**Leading University, Sylhet**

Department of Computer Science and Engineering

**(Proposed) Curriculum for Bachelor of Science in Computer Science &Engineering (CSE) for BTEB approved diploma holders**

**Summary of Courses**

(To be effective from Fall semester, 2018)

|  |  |  |  |
| --- | --- | --- | --- |
| **Types of Courses** | **No. Of Courses** | **No. of waived courses** | **Credit Hours** |
| English Courses | 02 | 00 | 06 |
| GED courses | 05 | 02 | 09 |
| Basic Science Courses | 02 | 00 | 07 |
| Mathematics Courses | 05 | 00 | 15 |
| Inter-disciplinary Engineering Courses | 06 | 02 | 15 |
| Program core courses | 21 | 01 | 73 |
| Optional Courses | 03 | 00 | 09 |
| Project / Thesis | 02 | 00 | 06 |
| **Total** | **46** | **05** | **140** |

**List of Courses**

|  |
| --- |
| **Interdisciplinary Courses**  |
| **Course Code** | **Course Title** | **Credit Hours** | **Contact Hours / Week** | **Prerequisite Courses** |
| **English Courses (Two courses- 6 credit hours)** |
| ENG-1111 | English Reading and Speaking | 3 | 3 | N/A |
| ENG-1311 | English Writing and Listening | 3 | 3 | ENG-1111 |
| **Total** | **6** | **6** |  |
| **Basic Science Courses (Two courses- 7 credit hours)** |
| PHY-2211 | General Physics | 3 | 3 | N/A |
| PHY-2212 | General Physics Sessional | 1 | 2 | N/A |
| CHE-2311 | Chemistry | 2 | 2 | N/A |
| CHE-2312 | Chemistry: Sessional | 1 | 2 | N/A |
| **Total** | **07** | **09** |  |
| **Mathematics Courses (5 courses-15 credit hours)** |
| MAT-1111 | Differential and Integral Calculus | 3 | 3 | N/A |
| MAT-1213 | Linear Algebra & Complex Analysis | 3 | 3 | N/A |
| MAT-1315 | Differential Equations and Fourier Analysis | 3 | 3 | MAT-1111 |
| MAT-2111 | Co-Ordinate Geometry and Vector Analysis | 3 | 3 | N/A |
| MAT-2213 | Probability and Statistics | 3 | 3 | N/A |
| **Total** | **15** | **15** |  |
| **General Education Courses (Any three courses-09 credit hours)** |
| **Course Code** | **Course Title** | **Credit Hours** | **Contact Hours / Week** | **Prerequisite Courses** |
| ART-1111 | Bangladesh Studies | 3 | 3 | N/A |
| ART-1215 | Public Administration | 3 | 3 | N/A |
| ART-1217 | Political Science | 3 | 3 | N/A |
| ART-1311 | Introduction to Sociology | 3 | 3 | N/A |
| ECO-2211 | Principals of Economics | 3 | 3 | N/A |
| ART- 2213 | Professional Ethics | 3 | 3 | N/A |
| ACC-2111 | Principles of Accounting | 3 | 3 | N/A |
| MGT-2315 | Introduction to Business | 3 | 3 | N/A |
| MGT-3111 | Industrial Management | 3 | 3 | N/A |
| **Other Engineering Discipline Courses (15 credit hours)** |
| **Course Code** | **Course Title** | **Credit Hours** | **Contact Hours / Week** | **Prerequisite Courses** |
| EEE-1111 | Electrical Circuits I | 3 | 3 | N/A |
| EEE-1112 | Electrical Circuits I Sessional | 1 | 2 | N/A |
| EEE-1215 | Electronics | 3 | 3 | EEE-1111 |
| EEE-1216 | Electronics Sessional | 1 | 2 |  |
| EEE-3211 | Microprocessor, Assembly Language and Computer Interfacing | 3 | 3 |  |
| EEE-3212 | Microprocessor, Assembly Language and Computer Interfacing Sessional | 1 | 2 |  |
| EEE-4127 | VLSI I | 2 | 2 |  |
| EEE-4128 | VLSI I Sessional | 1 | 2 |  |
| **Total** | **15** | **19** |  |

