

**BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI**  
**NEW COURSE STRUCTURE - To be effective from academic session**  
**2024-25 Based on NEP**  
**Recommended scheme of study for M.Tech. (AIML)**

| SEMESTER/<br>Session of<br>Study<br>(Recommended) | Course<br>Level | Category of<br>Course         | Course<br>Code | Courses                                             | Mode of delivery & credits<br><i>L- Lecture; T-Tutorial; P-<br/>Practicals</i> |                         |                         | Total<br>Credits<br><i>C-Credits</i> |
|---------------------------------------------------|-----------------|-------------------------------|----------------|-----------------------------------------------------|--------------------------------------------------------------------------------|-------------------------|-------------------------|--------------------------------------|
|                                                   |                 |                               |                |                                                     | L<br>(Periods/<br>week)                                                        | T<br>(Periods<br>/week) | P<br>(Periods<br>/week) | C                                    |
|                                                   |                 |                               |                | <b>THEORY</b>                                       |                                                                                |                         |                         |                                      |
| FIRST /<br>Monsoon                                | Fifth           | Programme<br>Core (PC)        | AI26501        | Modern<br>Artificial<br>Intelligence                | 3                                                                              | 0                       | 0                       | 3                                    |
|                                                   |                 |                               | AI26503        | Advanced<br>Concepts of<br>Supervised<br>Learning   | 3                                                                              | 0                       | 0                       | 3                                    |
|                                                   |                 |                               | AI26505        | Advanced<br>Concepts of<br>Unsupervised<br>Learning | 3                                                                              | 0                       | 0                       | 3                                    |
|                                                   |                 |                               | AI26507        | Linear<br>Algebra                                   | 3                                                                              | 0                       | 0                       | 3                                    |
|                                                   |                 |                               | CS26501        | Advanced Data<br>Structures and<br>Algorithm        | 3                                                                              | 0                       | 0                       | 3                                    |
|                                                   |                 |                               |                |                                                     |                                                                                |                         |                         | <b>15</b>                            |
|                                                   |                 |                               |                | <b>LABORATORIES</b>                                 |                                                                                |                         |                         |                                      |
|                                                   | Fifth           | Programme<br>Core (PC)<br>Lab | CS26502        | Advanced Data<br>Structures and<br>Algorithm Lab    | 0                                                                              | 0                       | 3                       | 1.5                                  |
|                                                   |                 |                               | AI26510        | Machine<br>Learning Lab                             | 0                                                                              | 0                       | 3                       | 1.5                                  |
|                                                   |                 |                               | AI26512        | Skill<br>Development<br>course – I                  | 0                                                                              | 0                       | 4                       | 2                                    |
|                                                   |                 |                               |                |                                                     |                                                                                |                         |                         | <b>5</b>                             |
|                                                   |                 |                               |                | <b>TOTAL</b>                                        |                                                                                |                         |                         | <b>15+5=20</b>                       |
| SECOND/<br>Spring                                 | Fifth           | Programme<br>Core (PC)        | AI26513        | Deep Learning                                       | 3                                                                              | 0                       | 0                       | 3                                    |

