2.75 |
| 50% to less than 55% | C+ | 2.5 |
| 45% to less than 50% | C | 2.25 |
| 40% to less than 45% | D | 2.0 |
| Less than 40% | F | 0 |
| **Incomplete** | I | - |

A grade 'I' shall be awarded for courses (like project & thesis, design, etc.) in the 4th year 1st semester which continue through to the 4th year 3rd semester.

### 4.2.Point System:

Grade Point Average (GPA) is the weighted average in a semester. 'F' grades do not count for GPA calculation. GPA of a semester will be calculated as follows:

$$\text{Grade Point Average} = \frac{\sum_{i=1}^{n} C_i G_i}{\sum_{i=1}^{n} C_i}$$

Where n is the total number of courses passed by the student in the semester, $C_i$ is the number of credits allotted to a particular course i and $G_i$ is the grade point corresponding to the grade awarded for i- th course.

The overall or Cumulative Grade Point Average (CGPA) gives the cumulative performance of the student from first semester up to any other semester to which it refers and is computed by dividing the total grade points ($\Sigma C_i G_i$) accumulated up to the date by the total credit ($\Sigma C_i$). Both GPA and CGPA will be rounded off to the second place of decimal for reporting.

## 5. Distribution of Marks:

The distribution of marks for a given course is as follows:

**Theory Courses:**

| | | |
|---|---|---|
| Class Attendance | : | **5%** |
| Class Performance | : | **5%** |
| Quizzes/Class tests | : | **10%** |
| Assignment | : | **10%** |
| Mid Term | : | **20%** |
| Term Final | : | **50%** |
| **Total** | **:** | **100%** |

**Sessional Courses:**

| | | |
|---|---|---|
| Class Attendance | : | **5%** |
| Class  Performance | : | **5%** |
| Quiz/Lab test | : | **15%** |
| Report Submission | : | **50%** |
| Viva voce (conducted by course teacher) | : | **25%** |
| **Total** | **:** | **100%** |

**Project and Thesis:**

| | | |
|---|---|---|
| Viva voce (conducted by a viva voce committee) | : | **20%** |
| Supervisor (internal examiner) | : | **50%** |
| External examiner | : | **30%** |
| **Total** | **:** | **100%** |

## 5.1 Basis for awarding marks for class participation and attendance will be as follows:

| Attendance | Marks |
|---|---|
| 90% and above | 5% |
| 85% to less than 90% | 4.5% |
| 80% to less than 85% | 4% |
| 75% to less than 80% | 3.5% |
| 70% to less than 75% | 3% |
| 65% to less than 70% | 2.5% |
| 60% to less than 65% | 2% |
| Less than 60% | 0% |

## 6. Credit Transfer:

There shall be no admission on transfer in the 1st year 1st semester program. In special cases, students may be admitted into a higher class.

A student may be allowed to transfer all courses of this University completed by the student at other universities/institutions.

## 7. Course Designation and Numbering System:

Each course is designated by a three to four letter word identifying the department, which offers it following, by a four-digit number with the following criteria:

a. The 1st digit corresponds to the year in which the course is normally taken by the students.
b. The 2nd digit corresponds to the semester in which the course is normally taken by the students.
c. The 3rd and 4th digits are reserved for departmental use indicating major area.

The course designation system is illustrated by one example as shown below:

**Course No. CSE 1111**
**Course Title: Fundamental of Computer Systems**

**CSE 1111**
　　　　　　　Fundamental of Computer Systems
　　　　　→ 1st semester
　　　→ 1st year
　　→ Computer Science and Engineering
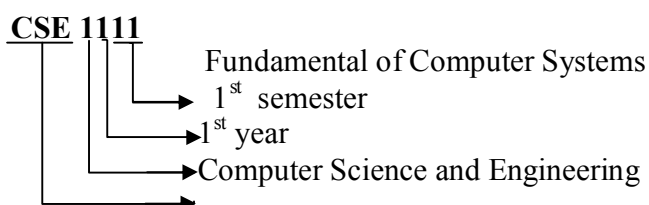
## 8. Course Load:

Students, serving in different organizations may be admitted as part-time students with a written consent from the employer.

A part-time student may be assigned a maximum of 9 credit hours of course work in a semester. A full-time student may be assigned a maximum of 17 credit hours per semester.

