**JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY
DEPARTMENT OF COMPUTER APPLICATIONS**

**M.Sc. AI/ML**

**Course Curriculum**

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| **M.Sc. AI &ML**  |
| **First Semester** |
|  | **Credit Structure** |  |
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Credits** | **Contact Hours** |
| **1** | 25M21CA111 | Artificial Intelligence | 3 | 0 | 0 | 3 | 3 |
| **2** | 25M21CA112 | Python Programming | 2 | 1 | 0 | 3 | 3 |
| **3** | 25M21CA113 | Data Structure and Algorithms | 3 | 1 | 0 | 4 | 4 |
| **4** | 25XXXXXX | Mathematics for AI & ML -I | 3 | 0 | 0 | 3 | 3 |
| **5** | 25M22CA111 | PEC-I | 3 | 0 | 0 | 3 | 3 |
| **6** | 25M21CA511 | Artificial intelligence Lab | 0 | 0 | 1 | 1 | 2 |
| **7** | 25M21CA512 | Python Programming Lab  | 0 | 0 | 2 | 2 | 4 |
| **8** | 25M21CA513 | Data Structure and Algorithms lab | 0 | 0 | 1 | 1 | 2 |
| **Total credits** | **20** | **24** |

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| **M.Sc. AI &ML**  |
| **Second Semester** |
|  | **Credit Structure** |  |
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Credits** | **Contact Hours** |
| **1** | 25XXXXXX | Machine Learning | 3 | 0 | 0 | 3 | 3 |
| **2** | 25XXXXXX | Natural Language Processing (NLP) | 3 | 0 | 0 | 3 | 3 |
| **3** | 25XXXXXX | Ethical Implications of AI (SEC-I) | 2 | 0 | 0 | 2 | 2 |
| **4** | 25XXXXXX | Mathematics for AI & ML- II | 3 | 0 | 0 | 3 | 3 |
| **5** | 25XXXXXX | Personality Development & Decision-making skills (HSC) | 2 | 0 | 0 | 2 | 2 |
| **6** | 25XXXXXX | PEC-II | 3 | 0 | 0 | 3 | 3 |
| **7** | 25XXXXXX | PEC-III | 3 | 0 | 0 | 3 | 3 |
| **8** | 25XXXXXX | Machine Learning lab | 0 | 0 | 1 | 1 | 2 |
| **9** | 25XXXXXX | Natural Language Processing (NLP) Lab | 0 | 0 | 1 | 1 | 2 |
| **Total credits** | **21** | **23** |

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| **M.Sc. AI &ML**  |
| **Third Semester** |
|  | **Credit Structure** |  |
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Credits** | **Contact Hours** |
| **1** | 25XXXXXX | Neural Network & Deep learning | 3 | 0 | 0 | 3 | 3 |
| **2** | 25XXXXXX | Generative AI | 2 | 0 | 0 | 2 | 2 |
| **3** | 25XXXXXX | Information Rertrieval & Semantic Web | 3 | 0 | 0 | 3 | 3 |
| **4** | 25XXXXXX | PEC-IV | 3 | 0 | 0 | 3 | 3 |
| **5** | 25XXXXXX | PEC-V | 3 | 0 | 0 | 3 | 3 |
| **6** | 25XXXXXX | Entrepreneurship and Start-up ecosystem(SEC-II) | 2 | 0 | 0 | 2 | 2 |
| **7** | 25XXXXXX | Neural Network & Deep learning lab | 0 | 0 | 1 | 1 | 1 |
| **8** | 25XXXXXX | Generative AI Lab | 0 | 0 | 1 | 1 | 2 |
| **9** | 25XXXXXX | Information Rertrieval & Semantic Web Lab | 0 | 0 | 1 | 1 | 2 |
| **Total credits** | **19** | **21** |

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| **Fourth Semester** |
|  | **Credit Structure** |  |
| **S.No.** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Credits** | **Contact Hours** |
| **1** | 25XXXXXX | Capstone Project/ Master Thesis | 0 | 0 | 15 | 15 | 30 |
| **2** | 25XXXXXX | Term Paper | 0 | 0 | 0 | 5 | 0 |
| **Total credits** | **20** | **30** |
|  | **Overall Total Credits in Programme** | **80** |

 **List of Subjects**

|  |  |  |
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| **Sr. No.** | **PCC: Professional Core Courses**  | **Category** |
| **1** | Artificial Intelligence | PCC-I |
| **2** | Python Programming | PCC-II |
| **3** | Data structures & Algorithm | PCC-III |
| **4** | Machine Learning | PCC-V |
| **5** | Natural Language Processing (NLP) | PCC-VI |
| **6** | Neural Network & Deep learning | PCC-VI |
| **7** | Natural Language Processing (NLP) | PCC-VIII |
| **8** | Generative AI | PCC-IX |
| **9** | Information Retrieval & Semantic web | PCC-X |
| **10** | Artificial intelligence Lab | PCC-XI (Lab -I) |
| **11** | Python Programming Lab  | PCC-XII (Lab -II) |
| **12** | Data structures & Algorithm lab | PCC-XIII (Lab-III) |
| **13** | Machine Learning lab | PCC-XIV(Lab-IV) |
| **14** | Natural Language Processing (NLP) Lab | PCC-XV (Lab-V) |
| **15** | Neural Networks and Deep Learning lab | PCC-XVI (Lab-VI) |
| **16** | Generative AI Lab | PCC-XVII (Lab-VII) |
| **17** | Information Retrieval & Semantic web Lab | PCC-XVIII (Lab-VIII) |
|  | **PEC: Professional Elective Course** | **Category** |
| **1** | Data Mining & Warehousing | PEC |
| **2** | Data Reduction & Visualization | PEC |
| **3** | Reinforcement Learning | PEC |
| **4** | Principles of Explainable AI | PEC |
| **5** | FATE in AI models  | PEC |
| **6** | Quantum Machine Learning | PEC |
| **7** | Responsible AI | PEC |
| **8** | Deep Learning for Language And Speech Technologies | PEC |
| **9** | Deep Learning for Computer Vision | PEC |
| **10** | Robotics Process Automation | PEC |
| **11** | 3D Graphics and Animation | PEC |
| **12** | Soft Computing | PEC |
| **13** | Data Engineering and Management | PEC |
| **14** | Big Data Frameworks | PEC |
| **15** | Cloud Computing Ecosystem | PEC |
| **16** | Image Processing and Video analytics | PEC |
| **17** | Computer vision | PEC |
| **18** | Social Network Analysis | PEC |
| **19** | Internet of Things(IOT) | PEC |
| **20** | Cyber Security | PEC |
| **21** | Ethical Hacking and Prevention | PEC |
|  | **Multidiscilplinary Core( MDC)** | **Category** |
| **1** | Mathematics for AI & ML -I | PCC-IV |
| **2** | Mathematics for AI & ML -II | PCC-VII |
|  | **Skill Enhancement Core (SEC)** | **Category** |
| **1** | Ethical Implications of AI | SEC-I |
| **2** | Entrepreneurship and Start-up ecosystem | SEC-II |
| **3** | Design Thinking and Innovation | SEC |
| **4** | Professional ethics | SEC |
| **5** | Technical Communication | SEC |
|  | **Humanities & Social Science Course (HSC)** | **Category** |
| **1** | Personality Development & Decision-making Skills | HSC |