

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**B.Tech. in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**  
**Course Structure & Syllabus (R25 Regulations)**  
**Applicable from AY 2025-26 Batch**

**I Year I Semester**

| S. No. | Course Code | Course Title                        | L         | T        | P         | Credits   |
|--------|-------------|-------------------------------------|-----------|----------|-----------|-----------|
| 1      | BSC         | Matrices and Calculus               | 3         | 1        | 0         | 4         |
| 2      | BSC         | Advanced Engineering Physics        | 3         | 0        | 0         | 3         |
|        | MEC         | Computer Aided Engineering Graphics | 2         | 0        | 2         | 3         |
|        |             | Basic Electrical Engineering        | 3         | 0        | 0         | 3         |
| 3      | CSC         | Programming for Problem Solving     | 3         | 0        | 0         | 3         |
| 6      | BSC         | Advanced Engineering Physics Lab    | 0         | 0        | 2         | 1         |
| 7      | CSC         | Programming for Problem Solving Lab | 0         | 0        | 2         | 1         |
|        |             | IT workshop                         | 0         | 0        | 2         | 1         |
| 8      | HSC         | Basic Electrical Engineering Lab    | 0         | 0        | 2         | 1         |
| 9      |             | Induction Program                   |           |          |           |           |
|        |             | <b>Total Credits</b>                | <b>14</b> | <b>1</b> | <b>10</b> | <b>20</b> |

**I Year II Semester**

| S. No. | Course Code | Course Title  | L         | T        | P         | Credits   |
|--------|-------------|---|-----------|----------|-----------|-----------|
| 1      | BSC         | Ordinary Differential Equations and Vector Calculus | 3         | 0        | 0         | 3         |
| 2      | BSC         | Engineering Chemistry                               | 3         | 0        | 0         | 3         |
| 3      | HSC         | 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      | BSC         | Engineering Chemistry Lab                           | 0         | 0        | 2         | 1         |
| 7      |             | Data Structures Lab                                 | 0         | 0        | 2         | 1         |
| 8      | HSC         | English Language and Communication Skills Lab       | 0         | 0        | 2         | 1         |
| 9      | MEC         | Engineering Workshop                                | 0         | 0        | 2         | 1         |
|        |             | Python Programming Lab                              | 0         | 0        | 2         | 1         |
|        |             | <b>Total Credits</b>                                | <b>15</b> | <b>0</b> | <b>10</b> | <b>20</b> |

**II YEAR I SEMESTER**

| S. No. | Course Code | Course Title   | L         | T        | P         | Credits   |
|--------|-------------|--|-----------|----------|-----------|-----------|
| 1      | BSC         | <b>Mathematical and Statistical Foundations</b>        | 3         | 0        | 0         | 3         |
| 2      |             | Computer Organization and Architecture                 | 3         | 0        | 0         | 3         |
| 3      |             | Object Oriented Programming through java               | 3         | 0        | 0         | 3         |
| 4      |             | Software Engineering                                   | 3         | 0        | 0         | 3         |
| 5      |             | Data Base Management Systems                           | 3         | 0        | 0         | 3         |
|        | BSC         | <b>Computational Mathematics Lab</b>                   | 0         | 0        | 2         | 1         |
| 6      |             | Object Oriented Programming through java Lab           | 0         | 0        | 2         | 1         |
| 7      |             | Software Engineering Lab                               | 0         | 0        | 2         | 1         |
| 8      |             | Data Base Management Systems Lab                       | 0         | 0        | 2         | 1         |
| 9      | SDC         | Skill Development Course – 1 (Node Js/React JS/Django) | 0         | 0        | 2         | 1         |
|        |             | <b>Total Credits</b>                                   | <b>15</b> | <b>0</b> | <b>10</b> | <b>20</b> |

**II YEAR II SEMESTER**

| 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      |             | Algorithm Design and Analysis   | 3         | 0        | 0        | 3         |
| 4      |             | Computer Networks   | 3         | 0        | 0        | 3         |
| 5      |             | Machine Learning  | 3         | 0        | 0        | 3         |
|        |             | <b>Innovation and Entrepreneurship</b>                                | 2         | 0        | 0        | 2         |
| 6      |             | Operating Systems Lab   | 0         | 0        | 2        | 1         |
| 7      |             | Computer Networks Lab   | 0         | 0        | 2        | 1         |
| 8      |             | Machine Learning Lab  | 0         | 0        | 2        | 1         |
| 9      | SDC         | Skill Development Course – 2 (Data Visualization-R/ Python/ Power BI) | 0         | 0        | 2        | 1         |
| 10     | *MC         | Indian Knowledge System   | 1         | 0        | 0        | 1         |
|        |             | <b>Total Credits</b>  | <b>18</b> | <b>0</b> | <b>8</b> | <b>22</b> |

