**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**TEZPUR UNIVERSITY**

**Offered Courses (Autumn 2024)**

 24th July 2024

The following are the courses being offered by the Department of Computer Science & Engineering, in the Autumn Semester, 2024 for Ph.D., M. Tech (IT), M. Tech (CSE), M. Tech (Data Sciences) MCA and B. Tech. programmes. In addition, the students shall have to take Open Elective courses and SWAYAM MOOCs courses as applicable. **Number of MOOCs course taken by each student should not exceed two**.

|  |
| --- |
| **MCA 1st Semester** |
| **Course Code** | **Course Title** | **Credit Structure** | **Credit** | **Course****Type** | **Course Instructor** |
| **L** | **T** | **P** |
| CS411 | Selected Topics in Computing | 3 | 0 | 0 | 3 | Audit | BB |
| CS405 | Discrete Mathematics  | 2 | 1 | 0 | 3 | Core | SP |
| CS409 | Computer Organization and Architecture | 3 | 1 | 1 | 5 | Core | SK |
| CS412 | Data Structures | 3 | 1 | 0 | 4 | Core | AK |
| CS416 | OO Programming and Data Structures Lab | 0 | 1 | 2 | 3 | Core | LBS |
|  | Elective-I | 3 | 0 | 0 | 3 | E |  |
|  | Elective-II | 3 | 0 | 0 | 3 | E |  |
|  |  | Total | 21 |  |  |
| **Choose the Electives from the following groups (Only one elective from one group)** |
| **Group-1** |
| CS421 | Graph Theory | 3 | 0 | 0 | 3 | E | Upasana Sharma |
| **Group-2** |
| CS522 | Computer Graphics | 3 | 0 | 1 | 4 | E | RS |
| CS424 | Formal Language and Automata | 3 | 0 | 0 | 3 | E | JT |
| **MCA 3rd Semester (Two-Year)** |
| EF103 | Communicative English | 2 | 0 | 1 | 3 | Non-credit) | English dept. |
| CS513 | Software Engineering | 3 | 0 | 0 | 3 | Core | TP |
| CS518 | Software Engineering Lab | 0 | 0 | 1 | 1 | Core | TP |
| CS519 | Computer Networks | 3 | 1 | 0 | 4 | Core | NM |
| CS520 | Computer Networks Lab | 0 | 0 | 1 | 1 | Core | NM |
| CS510 | Minor Project |  |  |  | 5 | Core |  |
|  | Elective-5 |  |  |  | 3/4 | E |  |
|  | Open Elective-2 |  |  |  | 3 | OE |  |
|  |  | Total | 20 |  |  |
| **Choose Electives from the following Elective Groups (Only one elective from one group) or MOOCs list.****Open Electives can be taken from MOOC’s Open Elective List.** |
| **Group-I** |
| CS522 | Computer Graphics  | 3 | 0 | 1 | 4 | E | RS |
| CO504 | Natural Language Processing | 3 | 0 | 0 | 3 | E | US |
| CO519 | Internet of Things | 3 | 0 | 1 | 4 | E | DB |
| **Group-II** |
| CO513 | Fundamentals of Speech Processing | 3 | 0 | 1 | 4 | E | SN |
| CS525 | Artificial Intelligence  | 3 | 0 | 0 | 3 |  E | SK |
| CS602 | Image Processing | 3 | 0 | 0 | 3 | E | BB |
| **MCA 3rd Semester** |
| CS513 | Software Engineering | 3 | 0 | 0 | 3 | Core | TP |
| CS518 | Software Engineering Lab | 0 | 0 | 1 | 1 | Core | TP |
| CS519 | Computer Networks | 3 | 1 | 0 | 4 | Core | NM |
| CS520 | Computer Networks Lab | 0 | 0 | 1 | 1 | Core | NM |
| CS510 | Minor Project | 0 | 0 | 5 | 5 | Core |  |
| - | Elective-6 |  |  |  | 3/4 | E |  |
| - | Elective-7 |  |  |  | 3/4 | E |  |
| - | Open Elective-2 |  |  |  | 3 | OE |  |
|  |  | Total | 23 |  |  |
| **Choose Electives from the following Elective Groups (Only one elective from one group) or MOOCs list.****Open Electives can be taken from MOOC’s Open Elective List.** |
| **Group-I** |
| CS522 | Computer Graphics  | 3 | 0 | 1 | 4 | E | RS |
| CO504 | Natural Language Processing | 3 | 0 | 0 | 3 | E | US |
| CO519 | Internet of Things | 3 | 0 | 1 | 4 | E | DB |
| **Group-II** |
| CO513 | Fundamentals of Speech Processing | 3 | 0 | 1 | 4 | E | SN |
| CS525 | Artificial Intelligence  | 3 | 0 | 0 | 3 |  E | SK |
| CS602 | Image Processing | 3 | 0 | 0 | 3 | E | BB |
