



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURJADA VIZIANAGARAM**  
**VIZIANAGARAM – 535 003, Andhra Pradesh, India**

**B. Tech (AI & ML)**  
**(R23-COURSE STRUCTURE)**

**(Applicable from the academic year 2023-24 and onwards)**

**B.Tech.–I Year I Semester**

| S.No | Course Code | Course Name                          | L | T | P | Credits     |
|------|-------------|--------------------------------------|---|---|---|-------------|
| 1.   | R23BS01     | Linear Algebra & Calculus            | 3 | 0 | 0 | 3           |
| 2.   | R23BS03     | Engineering Physics                  | 3 | 0 | 0 | 3           |
| 3.   | R23HS01     | Communicative English                | 2 | 0 | 0 | 2           |
| 4.   | R23ES01     | Basic Civil & Mechanical Engineering | 3 | 0 | 0 | 3           |
| 5.   | R23ES07     | Introduction to Programming          | 3 | 0 | 0 | 3           |
| 6.   | R23HS01     | Communicative English Lab            | 0 | 0 | 2 | 1           |
| 7.   | R23BS03     | Engineering Physics Lab              | 0 | 0 | 2 | 1           |
| 8.   | R23ES02     | Engineering Workshop                 | 0 | 0 | 3 | 1.5         |
| 9.   | R23ES06     | IT Workshop                          | 0 | 0 | 2 | 1           |
| 10.  | R23ES07     | Computer Programming Lab             | 0 | 0 | 3 | 1.5         |
| 11.  | R23MC01     | Health and Wellness, Yoga and Sports | 0 | 0 | 1 | 0.5         |
|      |             | <b>Total</b>                         |   |   |   | <b>20.5</b> |

**B.Tech –I Year II Semester**

| S.No | Course Code | Course Name                                   | L | T | P | Credits     |
|------|-------------|---|---|---|---|-------------|
| 1.   | R23BS02     | Differential Equations and Vector calculus    | 3 | 0 | 0 | 3           |
| 2.   | R23BS05     | Chemistry                                     | 3 | 0 | 0 | 3           |
| 3.   | R23ES03     | Engineering Graphics                          | 1 | 0 | 4 | 3           |
| 4.   | R23ES04     | Basic Electrical & Electronics Engineering    | 3 | 0 | 0 | 3           |
| 5.   | R23PC04     | Data Structures                               | 3 | 0 | 0 | 3           |
| 6.   | R23BS05     | Chemistry Lab                                 | 0 | 0 | 2 | 1           |
| 7.   | R23ES05     | Electrical & Electronics Engineering workshop | 0 | 0 | 3 | 1.5         |
| 8.   | R23PC04     | Data Structures Lab                           | 0 | 0 | 3 | 1.5         |
| 9.   | R23MC02     | NSS/NCC/Scouts & Guides/Community Service     | 0 | 0 | 1 | 0.5         |
|      |             | <b>Total</b>                                  |   |   |   | <b>19.5</b> |



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**B.Tech.– II Year I Semester**

| S.No.        | Category                 | Title   | L         | T        | P        | Credits   |
|--------------|--------------------------|---|-----------|----------|----------|-----------|
| 1            | BS                       | Discrete Mathematics & Graph Theory                                     | 3         | 0        | 0        | 3         |
| 2            | HSMC                     | Universal Human Values 2- Understanding Harmony & Ethical Human Conduct | 2         | 1        | 0        | 3         |
| 3            | Engineering Science      | Principles of Artificial Intelligence                                   | 3         | 0        | 0        | 3         |
| 4            | Professional Core        | Advanced Data Structures & Algorithms Analysis                          | 3         | 0        | 0        | 3         |
| 5            | Professional Core        | Object Oriented Programming Through Java                                | 3         | 0        | 0        | 3         |
| 6            | Professional Core        | Advanced Data Structures and Algorithms Lab                             | 0         | 0        | 3        | 1.5       |
| 7            | Professional Core        | Object Oriented Programming Through Java Lab                            | 0         | 0        | 3        | 1.5       |
| 8            | Skill Enhancement course | Python programming  | 0         | 1        | 2        | 2         |
| 9            | Audit Course             | Environmental Science   | 2         | 0        | 0        | -         |
| <b>Total</b> |                          |   | <b>16</b> | <b>2</b> | <b>8</b> | <b>20</b> |