**\*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 R25 Academic Regulations for more information.

**III YEAR I SEMESTER**

| S. No. | Course Code | Course Title  | L         | T        | P         | Credits   |
|--------|-------------|---|-----------|----------|-----------|-----------|
| 1      |             | Introduction to Data Science  | 3         | 0        | 0         | 3         |
| 2      |             | Big Data Technologies   | 3         | 0        | 0         | 3         |
| 3      |             | Artificial Intelligence   | 3         | 0        | 0         | 3         |
| 4      |             | Professional Elective-I   | 3         | 0        | 0         | 3         |
| 5      |             | Open Elective-I   | 2         | 0        | 0         | 2         |
| 6      |             | Data Science Lab  | 0         | 0        | 2         | 1         |
| 7      |             | Big Data Technologies Lab   | 0         | 0        | 2         | 1         |
| 8      |             | Artificial Intelligence with Python Lab                                 | 0         | 0        | 2         | 1         |
|        |             | Field Based Project/ Internship *                                       | 0         | 0        | 4         | 2         |
| 9      | SDC         | Skill Development Course – 3 (UI Design –Flutter/ Android Studio)       | 0         | 0        | 2         | 1         |
| 10     | MC*         | Gender Sensitization Laboratory*/ Human Values and Professional Ethics* | 1         | 0        | 0         | 1         |
|        |             | <b>Total Credits</b>  | <b>15</b> | <b>0</b> | <b>10</b> | <b>21</b> |

**\*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.

**III YEAR II SEMESTER**

| S. No | Course Code | Course Title                              | L | T | P | Credits |
|-------|-------------|---|---|---|---|---------|
| 1     |             | Data Mining                               | 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     |             | Data mining Lab                           | 0 | 0 | 2 | 1       |

|    |     |   |           |          |           |           |
|----|-----|---|-----------|----------|-----------|-----------|
| 7  |     | Deep Learning Lab   | 0         | 0        | 2         | 1         |
| 8  |     | Web Programming Lab   | 0         | 0        | 2         | 1         |
| 9  | HSC | Advanced English Communication Skills Laboratory                    | 0         | 0        | 2         | 1         |
| 10 | SDC | Skill Development Course – 4 (prompt Engineering with chatbots Lab) | 0         | 0        | 2         | 1         |
| 11 | MC* | Environmental Science   | 1         | 0        | 0         | 1         |
|    |     | <b>Total Credits</b>  | <b>14</b> | <b>0</b> | <b>14</b> | <b>21</b> |

**IV YEAR I SEMESTER**

| S. No. | Course Code | Course Title                                      | L         | T        | P         | Credits   |
|--------|-------------|---|-----------|----------|-----------|-----------|
| 1      |             | Generative AI                                     | 3         | 0        | 0         | 3         |
| 2      |             | Data Engineering                                  | 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      |             | Generative AI Lab                                 | 0         | 0        | 2         | 1         |
| 8      |             | Data Engineering Lab                              | 0         | 0        | 2         | 1         |
| 9      |             | Industry Oriented Mini Project/ Summer Internship | 0         | 0        | 4         | 2         |
|        |             | <b>Total Credits</b>                              | <b>17</b> | <b>0</b> | <b>08</b> | <b>21</b> |

**IV YEAR II SEMESTER**

| 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        |
|        |             | <b>Total Credits</b>       | <b>6</b> | <b>0</b> | <b>28</b> | <b>20</b> |

**PROFESSIONAL ELECTIVES****Professional Elective - I**

|   |                                   |
|---|-----------------------------------|
| 1 | Computer Graphics                 |
| 2 | DevOps                            |
| 3 | Software Testing Methodologies    |
| 4 | Cryptography and Network Security |
| 5 | Web Programming                   |
| 6 | Distributed Systems               |

**Professional Elective - II**

|   |                             |
|---|-----------------------------|
| 1 | Image Processing            |
| 2 | Blockchain Technology       |
| 3 | Software Project Management |
| 4 | Mining Massive Datasets     |
| 5 | Full Stack Development      |
| 6 | Cyber Security              |

**Professional Elective-III**

|   |  |
|---|--|
| 1 | Computer Vision                                  |
| 2 | Vulnerability Assessment and Penetration Testing |
| 3 | Cyber Forensics                                  |
| 4 | Data Stream Mining                               |
| 5 | Cloud Computing                                  |
| 6 | Information Retrieval Systems                    |

**Professional Elective-IV**

|   |                                     |
|---|-------------------------------------|
| 1 | Augmented Reality & Virtual Reality |
| 2 | Agile Methodology                   |
| 3 | Reinforcement Learning              |
| 4 | Quantum Computing                   |
| 5 | Robotic Process Automation          |
| 6 | UI/UX Design                        |

**Professional Elective-V**

|   |                                |
|---|--------------------------------|
| 1 | Social Media Mining            |
| 2 | Nature Inspired Computing      |
| 3 | Internet of Things             |
| 4 | Game Theory                    |
| 5 | Mobile Application Development |
| 6 | Human Computer Interaction     |

**Professional Elective-VI**

|   |                            |
|---|----------------------------|
| 1 | High Performance Computing |
| 2 | Edge Computing             |
| 3 | Graph Theory               |
| 4 | Adhoc & Sensor Networks    |
| 5 | Sustainable Engineering    |
| 6 | Distributed Databases      |

**Open Elective I:**

1. Fundamentals of AI
2. R Programming

**Open Elective II:**

1. Introduction to Natural Language Processing
2. MERN Stack Development

**Open Elective III:**

1. Chatbots
2. Augmented Reality