**9. Graduation Requirements:**

a. The total number of credits that a student has to complete successfully for the award of B.Sc. Engineering Degree is 156.
b. The minimum CGPA requirements for obtaining a Bachelor of Engineering Degree are 2.20.
c. A student may take additional courses with the consent of his/her head of the department in order to raise CGPA, but he/she may take a maximum of 15 such additional credits beyond respective credit requirements for bachelor's degree during his/her entire period of studentship.

**10. Time Limits of Completion of Bachelor's Degree:**

A student must complete his/her Bachelor's Degree within a maximum period of six years for engineering.

| **Chapter 1** | **Courses for B.Sc. in Computer Science & Engineering** |
|---|---|

## 1.1    Semester-wise distribution of credits

| Sl. No | Year/ Semester | Theory | | Sessional | | Total Credits |
|---|---|---|---|---|---|---|
| | | No of Course | Credits | No of Course | Credits | |
| 1 | 1st/1st | 4 | 11 | 1 | 1 | 12 |
| 2 | 1st/2nd | 4 | 10 | 1 | 1.5 | 12.5 |
| 3 | 1st/3rd | 4 | 12 | 3 | 3.5 | 14.5 |
| 4 | 2nd/1st | 4 | 12 | 3 | 3 | 15 |
| 5 | 2nd /2nd | 4 | 10 | 2 | 2 | 12 |
| 6 | 2nd/3rd | 3 | 8 | 2 | 2 | 10 |
| 7 | 3rd/1st | 3 | 9 | 3 | 3 | 12 |
| 8 | 3rd/2nd | 4 | 11 | 3 | 3 | 14 |
| 9 | 3rd /3rd | 4 | 11 | 3 | 3 | 14 |
| 10 | 4th/1st | 3 | 9 | 4 | 4 | 13 |
| 11 | 4th/2nd | 3 | 9 | 4 | 5 | 14 |
| 12 | 4th/3rd | 3 | 8 | 3 | 5 | 13 |
| | **Total** | **41** | **116** | **32** | **36** | **156** |

## 1.2    Summary of Undergraduate Course Plan

| Sl. No. | Course Type | | Credit | % |
|---|---|---|---|---|
| | **Departmental Courses** | | | |
| 1 | Core Courses | Theory | 77.0 | |
| | | Lab | 30.0 | |
| | Elective Courses | Theory | 6.0 | |
| | | Lab | 2.0 | |
| | | **Sub-Total** | **115.0** | **73.72%** |
| 2 | **Related Courses** | | | |
| | General Education | Theory | 10.0 | |
| | | **Sub-Total** | **10.0** | **6.41%** |
| | English | Theory | 2.0 | |
| | | **Sub-Total** | **2.0** | **1.28%** |
| | Mathematics & Statistics | Theory | 13.0 | |
| | | Lab | 1.0 | |
| | | **Sub-Total** | **14.0** | **8.97%** |
| | Basic Sciences | Theory | 6.0 | |
| | | Lab | 1.0 | |
| | | **Sub-Total** | **7.0** | **4.49%** |
| | Related Engineering | Theory | 6.0 | |
| | | Lab | 2.0 | |
| | | **Sub-Total** | **8.0** | **5.13%** |
| | **Total** | | **156** | **100%** |

## 1.3     List of Undergraduate Courses

### 1.3.2   General Education
** = For 1$^{st}$  year 2$^{nd}$  semester 21, 2$^{nd}$ year 2$^{nd}$ semester 22, 2$^{nd}$ year 3$^{rd}$ semester 23, 3$^{rd}$ year 2$^{nd}$ semester 32 & 3$^{rd}$  year 3$^{rd}$  semester 33. (Taking any Five from the Seven)

| Sl. No. | Course Number | Course Title | Contact Hrs/week | Credits |
|---|---|---|---|---|
| 1 | Hum **11 | Government and sociology | 2 | 2.0 |
| 2 | Hum **11 | Economics | 2 | 2.0 |
| 3 | Hum **11 | Industrial Management and Accountancy | 2 | 2.0 |
| 4 | HUM**11 | Intellectual Property and Cyber Law | 2 | 2.0 |
| 5 | Hum **11 | Introduction to Psychology | 2 | 2.0 |
| 6 | Hum **11 | Bangladesh Studies | 2 | 2.0 |
| | | **Total** | **10** | **10.0** |