**B.Tech.– II Year II Semester**

| S.No.        | Category                 | Title                                     | L         | T        | P         | Credits   |
|--------------|--------------------------|---|-----------|----------|-----------|-----------|
| 1            | Management Elective - II | Managerial Economics & Financial Analysis | 2         | 0        | 0         | 2         |
| 2            | Basic Science            | Probability & Statistics                  | 3         | 0        | 0         | 3         |
| 3            | Professional Core        | Machine Learning                          | 3         | 0        | 0         | 3         |
| 4            | Professional Core        | Database Management Systems               | 3         | 0        | 0         | 3         |
| 5            | Professional Core        | Digital Logic & Computer Organization     | 3         | 0        | 0         | 3         |
| 6            | Professional Core        | Machine Learning Lab                      | 0         | 0        | 3         | 1.5       |
| 7            | Professional Core        | Database Management Systems Lab           | 0         | 0        | 3         | 1.5       |
| 8            | Skill Enhancement course | Full Stack development -1                 | 0         | 1        | 2         | 2         |
| 9            | ES                       | Design Thinking & Innovation              | 1         | 0        | 2         | 2         |
| <b>Total</b> |                          |   | <b>15</b> | <b>1</b> | <b>12</b> | <b>21</b> |

Mandatory Community Service Project Internship of 08 weeks duration during summer vacation



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**B.Tech. – III Year I Semester**

| S.No.        | Category                                   | Title   | L         | T        | P         | Credits   |
|--------------|--|---|-----------|----------|-----------|-----------|
| 1            | Professional Core                          | Information Retrieval Systems   | 3         | 0        | 0         | 3         |
| 2            | Professional Core                          | Computer Networks   | 3         | 0        | 0         | 3         |
| 3            | Professional Core                          | Deep Learning with Applications   | 3         | 0        | 0         | 3         |
| 4            | Professional Elective-I                    | Software Engineering<br>Digital Twin<br>Mobile Edge Computing<br>Optimization Techniques<br>Any of the 12-Week SWAYAM /NPTEL<br>Course suggested by the BoS | 3         | 0        | 0         | 3         |
| 5            | Open Elective- I                           | <b>Open elective offered by other department</b>  | 3         | 0        | 0         | 3         |
| 6            | Professional Core                          | Information Retrieval & Deep Learning Lab   | 0         | 0        | 3         | 1.5       |
| 7            | Professional Core                          | Computer Networks Lab   | 0         | 0        | 3         | 1.5       |
| 8            | Skill Enhancement course                   | NodesJS   | 0         | 1        | 2         | 2         |
| 9            | ES   | Tinkering Lab   | 0         | 0        | 2         | 1         |
| 10           | Evaluation of Community Service Internship |   | -         | -        | -         | 2         |
| <b>Total</b> |  |   | <b>14</b> | <b>1</b> | <b>10</b> | <b>23</b> |



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**(R23-COURSE STRUCTURE)**

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**B.Tech.– III Year II Semester**