List of Core Courses

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit Hours** | **Contact Hours / Week** | **Prerequisite Courses** |
| CSE-1213 | Computer Programming | 3 | 3 | N/A |
| CSE-1214 | Computer Programming Sessional | 1 | 2 | N/A |
| CSE-1215 | Discrete Mathematics | 3 | 3 | N/A |
| CSE-1315 | Data Structures | 3 | 3 | CSE-1213 |
| CSE-1316 | Data Structures Sessional | 1 | 2 | CSE-1214 |
| CSE-2117 | Computer Algorithms and Complexity | 3 | 3 | CSE-1315 |
| CSE-2118 | Computer Algorithms and Complexity Sessional | 1 | 2 | CSE-1316 |
| CSE-2213 | Object Oriented Programming | 3 | 3 | CSE-1213 |
| CSE-2214 | Object Oriented Programming Sessional | 1 | 2 | CSE-1214 |
| CSE-2319 | Database Management System | 3 | 3 | N/A |
| CSE-2320 | Database Management System Sessional | 1 | 2 | N/A |
| CSE-2321 | Data Communication | 3 | 3 | N/A |
| CSE-3111 | Numerical Methods | 3 | 3 | N/A |
| CSE-3112 | Numerical Methods Sessional | 1 | 2 | N/A |
| CSE-3115 | Computer Networks | 3 | 3 | N/A |
| CSE-3116 | Computer Networks Sessional | 1 | 2 | N/A |
| CSE-3117 | Computer Architecture and Design | 3 | 3 | N/A |
| CSE-3211 | Operating System | 2 | 2 | N/A |
| CSE-3212 | Operating System Sessional | 1 | 2 | N/A |
| CSE-3213 | Digital Signal Processing | 3 | 3 | N/A |
| CSE-3214 | Digital Signal Processing Sessional | 1 | 2 | N/A |
| CSE-3227 | Theory of Computation | 3 | 3 | N/A |
| CSE-3300 | Project-I | 2 | 4 | N/A |
| CSE-3315 | Compiler Design and Construction | 3 | 3 | CSE-3227 |
| CSE-3316 | Compiler Design and Construction Sessional | 1 | 2 | N/A |
| CSE-3317 | Java Programming | 3 | 3 | CSE-2213 |
| CSE-3318 | Java Programming Sessional | 1 | 2 | CSE-2214 |
| CSE-3319 | Software Engineering and Information System Design | 3 | 3 | N/A |
| CSE-3320 | Software Engineering and Information System Design Sessional | 1 | 2 | N/A |
| CSE-4111 | Management Information System | 3 | 3 | N/A |
| CSE-4113 | Computer Graphics | 3 | 3 | CSE-1213 |
| CSE-4114 | Computer Graphics Sessional | 1 | 2 | CSE-1214 |
| CSE-4119 | Artificial Intelligence | 3 | 3 | N/A |
| CSE-4211 | Web Technologies | 3 | 3 | CSE-2319 |
| CSE-4212 | Web Technologies Sessional | 1 | 2 | CSE-2320 |
| CSE-4801 | Project/Thesis | 4 | 8 |  |
| **Total** | **79** | **97** |  |