### 1.3.3   English

| Sl. No. | Course Number | Course Title | Contact Hrs/week | Credits |
|---|---|---|---|---|
| 1 | ENG 1111 | English as Technical Language | 2 | 2.0 |
| | | **Total** | **2** | **2.0** |

### 1.3.4   Mathematics & Statistics

| Sl. No. | Course Number | Course Title | Contact Hrs/week | Credits |
|---|---|---|---|---|
| 1 | MATH1111 | Algebra, Trigonometry and Vector Analysis | 3 | 3.0 |
| 2 | MATH1211 | Differential and Integral Calculus | 2 | 2.0 |
| 3 | STAT1311 | Statistics for Engineers | 3 | 3.0 |
| 4 | MATH2111 | Matrices and Linear Algebra | 3 | 3.0 |
| 5 | MATH2211 | Numerical Analysis | 2 | 2.0 |
| 6 | MATH2212 | Numerical Analysis Sessional | 2 | 1.0 |
| | | **Total** | **15** | **14.0** |

### 1.3.5   Basic Science (Physics)

| Sl. No. | Course Number | Course Title | Contact Hrs/week | Credits |
|---|---|---|---|---|
| 1 | Phy 1311 | Electricity and Magnetism | 3 | 3.0 |
| 2 | Phy 1312 | Electricity and Magnetism Sessional | 2 | 1 |
| | | **Total** | **5** | **4.0** |

### 1.3.6   Basic Science (Chemistry)

| Sl. No. | Course Number | Course Title | Contact Hrs/week | Credits |
|---|---|---|---|---|
| 1 | Chem 1211 | Physical  and Inorganic Chemistry | 3 | 3.0 |
| | | **Total** | **3.0** | **3.0** |

### 1.3.1   Core Courses (CSE)

| Sl. No. | Course Number | Course Title | Credit |
|---|---|---|---|
| 1 | CSE1111 | Fundamental of Computer Systems | 3.0 |
| 2 | CSE1211 | Programming Technology with C | 3.0 |
| 3 | CSE1212 | Programming Technology with C Sessional | 1.5 |
| 4 | CSE1311 | Object Oriented Programming with C++ | 3.0 |
| 5 | CSE1312 | Object Oriented Programming with C++ Sessional | 1.5 |
| 6 | CSE2111 | Introduction to Digital Electronics | 3.0 |
| 7 | CSE2112 | Introduction to Digital Electronics  Sessional | 1.0 |
| 8 | CSE2121 | Digital Systems | 3.0 |
| 9 | CSE2122 | Digital Systems Sessional | 1.0 |
| 10 | CSE2131 | Data Structure | 3.0 |
| 11 | CSE2132 | Data Structure  Sessional | 1.0 |
| 12 | CSE2211 | Discrete Mathematics | 3.0 |
| 13 | CSE2221 | Object Oriented Technology with Java | 3.0 |
| 14 | CSE2222 | Object Oriented Technology with Java Sessional | 1.0 |
| 15 | CSE2311 | Analysis of Algorithms | 3.0 |
| 16 | CSE2312 | Analysis of Algorithms Sessional | 1.0 |
| 17 | CSE2321 | System Analysis and Design | 3.0 |
| 18 | CSE2322 | Software Development Sessional | 1.0 |
| 19 | CSE3111 | Computer Architecture and Organization | 3.0 |
| 20 | CSE3112 | Computer Architecture and Organization Sessional | 1.0 |
| 21 | CSE3121 | Database Management Systems | 3.0 |
| 22 | CSE3122 | Database Management Systems Sessional | 1.0 |
| 23 | CSE3131 | Compiler Design | 3.0 |
| 24 | CSE3132 | Compiler Design Sessional | 1.0 |
| 25 | CSE3211 | Computer Networks | 3.0 |

