## R 25 Regulations
## Course Structures
## CSE (Artificial Intelligence & Machine Learning)
## Academic Year: 2025-26

### I-Year, Semester-I

| S.No | Course Code | Course Title | L | T | P | Credits |
|------|-------------|--------------|---|---|---|---------|
| 1 | | Matrices and Calculus | 3 | 1 | 0 | 4 |
| 2 | | Advanced Engineering Physics | 3 | 0 | 0 | 3 |
| 3 | | Engineering Drawing and Computer Aided Drafting | 2 | 0 | 2 | 3 |
| 4 | | Basic Electrical Engineering | 3 | 0 | 0 | 3 |
| 5 | | Programming for Problem Solving | 3 | 0 | 0 | 3 |
| 6 | | Advanced Engineering Physics Lab | 0 | 0 | 2 | 1 |
| 7 | | Programming for Problem Solving Lab | 0 | 0 | 2 | 1 |
| 8 | | IT Workshop | 0 | 0 | 2 | 1 |
| 9 | | Basic Electrical Engineering Lab | 0 | 0 | 2 | 1 |
| 10 | | Induction Program | | | | |
| | | **Total Credits** | **14** | **1** | **10** | **20** |

### I-Year, Semester-II

| S.No | Course Code | Course Title | L | T | P | Credits |
|------|-------------|--------------|---|---|---|---------|
| 1 | | Ordinary Differential Equations and Vector Calculus | 3 | 1 | 0 | 4 |
| 2 | | Engineering Chemistry | 3 | 0 | 0 | 3 |
| 3 | | English for Skill Enhancement | 3 | 0 | 0 | 3 |
| 4 | | Electronic Devices and Circuits | 3 | 0 | 0 | 3 |
| 5 | | Data Structures | 3 | 0 | 0 | 3 |
| 6 | | Engineering Chemistry Lab | 0 | 0 | 2 | 1 |
| 7 | | Data Structures Lab | 0 | 0 | 2 | 1 |
| 8 | | English Language and Communication Skills Lab | 0 | 0 | 2 | 1 |
| 9 | | Engineering Workshop | 0 | 0 | 2 | 1 |
| | | **Total Credits** | **15** | **1** | **8** | **20** |

## II-Year, Semester-I

| S.No | Course Code | Course Title | L | T | P | Credits |
|------|-------------|--------------|---|---|---|---------|
| 1 | | Mathematical and Statistical Foundations | 3 | 0 | 0 | 3 |
| 2 | | Computer Organization and Architecture | 3 | 0 | 0 | 3 |
| 3 | | Python Programming | 3 | 0 | 0 | 3 |
| 4 | | Software Engineering | 3 | 0 | 0 | 3 |
| 5 | | Database Management System | 3 | 0 | 0 | 3 |
| 6 | | Computational Mathematics Lab | 0 | 0 | 2 | 1 |
| 7 | | Python Programming Lab | 0 | 0 | 2 | 1 |
| 8 | | Database Management Systems Lab | 0 | 0 | 2 | 1 |
| 9 | | Data Visualization- Tableau | 0 | 0 | 2 | 1 |
| 10 | | Indian Knowledge System | 0 | 0 | 2 | 1 |
| | | **Total Credits** | **15** | **0** | **10** | **20** |

## II-Year, Semester-II

| S.No | Course Code | Course Title | L | T | P | Credits |
|------|-------------|--------------|---|---|---|---------|
| 1 | | Discrete Mathematics | 3 | 0 | 0 | 3 |
| 2 | | Operating Systems | 3 | 0 | 0 | 3 |
| 3 | | Object Oriented Programming through Java | 3 | 0 | 0 | 3 |
| 4 | | Computer Networks | 3 | 0 | 0 | 3 |
| 5 | | Machine Learning | 3 | 0 | 0 | 3 |
| 6 | | Innovation and Entrepreneurship | 2 | 0 | 0 | 2 |
| 7 | | Operating Systems Lab | 0 | 0 | 2 | 1 |
| 8 | | Computer Networks Lab | 0 | 0 | 2 | 1 |
| 9 | | Object Oriented Programming through Java Lab | 0 | 0 | 2 | 1 |
| 10 | | Machine Learning Lab | 0 | 0 | 2 | 1 |
| 11 | | UI Design – Flutter | 0 | 0 | 2 | 1 |
| | | **Total Credits** | **17** | **0** | **10** | **22** |

**Note:** Students who wish to exit after **II Year II Semester** has to register for this optional course and acquire the credits allotted by doing 6 weeks Work-based Vocational Course/ Internship or Apprenticeship. Please refer **R 25 Academic Regulations** for more information.