**List of Specialized Elective Courses**

(Any three courses and sessional (if any), to be taken)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit Hours** | **Contact Hours / Week** | **Prerequisite Courses** |
| CSE-4213 | Optical Fiber Communication | 3 | 3 | CSE-3213 |
| CSE-4215 | Distributed Systems | 2 | 2 |  |
| CSE-4216 | Distributed Systems: Sessional | 1 | 2 |  |
| CSE-4217 | Open Source Tools & Techniques | 2 | 2 |  |
| CSE-4218 | Open Source Tools & Techniques: Sessional | 1 | 2 |  |
| CSE-4219 | Object Oriented Software Development Using UML | 2 | 2 |  |
| CSE-4220 | Object Oriented Software Development Using UML: Sessional | 1 | 2 |  |
| CSE-4221 | Simulation & Modeling  | 2 | 2 |  |
| CSE-4222 | Simulation & Modeling: Sessional | 1 | 2 |  |
| CSE-4223 | Neural Network & Fuzzy Logic | 3 | 3 |  |
| CSE-4225 | Advanced Algorithms | 3 | 3 |  |
| CSE-4227 | Graph Theory & Applications | 2 | 2 |  |
| CSE-4228 | Graph Theory & Applications: Sessional | 1 | 2 |  |
| CSE-4229 | Computer Aided Design & Manufacturing | 2 | 2 |  |
| CSE-4230 | Computer Aided Design & Manufacturing | 1 | 2 |  |
| CSE-4231 | Data Warehousing & Data Mining | 3 | 3 |  |
| CSE-4233 | Machine Learning | 2 | 2 |  |
| CSE-4234 | Machine Learning Sessional | 1 | 2 |  |
| CSE-4311 | Cellular Mobile & Satellite Communication  | 3 | 3 |  |
| CSE-4313 | Image Processing and Computer Vision | 2 | 2 |  |
| CSE-4314 | Image Processing and Computer Vision Sessional | 1 | 2 |  |
| CSE-4315 | Computer Security & Cryptography | 3 | 3 |  |
| CSE-4317 | Human Computer Interaction | 3 | 3 |  |
| CSE-4319 | Advanced Operating Systems | 2 | 2 |  |
| CSE-4320 | Advanced Operating Systems: Sessional | 1 | 2 |  |
| CSE-4321 | Decision Support Systems  | 2 | 2 |  |
| CSE-4322 | Decision Support Systems: Sessional  | 1 | 2 |  |
| CSE-4323 | Introduction to Robotics | 2 | 2 |  |
| CSE-4324 | Introduction to Robotics: Sessional | 1 | 2 |  |
| CSE-4325 | Multimedia Communications  | 3 | 3 |  |

Prepared by

Academic Committee

Department of Computer Science and Engineering

Leading University

Semester-wise Course Distribution

First Semester (1stYear 1st Semester)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Credit Hours**  | **Contact Hour/ Week** | **Prerequisite Courses** |
| ENG-1111 | English Reading and Speaking | 3 | 3 | N/A |
| MAT-1111 | Differential and Integral Calculus | 3 | 3 | N/A |
| EEE-1111 | Electrical Circuits I | 3 | 3 | N/A |
| EEE-1112 | Electrical Circuits I Sessional | 1 | 2 | N/A |
| CSE-1213 | Computer Programming | 3 | 3 | N/A |
| CSE-1214 | Computer Programming: Laboratory | 1 | 2 | N/A |
| **Total** | 14 | 16 |  |

Second Semester (1stYear 2nd Semester)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Credit Hours**  | **Contact Hour/ Week** | **Prerequisite Courses** |
| MAT-1213 | Linear Algebra and Complex Analysis | 3 | 3 | N/A |
| CSE-1215 | Discrete Mathematics | 3 | 3 | N/A |
| EEE-1215 | Electronics | 3 | 3 | N/A |
| EEE-1216 | Electronics Sessional | 1 | 2 | N/A |
| ENG-1311 | English Writing & Listening | 3 | 3 | N/A |
| GED | GED -I | 3 | 3 |  |
| **Total** | 16 | 17 |  |

**Third Semester** (1stYear 3rd Semester)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Credit Hours**  | **Contact Hour/ Week** | **Prerequisite Courses** |
| MAT-1315 | Differential Equations and Fourier Analysis | 3 | 3 | MAT-1111 |
| CSE-1315 | Data Structures  | 3 | 3 | CSE-1213 |
| CSE-1316 | Data Structures: Sessional | 1 | 2 | CSE-1214 |
| PHY-2211 | General Physics | 3 | 3 | N/A |
| PHY-2212 | General Physics Laboratory | 1 | 2 | N/A |
| CSE-2213 | Object Oriented Programming | 3 | 3 | CSE-1213 |
| CSE-2214 | Object Oriented Programming: Sessional | 1 | 2 | CSE-1214 |
| **Total** | 15 | 18 |  |

**Fourth Semester** (2ndYear 1st Semester)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Credit Hours**  | **Contact Hour/ Week** | **Prerequisite Courses** |
| MAT-2111 | Co-Ordinate Geometry and Vector Analysis  | 3 | 3 | N/A |
| CSE-2117 | Computer Algorithms & Complexity | 3 | 3 | CSE-1315 |
| CSE-2118 | Computer Algorithms & Complexity Sessional | 1 | 2 | CSE-1316 |
| CHE-2311 | Chemistry | 2 | 2 | N/A |
| CHE-2312 | Chemistry Sessional | 1 | 2 | N/A |
| CSE-3111 | Numerical Methods | 3 | 3 | N/A |
| CSE-3112 | Numerical Methods: Sessional | 1 | 2 | N/A |
| GED | GED - II | 3 | 3 |  |
| **Total** | 17 | 20 |  |