| **M. Tech. (Data Sciences) 1st Semester** |
| CS539 | Program Core IMathematical Foundations of Data Science  | 4 | 0 | 0 | 4 | Core | SP |
| CS542 | Program Core IIAdvanced Algorithms & Data Structures | 3 | 1 | 0 | 4 | Core | AK |
| CS540 | Research Methodology  | 2 | 0 | 0 | 2 | Core | DKB |
| CS618 | IPR | 2 | 0 | 0 | 2 | Core | IPR Cell |
| CS500 | Laboratory 1 (Data Structures and Algorithms Lab) | 0 | 0 | 2 | 2 | Core | SIS |
|  | Program Elective I |  |  |  | 4 | E |  |
|  | Program Elective II |  |  |  | 4 | E |  |
|  |  | Total | 22 |  |  |
| **Program Elective I -Choose Elective from the following list.** |
| CS620 | Data Science | 3 | 0 | 1 | 4 | E | RS & DKB |
| **Program Elective II -Choose Elective from the following list.** |
| CS614 | Recommender System | 3 | 0 | 1 | 4 | E | TP |
| **M. Tech. (IT) 3rd Semester** |
| IT604 | Term Project I | 0 | 0 | 8 | 8 |  Core |  |
| XXxxx | Elective 5 |  |  |  | 3/4 | E |  |
| XXxxx | Elective 6 |  |  |  | 3/4 | E |  |
|  |  | Total | 14 |  |  |
| **Choose Electives from the following Elective Groups (Only one elective from one group) or MOOCs list.** |
| **Group-I** |
| CO504 | Natural Language Processing  | 3 | 0 | 0 | 3 | E | US |
| CO519 | Internet of Things | 3 | 0 | 1 | 4 | E | DB |
| CS621 | Mobile Computing | 4 | 0 | 0 | 4 | E | NS |
| **Group-II** |
| CO513 | Fundamentals of Speech Processing | 3 | 0 | 1 | 4 | E | SN |
| CS610 | Bioinformatics | 3 | 0 | 0 | 3 | E | SSS |
| CS638 | Software Defined Networking & Network Function Virtualization | 3 | 0 | 0 | 3 | E | NM |
| **M. Tech. (CSE) 1st Semester** |
| CS541 | Mathematical Foundation for Computer Science | 3 | 1 | 0 | 4 | Core | SP |
| CS542 | Advanced Algorithms andData Structures | 2 | 1 | 0 | 3 | Core | AK |
| CS543 | Advanced Programming Lab I | 0 | 1 | 2 | 3 | Core | SIS |
| IT510 | Advanced Operating Systems | 3 | 0 | 1 | 4 | Core | SKD |
| CS634 | Selected Topics in Computer Networks | 3 | 0 | 1 | 4 | Core | Ringki Das |
|  |  | Total | 18 |  |  |
| **M.Tech. (CSE) 3rd Semester** |
| CS640 | Term Project I | 0 | 0 | 8 | 8 | Core |  |
| XXxxx | Elective III |  |  |  | 3/4 | E |  |
| XXxxx | Elective IV |  |  |  | 3/4 | E |  |
| XXxxx | Open Elective II |  |  |  | 3 | OE |  |
|  |  | Total | 17-19 |  |  |
| **Choose Electives from the following elective Groups (Only one elective from one group) or MOOCs list.** |
| **Group-I** |
| CO504 | Natural Language Processing  | 3 | 0 | 0 | 3 | E | US |
| CO519 | Internet of Things | 3 | 0 | 1 | 4 | E | DB |
| CS621 | Mobile Computing | 4 | 0 | 0 | 4 | E | NS |
| **Group-II** |
| CO513 | Fundamentals of Speech Processing | 3 | 0 | 1 | 4 | E | SN |
| CS610 | Bioinformatics |  3 | 0 | 0 | 3 | E | SSS |
| CS638 | Software Defined Networking & Network Function Virtualization | 3 | 0 | 0 | 3 | E | NM |
| **B.Tech. 1st Semester** |
| CSBT100 | Programming for Problem Solving | 2 | 0 | 0 | 2 | Core |  |
| CSBT101 | Programming Lab | 0 | 0 | 2 | 2 | Core |  |
| **B.Tech. 3rd Semester** |
| MS205 | Mathematics - III | 3 | 0 | 0 | 3 | Core | Maths dep. |
| CO202 | Digital Logic Design | 3 | 0 | 1 | 4 | Core | SN |
| CO209 | Computing Workshop | 0 | 0 | 2 | 2 | Core | Upasana Sharma |
| CO210 | Data Structures  | 3 | 1 | 0 | 4 | Core | AK |
| CO211 | Data Structures using Object Oriented Programming Lab | 0 | 1 | 2 | 3 | Core | BN |
| BA201 | Economics | 3 | 0 | 0 | 3 | Core | HSS dept. |
| EC205 | Signals and Systems  | 2 | 1 | 0 | 3 | Core | ECE dept |
| ES201 | Environmental Science | 2 | 0 | 1 | 0 | Audit | ES dept. |
|  |  | Total | 22 |  |  |
| **B.Tech. 5th Semester** |
| CO303 | Computer Graphics  | 3 | 0 | 1 | 4 |  Core | RS |