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## III-Year, Semester-I

| S.No | Course Code | Course Title | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | | Artificial Intelligence | 3 | 0 | 0 | 3 |
| 2 | | Algorithm Design and Analysis | 3 | 0 | 0 | 3 |
| 3 | | Automata Theory and Compiler Design | 3 | 0 | 0 | 3 |
| 4 | | Professional Elective-I | 3 | 0 | 0 | 3 |
| 5 | | Open Elective-I | 2 | 0 | 0 | 2 |
| 6 | | Artificial Intelligence Lab | 0 | 0 | 2 | 1 |
| 7 | | Algorithm Design and Analysis Lab | 0 | 0 | 2 | 1 |
| 8 | | Professional Elective - 1 Lab | 0 | 0 | 2 | 1 |
| 9 | | Field Based Research Project | 0 | 0 | 4 | 2 |
| 10 | | Node JS/React JS/Django | 0 | 0 | 2 | 1 |
| 11 | | Gender Sensitization Laboratory*/ Human Values and Professional Ethics* | 1 | 0 | 0 | 1 |
| | | **Total Credits** | **15** | **0** | **12** | **21** |

## III-Year, Semester-II

| S.No | Course Code | Course Title | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | | Natural Language Processing | 3 | 0 | 0 | 3 |
| 2 | | Deep Learning | 3 | 0 | 0 | 3 |
| 3 | | Business Economics and Financial Analysis | 3 | 0 | 0 | 3 |
| 4 | | Professional Elective-II | 3 | 0 | 0 | 3 |
| 5 | | Open Elective – II | 2 | 0 | 0 | 2 |
| 6 | | Natural Language Processing Lab | 0 | 0 | 2 | 1 |
| 7 | | Deep Learning Lab | 0 | 0 | 2 | 1 |
| 8 | | Chatbots Lab | 0 | 0 | 2 | 1 |
| 9 | | Advanced English Communication Skills Laboratory | 0 | 0 | 2 | 1 |
| 10 | | Prompt Engineering | 0 | 0 | 2 | 1 |
| 11 | | Environmental Science | 1 | 0 | 0 | 1 |
| | | **Total Credits** | **15** | **0** | **10** | **20** |

**Note:** For the courses Gender Sensitization Lab and Human Values and Professional Ethics - one hour of instruction will be conducted on alternate weeks. For example, if a one-hour class for Gender Sensitization Lab is conducted this week, then a one-hour class for Human Values and Professional Ethics will be conducted in the following week.

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## IV-Year, Semester-I

| S.No | Course Code | Course Title | L | T | P | Credits |
|------|-------------|--------------|---|---|---|---------|
| 1 | | Reinforcement Learning | 3 | 0 | 0 | 3 |
| 2 | | Generative AI | 3 | 0 | 0 | 3 |
| 3 | | Fundamentals of Management for Engineers | 3 | 0 | 0 | 3 |
| 4 | | Professional Elective-III | 3 | 0 | 0 | 3 |
| 5 | | Professional Elective – IV | 3 | 0 | 0 | 3 |
| 6 | | Open Elective – III | 2 | 0 | 0 | 2 |
| 7 | | Reinforcement Learning Lab | 0 | 0 | 2 | 1 |
| 8 | | Generative AI Lab | 0 | 0 | 2 | 1 |
| 9 | | Industry Oriented Mini Project/ Internship | 0 | 0 | 4 | 2 |
| | | **Total Credits** | **17** | **0** | **8** | **21** |

## IV-Year, Semester-II

| S.No | Course Code | Course Title | L | T | P | Credits |
|------|-------------|--------------|---|---|---|---------|
| 1 | | Professional Elective – V | 3 | 0 | 0 | 3 |
| 2 | | Professional Elective – VI | 3 | 0 | 0 | 3 |
| 3 | | Project Work | 0 | 0 | 28 | 14 |
| | | **Total Credits** | **17** | **0** | **8** | **21** |

## Professional Electives

## Professional Elective-I

| Course Code | Course Title |
|-------------|--------------|
| | Data Analytics and Visualization |
| | Cryptography and Network Security |
| | Software Testing Methodologies |
| | Data Mining |
| | Web Technologies |
| | DevOps |

## Professional Elective Lab-I

| Course Code | Course Title |
| --- | --- |
| | Data Analytics and Visualization Lab |
| | Cryptography and Network Security Lab |
| | Software Testing Methodologies Lab |
| | Data Mining Lab |
| | Web Technologies Lab |
| | DevOps Lab |

## Professional Elective-II

| Course Code | Course Title |
| --- | --- |
| | Image Processing |
| | Blockchain Technology |
| | Software Project Management |
| | Mining Massive Datasets |
| | Full Stack Development |
| | Distributed Systems |

## Professional Elective-III

| Course Code | Course Title |
| --- | --- |
| | Computer Vision |
| | Cognitive Computing |
| | Penetration Testing and Incident Response |
| | Data Stream Mining |
| | Cloud Computing |
| | Information Retrieval Systems |

## Professional Elective-IV

| Course Code | Course Title |
| --- | --- |
| | Augmented Reality & Virtual Reality |
| | Agile Methodology |
| | Big Data Technologies |
| | Quantum Computing |
| | Robotic Process Automation |
| | Cyber Forensics |

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## Professional Elective-V

| Course Code | Course Title |
| --- | --- |
|  | Social Media Mining |
|  | Nature Inspired Computing |
|  | Internet of Things |
|  | Game Theory |
|  | Mobile Application Development |
|  | Human Computer Interaction |

## Professional Elective-VI

| Course Code | Course Title |
| --- | --- |
|  | High Performance Computing |
|  | Edge Computing |
|  | Graph Theory |
|  | Explainable AI |
|  | Sustainable Engineering |
|  | Distributed Databases |

## Open Electives

## Open Elective-I

| Course Code | Course Title |
| --- | --- |
|  | Fundamentals of AI |
|  | Machine Learning Basics |

## Open Elective-II

| Course Code | Course Title |
| --- | --- |
|  | Introduction to Natural Language Processing |
|  | AI applications |

## Open Elective-III

| Course Code | Course Title |
| --- | --- |
|  | Chatbots |
|  | Computer Vision with Open CV |