| S.No.  | Category                  | Title   | L         | T        | P        | Credits   |
|--|---------------------------|---|-----------|----------|----------|-----------|
| 1  | Professional Core         | Operating System  | 3         | 0        | 0        | 3         |
| 2  | Professional Core         | Automata Theory & Compiler Design   | 3         | 0        | 0        | 3         |
| 3  | Professional Core         | Computer Vision   | 3         | 0        | 0        | 3         |
| 4  | Professional Elective-II  | 1. Software Testing Methodology<br>2. Cryptography & Network Security<br>3. Internet of Things<br>4. Recommender Systems<br>5. Any of the 12-Week SWAYAM /NPTEL Course suggested by the BoS | 3         | 0        | 0        | 3         |
| 5  | Professional Elective-III | 1. Software Project Management<br>2. Ethical AI<br>3. Data Visualization<br>4. Soft computing<br>5. Any of the 12-Week SWAYAM /NPTEL Course suggested by the BoS                            | 3         | 0        | 0        | 3         |
| 6  | Open Elective - III       | <b>Open elective offered by other department</b>  | 3         | 0        | 0        | 3         |
| 7  | Professional Core         | Computer Vision Lab   | 0         | 0        | 3        | 1.5       |
| 8  | Professional Core         | Operating System lab  | 0         | 0        | 3        | 1.5       |
| 9  | Skill Enhancement course  | Soft skills   | 0         | 1        | 2        | 2         |
| 10   | Audit Course              | <b>Technical Paper Writing &amp; IPR</b>  | 2         | 0        | 0        | -         |
| <b>Total</b>   |                           |   | <b>20</b> | <b>1</b> | <b>8</b> | <b>23</b> |
| Mandatory Industry Internship of 08 weeks duration summer vacation |                           |   |           |          |          |           |



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**B.Tech. – IV Year I Semester**

| S.No.        | Category                 | Title   | L         | T        | P         | Credits   |
|--------------|--------------------------|---|-----------|----------|-----------|-----------|
| 1            | Professional Core        | Natural Language Programming  | 3         | 0        | 0         | 3         |
| 2            | Management Course- II    | Management Science<br>Human resource Management<br>Entrepreneurship &Incubation   | 2         | 0        | 0         | 2         |
| 3            | Professional Elective-IV | 1. Federated Learning<br>2. NoSQL databases<br>3. Quantum Computing<br>4. Computational Neuroscience<br>5. Any of the 12-Week SWAYAM /NPTEL Course suggested by the BoS               | 3         | 0        | 0         | 3         |
| 4            | Professional Elective-V  | 1. Agile methodologies<br>2. Big Data Analytics<br>3. Reinforcement Learning<br>4.High-performance Computing (HPC)<br>5. Any of the 12-Week SWAYAM /NPTEL Course suggested by the BoS | 3         | 0        | 0         | 3         |
| 5            | Open Elective-III        | <b>Open elective offered by other department</b>  | 3         | 0        | 0         | 3         |
| 6            | Open Elective-IV         | <b>Open elective offered by other department</b>  | 3         | 0        | 0         | 3         |
| 7            | Skill Enhancement Course | Prompt Engineering  | 0         | 1        | 2         | 2         |
| 8            | Audit Course             | Gender Sensitization  | 2         | 0        | 0         | -         |
| 9            | Internship               | Evaluation of Industry Internship   | -         | -        | -         | 2         |
| <b>Total</b> |                          |   | <b>19</b> | <b>1</b> | <b>02</b> | <b>21</b> |

**B.Tech.– IV Year II Semester**

| S.No. | Category                  | Title                                   | L | T | P  | Credits |
|-------|---------------------------|---|---|---|----|---------|
| 1     | Internship & Project Work | Full semester Internship & Project Work | 0 | 0 | 24 | 12      |



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**OPEN ELECTIVES OFFERED BY (AI & ML) TO OTHER BRANCHES:**

| <b>OPEN ELECTIVE -I</b>   | <b>OPEN ELECTIVE -II</b>   |
|---|--|
| <ol style="list-style-type: none"><li>1. Introduction to Artificial Intelligence</li><li>2. Exploratory Data Analysis with Python</li><li>3. Web Technologies</li></ol> | <ol style="list-style-type: none"><li>1. Fundamentals of Data Base Management System</li><li>2. JAVA Programming</li><li>3. Social Media Analytics</li></ol> |
| <b>OPEN ELECTIVE -III</b>   | <b>OPEN ELECTIVE -IV</b>   |
| <ol style="list-style-type: none"><li>1. Introduction to Machine Learning</li><li>2. Data Wrangling and Pre-processing</li><li>3. Block Chain Technologies</li></ol>    | <ol style="list-style-type: none"><li>1. Internet of Things</li><li>2. Fundamentals of Cloud Computing</li><li>3. Cyber Security</li></ol>                   |