## Centre for Artificial Intelligence
### B. Tech. in Artificial Intelligence and Data Science (AI & DS)

## COURSE STRUCTURE

*(Tentative)*

| I SEMESTER | II SEMESTER | III SEMESTER | IV SEMESTER | V SEMESTER | VI SEMESTER | VII SEMESTER | VIII SEMESTER |
|---|---|---|---|---|---|---|---|
| Foundations of Data Science | Modern Computer Architecture | Probability & Random process | Calculus & Optimization techniques | Data Mining & Warehousing | Deep Learning | Departmental Elective (DE-3) | Departmental Elective (DE-5) |
| Internet & Web Technologies | Object Oriented Programming | Design and Analysis of Algorithms | Theory of Computation | Cloud Computing & Virtualization | Big Data Analytics | Departmental Elective (DE-4) | Open Category Course (OC-3) |
| Digital Logic Design | Discrete Structures | Computer Networks | Network & Web Security | Soft Computing Techniques | Departmental Elective (DE-2) | Open Category Course (OC-2) | Industry Internship/ Research Internship/ Innovation & Start-up |
| Problem Solving & Programming | Data Structures | Database Management System | Data Science | Departmental Elective (DE-1) | Open Category Course (OC-1) | Specialization Course (SPC-3) | Professional Development |
| Linear Algebra | Basic Electrical & Electronics Engineering | Operating Systems | Software Engineering | Specialization Course (SPC-1) | Specialization Course (SPC-2) | Creative Problem Solving | Honours or Minor Degree (Optional) |
| Problem Solving & Programming Lab | Data Structures Lab | Design Analysis and Algorithm Lab | Data Science Lab | Data Mining & Warehousing Lab | Deep Learning Lab | Honours or Minor Degree (Optional) | |
| Internet & Web Technologies Lab | Object Oriented Programming Lab | Problem Solving through Python Programming | Java programming Lab | Cloud Computing & Virtualization Lab | Data handling & Visualization Lab | | |
| Novel Engaging Course | Basic Electrical & Electronics Engineering Lab | Novel Engaging Course | Competitive Programming lab | Cornerstone Project | Capstone Project | | |
| Language Lab | Novel Engaging Course | Macro Project-I | Novel Engaging Course | Supply Chain Management | Disaster Management | | |
| Micro Project-I | Micro Project-II | Cyber Security | Macro Project-II | Honours or Minor Degree (Optional) | Honours or Minor Degree (Optional) | | |
| Universal Human Values & Professional Ethics (UHVPE) | Sustainability & Environmental Science | Skill Internship Program-II | Project Management, Economics & Financing | | | | |
| Skill Internship Program-I | | | Honours or Minor Degree (Optional) | | | | |

**Legend:**

| Color | Category |
|---|---|
| (Green) | Departmental Core Courses |
| (Cyan) | Basic Science Courses |
| (Magenta) | Engineering Science Courses |
| (Dark Green) | Mandatory Audit Courses |

**Note:**
1. *Mandatory Workshops in each semester at Department Level (Duration: Two Days)*

# माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत

## MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA

**Deemed University**
**(Declared under Distinct Category by Ministry of Education, Government of India)**
**NAAC ACCREDITED WITH A++ GRADE**

**Centre for Artificial Intelligence**

| Departmental Elective Courses | |
|:---:|:---:|
| **B. Tech. in Artificial Intelligence and Data Science (AI & DS)** | |
| Principles of Compiler Design | Software Conceptual Design |
| Generative AI | Responsible and Safe AI System |
| Pattern Recognition | Deep Learning for Computer Vision |
| Ethics in Engineering Practice | System Analysis & Design |
| Introduction to Quantum Computing | Applied Accelerated AI |
| Cryptography and Network Security | Big Data Computing |
| Augmented and Virtual Reality | Multi-Core Computer Architecture |
| Distributed Optimization and Machine Learning | Applied Artificial Intelligence |
| Microprocessors & Microcontrollers | Computational Complexity |
| Embedded Systems | Artificial Intelligence for Economics |
| Advanced Computer Architecture | Ethics in Engineering Practice |
| Natural Language Processing | Big Data Computing |
| Reinforcement Learning | Introduction to Internet of Things |
| **Open Category Courses** | |
| Ethics and Technology | Human-Computer Interaction (HCI) |
| Design Thinking and Innovation | Linguistics and Natural Language Processing |
| Software Testing | Entrepreneurship and Innovation |
| Complex Systems and Network Theory | Creative Writing and Communication |
| Intellectual Property Rights and Cyber Law | Game Theory and Strategic Decision Making |
| **Specialization Courses Tracks** | |
| **Specialization in Augmented and Virtual Reality** | **Specialization in Cyber Security** |
| Foundations of AR-VR | Blockchain |
| 3D Modelling | Digital Forensics |
| Game Design | Biometric Security |
| Animation Design Theory | Ethical Hacking |