| 26 | CSE3212 | Computer Networks Sessional | 1.0 |
|----|---------|------------------------------|-----|
| 27 | CSE3221 | Software Engineering | 3.0 |
| 28 | CSE3222 | Software Engineering Sessional | 1.0 |
| 29 | CSE3231 | Computer Graphics | 3.0 |
| 30 | CSE3232 | Computer Graphics Sessional | 1.0 |
| 31 | CSE3311 | Digital Signal Processing | 3.0 |
| 32 | CSE3312 | Digital Signal Processing Sessional | 1.0 |
| 33 | CSE3321 | Microprocessor and Assembly Language | 3.0 |
| 34 | CSE3322 | Microprocessor and Assembly Language Sessional | 1.0 |
| 35 | CSE3331 | Operating Systems | 3.0 |
| 36 | CSE3332 | Operating Systems Sessional | 1.0 |
| 37 | CSE4111 | Parallel and Distributed Computing | 3.0 |
| 38 | CSE4112 | Parallel and Distributed Computing Sessional | 1.0 |
| 39 | CSE4121 | Computer Simulation and Modeling | 3.0 |
| 40 | CSE4122 | Computer Simulation and Modeling Sessional | 1.0 |
| 41 | CSE4131 | Computer Peripherals and Interfacing | 3.0 |
| 42 | CSE4132 | Computer Peripherals and Interfacing Sessional | 1.0 |
| 43 | CSE4292 | Thesis or Project (Part I) | 1.0 |
| 44 | CSE4211 | E-Commerce | 3.0 |
| 45 | CSE4212 | E-Commerce Sessional | 1.0 |
| 46 | CSE 4221 | Internet & Web Technology | 3.0 |
| 47 | CSE 4222 | Internet & Web Technology Sessional | 1.0 |
| 48 | CSE4292 | Thesis or Project (Part II) | 2.0 |
| 49 | CSE4311 | Artificial Intelligence | 3.0 |
| 50 | CSE4312 | Artificial Intelligence Sessional | 1.0 |
| 51 | CSE4321 | Management Information Systems | 2.0 |
| 52 | CSE4392 | Thesis or Project (Part III) | 3.0 |
| | | **Total** | **107.0** |

### 1.3.6 Engineering non-departmental Courses (EEE)

| Sl. No. | Course Number | Course Title | Contact Hrs/week | Credits |
|---------|---------------|--------------|------------------|---------|
| 1 | EEE1111 | Electrical Circuit | 3 | 3.0 |
| 2 | EEE1112 | Electrical Circuit Sessional | 2 | 1.0 |
| 3 | EEE13 11 | Basic Electronics | 3 | 3.0 |
| 4 | EEE 1312 | Basic Electronics Sessional | 2 | 1.0 |
| | | **Total** | **10** | **8.0** |

### 1.4 Elective Courses

| Sl. No. | Course Number | Course Name | Credit |
|---------|---------------|-------------|--------|
| 1 | CSE4231 | Design of VLSI Circuits and Systems | 3 |
| 2 | CSE4232 | Design of VLSI Circuits and Systems Sessional | 1 |

| 3 | CSE4241 | Computational Geometry | 3 |
| 4 | CSE4242 | Computational Geometry Sessional | 1 |
| 5 | CSE4251 | Digital Image Processing | 3 |
| 6 | CSE4252 | Digital Image Processing Sessional | 1 |
| 7 | CSE4331 | Wireless Communication and Networks | 3 |
| 8 | CSE4332 | Wireless Communication and Networks Sessional | 1 |
| 9 | CSE4341 | Multimedia Systems | 3 |
| 10 | CSE4342 | Multimedia Systems Sessional | 1 |
| 11 | CSE4351 | Distributed Database Management Systems | 3 |
| 12 | CSE4352 | Distributed Database Management Systems Sessional | 1 |

## 1.5   List of Prerequisite Courses

| Sl. No. | Course Number | Prerequisite Course Number |
|---|---|---|
| 1 | CSE1311 | CSE1211 |
| 2 | CSE2111 | EEE1111, EEE1311 |
| 3 | CSE2121 | EEE1111, EEE1311, CSE2111 |
| 4 | CSE2131 | CSE1211, CSE1311 |
| 5 | CSE2211 | MATH1111 |
| 6 | CSE2221 | CSE1211, CSE1311 |
| 7 | CSE2311 | CSE1211, CSE1311, CSE2131, CSE2221 |
| 8 | CSE3121 | CSE2321 |
| 9 | CSE3131 | CSE1211 |
| 10 | CSE3211 | CSE1211, CSE2131 |
| 11 | CSE3221 | CSE2211, LAW2211,CSE2321, ACCO2311 |
| 12 | CSE3231 | MATH1111, CSE1211, MATH1211, CSE1311, MATH2111,CSE2221 |
| 13 | CSE3311 | MATH1111, MATH1211, MATH2111,STAT1311 |
| 14 | CSE3321 | CSE 2111, CSE2111, CSE3111 |
| 15 | CSE3331 | CSE2131, CSE2311 |
| 16 | CSE4111 | CSE3111, CSE3211 |
| 17 | CSE4121 | STAT1311, MATH2211, CSE3231 |
| 18 | CSE4131 | CSE3321 |
| 19 | CSE4211 | ACCO2311, CSE2321, CSE3121 |
| 20 | CSE 4221 | CSE3211 |
| 21 | CSE4231 | EEE1111, CSE2111, CSE2121, CSE3111 |
| 22 | CSE4241 | MATH1111, STAT1311, MATH2111, CSE3311 |
| 23 | CSE4311 | STAT1311, MATH2111 |
| 24 | CSE4321 | CSE2321 |
| 25 | CSE4331 | CSE3211 |
| 26 | CSE4351 | CSE3121, CSE4111 |