**Fifth Semester** (2ndYear 2nd Semester)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Credit Hours**  | **Contact Hour/ Week** | **Prerequisite Courses** |
| MAT-2213 | Probability and Statistics | 3 | 3 | N/A |
| CSE-2319 | Database Management System  | 3 | 3 | N/A |
| CSE-2320 | Database Management System: Sessional  | 1 | 2 | N/A |
| CSE-2321 | Data Communication | 3 | 3 |  |
| EEE-3211 | Microprocessor, Assembly Language & Computer Interfacing | 3 | 3 | N/A |
| EEE-3212 | Microprocessor, Assembly Language & Computer Interfacing Laboratory | 1 | 2 | N/A |
| GED | GED - III | 3 | 3 | N/A |
| **Total** | 17 | 20 |  |

**Sixth Semester** (2ndYear 3rd Semester)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Credit Hours**  | **Contact Hour/ Week** | **Prerequisite Courses** |
| CSE-3115 | Computer Networks | 3 | 3 | N/A |
| CSE-3116 | Computer Networks Laboratory  | 1 | 2 | N/A |
| CSE-3117 | Computer Architecture & Design | 3 | 3 | N/A |
| CSE-3211 | Operating System | 2 | 2 | N/A |
| CSE-3212 | Operating System: Sessional | 1 | 2 | N/A |
| CSE-3317 | Java Programming | 3 | 3 | CSE-2213 |
| CSE-3318 | Java Programming: Sessional | 1 | 2 | CSE-2214 |
| **Total** | 14 | 16 |  |

**Seventh Semester** (3rdYear 1st Semester)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Credit Hours**  | **Contact Hour/ Week** | **Prerequisite Courses** |
| CSE-3227 | Theory of Computation | 3 | 3 | N/A |
| CSE-3319 | Software Engineering and Information System Design | 3 | 3 | N/A |
| CSE-3320 | Software Engineering and Information System Design Sessional | 1 | 2 | N/A |
| CSE-4113 | Computer Graphics | 3 | 3 | CSE-1213 |
| CSE-4114 | Computer Graphics Sessional | 1 | 2 | CSE-1214 |
| CSE-3300 | Project – I | 2 | 4 | N/A |
| EEE-4127 | VLSI I | 2 | 2 |  |
| EEE-4128 | VLSI I Sessional | 1 | 2 |  |
| **Total** | 16 | 18 |  |

**Eighth Semester** (3rdYear 2nd Semester)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Credit Hours**  | **Contact Hour/ Week** | **Prerequisite Courses** |
| CSE-3315 | Compiler Design & Construction | 3 | 3 | CSE-3227 |
| CSE-3316 | Compiler Design & Construction: Sessional | 1 | 2 | N/A |
| CSE-4111 | Management Information System | 3 | 3 | N/A |
| CSE-4119 | Artificial Intelligence | 3 | 3 | N/A |
| CSE-4211 | Web Technologies | 3 | 3 | CSE-3219 |
| CSE-4212 | Web Technologies Sessional | 1 | 2 | CSE-3220 |
| **Total** | 14 | 16 |  |

**Ninth Semester** (3rdYear 3rd Semester)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Credit Hours**  | **Contact Hour/ Week** | **Prerequisite Courses** |
| Elective | Elective I | 3 | 3 |  |
| Elective | Elective II | 3 | 3 |  |
| EEE-4801 | Project / Thesis  | 4 | 8 |  |
| **Total** | 10 | 14 |  |

**Tenth Semester** (4th Year 1st Semester)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course No.** | **Course Title** | **Credit Hours**  | **Contact Hour/ Week** | **Prerequisite Courses** |
| CSE-3213 | Digital Signal Processing | 3 | 3 |  |
| CSE-3214 | Digital Signal Processing Sessional | 1 | 2 |  |
| Elective | Elective III | 3 | 3 |  |
| **Total** | 7 | 8 |  |