| CO309 | Operating Systems  | 3 | 0 | 0 | 3 |  Core | JT |
| CO310 | Operating Systems Lab | 0 | 0 | 1 | 1 | Core | JT |
| CO311 | Software Engineering | 3 | 0 | 0 | 3 | Core | BN |
| CO312 | Database Systems  | 3 | 0 | 0 | 3 |  Core | SS |
| CO313 | Database Systems Lab | 0 | 1 | 1 | 2 | Core | Ringki Das |
| LW301 | Indian Constitution  | 1 | 0 | 0 | 0 | Audit | Law Dept. |
| XXxxx | Elective-I (PEC01) |  |  |  | 3 | E |  |
| XXxxx | Open Elective-I (OEC01) |  |  |  | 3 | E |  |
|  |  | Total | 22 |  |  |
| **Choose Elective from the following elective list.** |
| CO318 | Cryptography | 3 | 0 | 0 | 3 | E | NS |
| CO434  | Image Processing | 3 | 0 | 0 | 3 | E | BB |
| **B. Tech. 7th Semester** |
| CO401 | Artificial Intelligence  | 3 | 0 | 0 | 3 |  Core | SK |
| CO402 | Project II | 0 | 0 | 0 | 4 |  Core |  |
| CO404 | Summer Internship /Industrial Training | 0 | 0 | 0 | 0 | Audit |  |
| CT465 | Essence of Traditional Indian Knowledge | 1 | 0 | 0 | 0 | Audit |  |
| CO405 | Comprehensive Written Exam | 0 | 0 | 0 | 0 | Audit |  |
| XXxxx | HSS/Management Elective | 3 | 0 | 0 | 3 | E |  |
| XXxxx | Elective III |  |  |  | 3/4 | E |  |
| XXxxx | Elective IV |  |  |  | 3/4 | E |  |
| XXxxx | Open Elective III |  |  |  | 3 | OE |  |
|  |  | Total | 20 |  |  |
|  | **Choose HSS/Management Elective from the following list** |  |
| BM301 | Social Responsibility and Professional Ethics in Engineering | 3 | 0 | 0 | 3 | E | BA dept. |
| **Choose Electives from the following elective Groups (Only one elective from one group) or MOOCs list.****Open Electives may be taken from MOOC’s Open Elective List.** |
| **Group-I** |
| CO513 | Fundamentals of Speech Processing | 3 | 0 | 1 | 4 | E | SN |
| CO522 | Bioinformatics | 3 | 0 | 0 | 3 | E | SSS |
| CO520 | Software Defined Networking & Network Function Virtualization | 3 | 0 | 0 | 3 | E | NM |
| CO434  | Image Processing | 3 | 0 | 0 | 3 | E | BB |
| **Group-II** |
| CO504 | Natural Language Processing  | 3 | 0 | 0 | 3 | E | US |
| CO519 | Internet of Things | 3 | 0 | 1 | 4 | E | DB |
| CO435 | Mobile Computing | 4 | 0 | 0 | 4 | E | NS |
| IT510 | Advanced Operating Systems | 3 | 0 | 1 | 4 | E | SKD |
| **Ph.D.** |
| CS701 | Algorithms and Complexity | 4 | 0 | 0 | 4 | Core | AK |
| CS704 | Doctoral Research Methodology | 4 | 0 | 0 | 4 | Core | DKB |
| RP799 | Research and Publication Ethics | 1 | 0 | 1 | 2 | Core | Dept Apl. Sc. |
| XXxxx | Research area-based Elective I |  |  |  | 3/4 | E |  |
| XXxxx | Research area based Elective II |  |  |  | 3/4 | E |  |
| XXxxx | Research area based Elective III(Not required if total credit already becomes 16) |  |  |  | 2/3/4 | E |  |
|  |  | Total | 16-18 |  |  |
| **Choose Electives from the following elective Groups (Only one elective from one group) or MOOCs list.** |
| **Group-1** |
| CS610 | Bioinformatics | 3 | 0 | 0 | 3 | E | SSS |
| CS638 | Software Defined Networking & Network Function Virtualization | 3 | 0 | 0 | 3 | E | NM |
| CS602 | Image Processing | 3 | 0 | 0 | 3 | E | BB |
| **Group-2** |
| CS621 | Mobile Computing | 4 | 0 | 0 | 4 | E | NS |
| CS620 | Data Science | 3 | 0 | 1 | 4 | E | RS & DKB |
| CS614 | Recommender System | 3 | 0 | 1 | 4 | E | TP |
| **Open Electives (for Non-CSE, i.e., students from other Departments)** |  |
| CS537  | Natural Language Processing | 3 | 0 | 0 | 3 | OE | US |
| CS536 | Computer Applications and Information Management | 2 | 0 | 1 | 3 | OE | Ringki Das |
| **Core Courses (for 3rd Semester Integrated M.Sc./B.Sc. B.Ed. students)** |  |
| CS535 | Introduction to Scientific Computing | 2 | 0 | 1 | 3 | Core | Guest Faculty-3 not recruited yet |