| Chapter 2 | Course Offering |
|---|---|

## 2.1    Semester-wise Course Distribution

Department will offer the courses to its students, in general, as per the following arrangement:

### Year-I

| Code | Course Title | Hrs/week | Credit |
|---|---|---|---|
| ENG1111 | English as Technical Language | 2 | 2 |
| MATH1111 | Algebra, Trigonometry and Vector Analysis | 3 | 3 |
| CSE1111 | Fundamental of Computer Systems | 3 | 3 |
| EEE1111 | Electrical Circuit | 3 | 3 |
| EEE1112 | Electrical Circuit Sessional | 2 | 1 |
| | Total | 13 | 12 |

### Year-I

| Code | Course Title | Hrs/week | Credit |
|---|---|---|---|
| HUM **11 | General  Education | 2 | 2 |
| MATH1211 | Differential and Integral Calculus | 3 | 3 |
| CHEM1211 | Physical  and Inorganic Chemistry | 3 | 3 |
| CSE1211 | Programming Technology with C | 3 | 3 |
| CSE1212 | Programming Technology with C  Sessional | 3 | 1.5 |
| | Total | 13 | 12.5 |

### Year-I

| Code | Course Title | Hrs/week | Credit |
|---|---|---|---|
| STAT1311 | Statistics for Engineers | 2 | 2 |
| PHY1311 | Electricity and Magnetism | 3 | 3 |
| PHY1312 | Electricity and Magnetism  Sessional | 1 | 1 |
| EEE1311 | Basic Electronics Circuit | 3 | 3 |
| EEE 1312 | Basic Electronics Circuit Sessional | 2 | 1 |
| CSE1311 | Object Oriented Programming with C++ | 3 | 3 |
| CSE1312 | Object Oriented Programming with C++ Sessional | 3 | 1.5 |
| | Total | 17 | 14.5 |

## Year-II

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| MATH2111 | Matrices and Linear Algebra | 3 | 3 |
| CSE2111 | Introduction to Digital Electronics | 3 | 3 |
| CSE2112 | Introduction to Digital Electronics  Sessional | 2 | 1 |
| CSE2121 | Digital Systems | 3 | 3 |
| CSE2122 | Digital Systems Sessional | 3 | 3 |
| CSE2131 | Data Structure | 2 | 1 |
| CSE2132 | Data Structure  Sessional | 2 | 1 |
| | **Total** | **18** | **15** |

## Year-II

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| HUM **11 | General Education | 2 | 2 |
| MATH2211 | Numerical Analysis | 2 | 2 |
| MATH 2212 | Numerical Analysis Sessional | 2 | 1 |
| CSE2211 | Discrete Mathematics | 3 | 3 |
| CSE2221 | Object Oriented Technology with Java | 3 | 3 |
| CSE2222 | Object Oriented Technology with Java Sessional | 2 | 1 |
| | **Total** | **12** | **12** |

## Year-II

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| HUM **11 | General Education | 2 | 2 |
| CSE2311 | Analysis of Algorithms | 3 | 3 |
| CSE2312 | Analysis of Algorithms Sessional | 2 | 1 |
| CSE2321 | System Analysis and Design | 3 | 3 |
| CSE2322 | Software Development Sessional | 2 | 1 |
| | **Total** | **12** | **10** |