|                                   |       |                             |         |                               |   |   |   |          |         |
|-----------------------------------|-------|-----------------------------|---------|-------------------------------|---|---|---|----------|---------|
|                                   |       | Programme Elective (PE)     |         | PE I (Pool 1)                 | 3 | 0 | 0 | 3        |         |
|                                   |       |                             |         | PE II (Pool 2)                | 3 | 0 | 0 | 3        |         |
|                                   |       |                             |         | PE III (Pool 2)               | 3 | 0 | 0 | 3        |         |
|                                   |       |                             |         | PE IV (Pool 2)                | 3 | 0 | 0 | 3        |         |
|                                   |       |                             |         |                               |   |   |   |          | 15      |
|                                   |       | LABORATORIES                |         |                               |   |   |   |          |         |
|                                   | Fifth | Programme Core (PC) Lab     | AI26514 | Deep Learning Lab             | 0 | 0 | 3 | 1.5      |         |
|                                   |       | Programme Elective (PE) Lab |         | PE I Lab (Pool 1)             | 0 | 0 | 3 | 1.5      |         |
|                                   |       |                             | AI26516 | Skill Development course – II | 0 | 0 | 4 | 2        |         |
|                                   |       | TOTAL                       |         |                               |   |   |   |          | 15+5=20 |
| TOTAL FOR FIFTH LEVEL             |       |                             |         |                               |   |   |   | 20+20=40 |         |
| THIRD /Monsoon                    | Sixth | Programme Core (PC)         | AI26517 | Thesis Part I                 |   |   |   | 14       |         |
|                                   |       | Open Elective (OE)          | *       | OE 1/MOOC-I                   | 3 | 0 | 0 | 3        |         |
|                                   |       | Open Elective (OE)          | *       | OE 2/MOOC-II                  | 3 | 0 | 0 | 3        |         |
|                                   |       |                             |         |                               |   |   |   |          |         |
|                                   |       | TOTAL                       |         |                               |   |   |   |          | 14+6=20 |
| FOURTH/ Spring                    | Sixth | Programme Core (PC)         | AI26519 | Thesis Part II                |   |   |   | 20       |         |
|                                   |       | TOTAL                       |         |                               |   |   |   |          | 20      |
| TOTAL FOR SIXTH LEVEL             |       |                             |         |                               |   |   |   | 20+20=40 |         |
| GRAND TOTAL FOR M.TECH. PROGRAMME |       |                             |         |                               |   |   |   | 80       |         |

### List of Electives

| Course Code             | Courses                              | Mode of delivery & credits <i>L- Lecture; T- Tutorial; P- Practical</i> |   |   | Total Credits <i>C -Credits</i> |
|-------------------------|--------------------------------------|-------------------------------------------------------------------------|---|---|---------------------------------|
| Theory with Lab- Pool 1 |                                      |                                                                         |   |   |                                 |
| AI26521                 | Data Analysis and Interpretation     | 3                                                                       | 0 | 0 | 3                               |
| AI26523                 | Evolutionary Computing               | 3                                                                       | 0 | 0 | 3                               |
| CS26523                 | Computer Vision                      | 3                                                                       | 0 | 0 | 3                               |
| AI26522                 | Data Analysis and Interpretation Lab | 0                                                                       | 0 | 3 | 1.5                             |
| AI26524                 | Evolutionary Computing Lab           | 0                                                                       | 0 | 3 | 1.5                             |
| CS26524                 | Computer Vision Lab                  | 0                                                                       | 0 | 3 | 1.5                             |
| Theory- Pool 2          |                                      |                                                                         |   |   |                                 |
| AI26525                 | Large Language Models                | 3                                                                       | 0 | 0 | 3                               |
| AI26527                 | Agentic AI Systems                   | 3                                                                       | 0 | 0 | 3                               |
| AI26529                 | Concepts of Reinforcement Learning   | 3                                                                       | 0 | 0 | 3                               |
| CS26531                 | Quantum Computing                    | 3                                                                       | 0 | 0 | 3                               |
| AI26531                 | Network Analysis                     | 3                                                                       | 0 | 0 | 3                               |
| AI26533                 | Mining Massive Datasets              | 3                                                                       | 0 | 0 | 3                               |
| AI26535                 | Time Series Analysis                 | 3                                                                       | 0 | 0 | 3                               |
| AI26537                 | Outlier Analysis                     | 3                                                                       | 0 | 0 | 3                               |
| AI26539                 | Generative AI                        | 3                                                                       | 0 | 0 | 3                               |
| AI26541                 | Multimedia Databases                 | 3                                                                       | 0 | 0 | 3                               |