**List of MOOCs courses offered as electives by the Dept. of CSE in Autumn-2024**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Code** | **Name** | **Duration****(weeks)** | **Credit** | **Degree** |
| CS654 | Programming, data structures and algorithms using Python | 8 | 2 | UG |
| CS658 | Social Networks | 12 | 3 | UG |
| CS660 | Programming in Java | 12 | 3 | UG |
| CS661 | Data Science for Engineers | 8 | 2 | UG/PG |
| CS669 | Introduction to Industry 4.0 and Industrial Internet of Things | 12 | 3 | PG |
| CS670 | Deep Learning/ IIT Ropar | 12 | 3 | UG/PG |
| CS671 | Reinforcement Learning | 12 | 3 | UG/PG |
| CS672 | Ethical Hacking | 12 | 3 | UG/PG |
| CS673 | Demystifying networking | 4 | 1 | UG/PG |
| CS677 | Introduction to Machine Learning | 12 | 3 | UG/PG |
| CS678 | The Joy of Computing Using Python | 12 | 3 | UG/PG |
| EC483 | Cloud Computing  |  | 3 | UG |

**List of MOOCs courses offered as Open electives for the Dept. of CSE in Autumn-2024**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Code** | **Name** | **Duration** | **Credit** | **Degree** |
| EE610 | Solar Energy Engineering and Technology | 12 | 3 | UG/PG |
| FE676 | understanding incubation and entrepreneurship | 12 | 3 | UG |
| ME577 | Operations and Supply chain management | 12 | 3 | UG/PG |
| ME462 | Automation in Manufacturing | 12 | 3 | UG |
| ME453 | Work system design | 12 | 3 | UG |
| ME455 | Genetic Engineering: Theory and Application | 12 | 3 | UG/PG |
| ME456 | Aircraft Propulsion | 12 | 3 | UG/PG |
| EE602 | Electronic Systems for Cancer Diagnosis | 12 | 3 | UG |
| EE611 | Design of photovoltaic systems | 12 | 3 | UG |
| EE685 | Industrial Safety Engineering | 12 | 3 | UG |
| EE688 | Entrepreneurship | 12 | 3 | UG |
| CE461 | Municipal Solid Waste Management | 12 | 3 | UG |
| CE576 | Introduction to Engineering Seismology | 12 | 3 | UG |

**(S. Saharia)**

**Head, CSE**