**Year-III**

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| CSE3111 | Computer Architecture and Organization | 3 | 3 |
| CSE3112 | Computer Architecture and Organization Sessional | 2 | 1 |
| CSE3121 | Database Management Systems | 3 | 3 |
| CSE3122 | Database Management Systems Sessional | 2 | 1 |
| CSE3131 | Compiler Design | 3 | 3 |
| CSE3132 | Compiler Design Sessional | 2 | 1 |
| | **Total** | **15** | **12** |

**Year-III**

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| CSE3211 | Computer Networks | 3 | 3 |
| CSE3212 | Computer Networks Sessional | 2 | 1 |
| CSE3221 | Software Engineering | 3 | 3 |
| CSE3222 | Software Engineering Sessional | 2 | 1 |
| CSE3231 | Computer Graphics | 3 | 3 |
| CSE3232 | Computer Graphics Sessional | 2 | 1 |
| HUM **11 | General  Education | 2 | 2 |
| | **Total** | **17** | **14** |

**Year-III**

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| CSE3311 | Digital Signal Processing | 3 | 3 |
| CSE3312 | Digital Signal Processing Sessional | 2 | 1 |
| CSE3321 | Microprocessor and Assembly Language | 3 | 3 |
| CSE3322 | Microprocessor and Assembly Language Sessional | 2 | 1 |
| CSE3331 | Operating Systems | 3 | 3 |
| CSE3332 | Operating Systems Sessional | 2 | 1 |
| HUM **11 | General  Education | 2 | 2 |
| | **Total** | **17** | **14** |

**Year-IV**

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| CSE4111 | Parallel and Distributed Computing | 3 | 3 |
| CSE4112 | Parallel and Distributed Computing Sessional | 2 | 1 |
| CSE4121 | Computer Simulation and Modeling | 3 | 3 |
| CSE4122 | Computer Simulation and Modeling Sessional | 2 | 1 |
| CSE4131 | Computer Peripherals and Interfacing | 3 | 3 |
| CSE4132 | Computer Peripherals and Interfacing Sessional | 2 | 1 |
| CSE4292 | Thesis or Project (Part I) | 2 | 1 |
| | **Total** | **17** | **13** |

**Year-IV**

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| CSE4211 | E-Commerce | 3 | 3 |
| CSE4212 | E-Commerce Sessional | 2 | 1 |
| CSE 4221 | Internet & Web Technology | 3 | 3 |
| CSE 4222 | Internet & Web Technology Sessional | 2 | 1 |
| CSE42** | Elective I | 3 | 3 |
| CSE42** | Elective I Sessional | 2 | 1 |
| CSE4292 | Thesis or Project (Part I I ) | 2 | 2 |
| | **Total** | **17** | **14** |

**Elective Courses: I**

| |
|---|
| **One Course will be selected from the following** <br> **CSE4221-4222, CSE4231–4232, CSE4241-4242** |

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| CSE4231 | Design of VLSI Circuits and Systems | 3 | 3 |
| CSE4232 | Design of VLSI Circuits and Systems Sessional | 2 | 1 |
| CSE4241 | Computational Geometry | 3 | 3 |
| CSE4242 | Computational Geometry Sessional | 2 | 1 |
| CSE4251 | Digital Image Processing | 3 | 3 |
| CSE4252 | Digital Image Processing Sessional | 2 | 1 |

## Year-IV, 3<sup>rd</sup> Semester

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| CSE4311 | Artificial Intelligence | 3 | 3 |
| CSE4312 | Artificial Intelligence Sessional | 2 | 1 |
| CSE4321 | Management Information Systems | 2 | 2 |
| CSE43** | Elective II | 3 | 3 |
| CSE43** | Elective II Sessional | 2 | 1 |
| CSE4292 | Thesis or Project (Part I I I ) | 3 | 3 |
| | **Total** | **15** | **13** |

## Elective Courses: II

| **One Course will be selected from the following** <br> **CSE4331-4332, CSE4341–4342, CSE4351-4352** |
|---|

| Code | Course Title | Hrs/week | Credit |
|------|-------------|----------|--------|
| CSE4331 | Wireless Communication and Networks | 3 | 3 |
| CSE4332 | Wireless Communication and Networks Sessional | 2 | 1 |
| CSE4341 | Multimedia Systems | 3 | 3 |
| CSE4342 | Multimedia Systems Sessional | 2 | 1 |
| CSE4351 | Distributed Database Management Systems | 3 | 3 |
| CSE4352 | Distributed Database Management Systems Sessional | 2 | 1 |