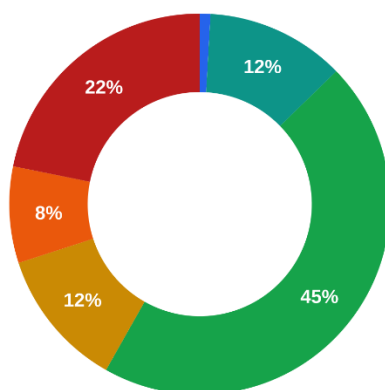
# M. Tech AIML COURSE MAPPING WITH BLOOM'S LEVELS

| Level     | Cognitive level   | Description                                               |
|-----------|-------------------|-----------------------------------------------------------|
| <b>L1</b> | <b>Remember</b>   | Recall facts, terms and basic concepts.                   |
| <b>L2</b> | <b>Understand</b> | Explain ideas or concepts in one's own words.             |
| <b>L3</b> | <b>Apply</b>      | Use knowledge to solve problems in new situations.        |
| <b>L4</b> | <b>Analyze</b>    | Break information into parts and examine how they relate. |
| <b>L5</b> | <b>Evaluate</b>   | Judge or justify a decision based on criteria.            |
| <b>L6</b> | <b>Create</b>     | Combine elements to produce new ideas or solutions.       |

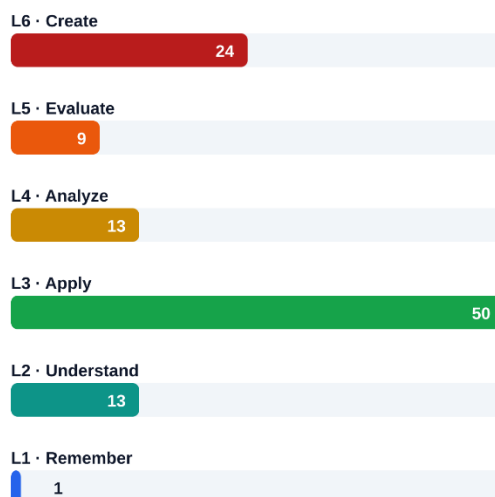
## Overall Programme Bloom's Distribution — M.Tech (AI & ML)

All 110 course outcomes across 22 courses, classified into Bloom's six cognitive levels.

SHARE BY LEVEL



OUTCOMES PER LEVEL



Higher-order thinking (Analyze + Evaluate + Create)

**46 (42%)**

Lower-order thinking (Remember + Understand + Apply)

**64 (58%)**

## Assessment Tool→ Bloom's level mapping

Legend: **L1** Remember **L2** Understand **L3** Apply **L4** Analyze **L5** Evaluate **L6** Create

### Semesters I & II

| Evaluation method          | Type   | L1       | L2         | L3    | L4      | L5       | L6     |
|----------------------------|--------|----------|------------|-------|---------|----------|--------|
|                            |        | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Quizzes                    | Theory | ✓        | ✓          | ✓     |         |          |        |
| Assignments                | Theory |          | ✓          | ✓     | ✓       |          |        |
| Seminar (before committee) | Theory |          | ✓          |       | ✓       | ✓        | ✓      |
| Semester-End Examination   | Theory | ✓        | ✓          | ✓     | ✓       |          |        |
| Day-to-day lab evaluation  | Lab    |          |            | ✓     | ✓       |          |        |
| Lab Viva                   | Lab    |          | ✓          | ✓     | ✓       | ✓        |        |
| Lab Quiz                   | Lab    | ✓        | ✓          | ✓     |         |          |        |
| End-Sem performance        | Lab    |          |            | ✓     | ✓       |          | ✓      |

### Semester III — Thesis Part I + MOOC / Open Elective

| Evaluation method               | Scope         | L1       | L2         | L3    | L4      | L5       | L6     |
|---------------------------------|---------------|----------|------------|-------|---------|----------|--------|
|                                 |               | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Progressive Evaluation          | Thesis Part I |          |            |       | ✓       | ✓        | ✓      |
| End Semester Presentation       | Thesis Part I |          |            |       | ✓       | ✓        | ✓      |
| MOOC / Open-Elective assessment | MOOC / OE     |          | ✓          | ✓     | ✓       | ✓        |        |

### Semester IV — Thesis Part II

| Evaluation method         | Scope          | L1       | L2         | L3    | L4      | L5       | L6     |
|---------------------------|----------------|----------|------------|-------|---------|----------|--------|
|                           |                | Remember | Understand | Apply | Analyze | Evaluate | Create |
| Progressive Evaluation    | Thesis Part II |          |            |       | ✓       | ✓        | ✓      |
| End Semester Presentation | Thesis Part II |          |            |       | ✓       | ✓        | ✓      |