

B.Tech. Artificial Intelligence and Data Science



Complete Curriculum Guide for I to VIII Semesters - Academic Regulations 2023 (R23) from Er. Perumal Manimekalai
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Foundation Semesters: Building the Base

Semester I

- Matrices and Calculus
- Engineering Physics
- Engineering Chemistry
- Engineering Graphics
- Professional English I
- Heritage of Tamils
- Physics and Chemistry Laboratory

Semester II

- Statistics and Numerical Methods
- Physics for Information Science
- Basic Electrical & Electronics Engineering
- Foundation of AI and Data Science
- Problem Solving using Python Programming
- Professional English II
- Tamils and Technology
- Civil and Mechanical Engineering Practices
- Electrical and Electronics Laboratory
- Wellness

The first two semesters establish a strong foundation in mathematics, basic sciences, and engineering fundamentals while introducing students to programming concepts and AI/Data Science basics.

Core Development Phase: Semesters III & IV

Semester III

- Linear Algebra
- Digital Principles and System Design
- Database Design and Management
- Data Structures Design
- Fundamentals of Data Science and Analytics
- Database Design and Management Laboratory
- Data Science and Analytics Laboratory
- Extension Activities
- Mandatory Course 3 I (Non-Credit)

Semester IV

- Environmental Science & Sustainability
- Artificial Intelligence and Problem Solving Techniques
- Machine Learning
- Data Exploration and Visualization
- Operating Systems Applications
- Machine Learning Laboratory
- Mandatory Course 3 II (Non-Credit)
- Extension Activities
- In-plant Training/Internship (2 weeks)

These semesters introduce core computer science concepts, data structures, databases, and begin specialized AI/ML coursework with hands-on laboratory experience.

Specialization Begins: Semester V

01

Core Subjects

Universal Human Values & Ethics provides ethical foundation while Computer Networks establishes networking fundamentals essential for modern AI applications.

02

Advanced AI/ML

Deep Learning course introduces neural networks, while Professional Electives I & II allow students to choose specialized areas of interest.

03

Practical Application

Computer Networks Laboratory and Deep Learning Laboratory provide hands-on experience with cutting-edge technologies.

04

Professional Development

Professional Development-I focuses on soft skills, communication, and career preparation alongside Industry Lecture series.

Semester V includes continued In-plant Training/Internship opportunities (2 weeks) to bridge academic learning with industry experience.

Advanced Applications: Semester VI

Information Security

Comprehensive coverage of cybersecurity principles, cryptography, and secure system design essential for AI/Data Science applications.

R Programming for Data Science

Statistical programming language widely used in data analysis, machine learning, and statistical modeling.

Professional Electives III & IV

Advanced specialization courses allowing students to focus on specific areas like computer vision, NLP, or big data analytics.

Open Electives

- Open Elective-I (Entrepreneurship)
- Open Elective-II

One Open Elective must be chosen from Management verticals to develop business acumen.

Skill Development

- Professional Development-II
- Technical Skill Development-I
- Industry Lecture-II
- Information Security Laboratory

Capstone and Specialization: Semester VII



Embedded Systems and IoT

Understanding microcontrollers, real-time systems, and hardware-software integration crucial for IoT applications.



Professional Electives V & VI

Advanced specialization in areas like robotics, computer vision, natural language processing, or big data technologies.



Project Phase-I

Beginning of capstone project work, applying learned concepts to solve real-world problems in AI/Data Science.

Additional Components

- Open Electives III & IV
- IoT Laboratory
- Technical Skill Development II
- In-plant Training/Internship

Extended industry exposure and practical application of academic knowledge through hands-on experience with Internet of Things devices, sensors, and connectivity protocols.

Final Semester: Project Completion

Project Phase II

Completion of the capstone project demonstrating mastery of AI and Data Science concepts through practical implementation and research.

Internship Option

Alternative 3-6 month internship program providing extensive industry experience and professional networking opportunities.

Semester VIII represents the culmination of the academic journey, where students demonstrate their ability to apply four years of learning to solve complex, real-world problems in artificial intelligence and data science.

Students can choose between completing their capstone project or undertaking an extended internship, both designed to prepare them for successful careers in the rapidly evolving field of AI and Data Science.

Key Laboratory Experiences



Early Foundation Labs

Physics and Chemistry Laboratory, Civil and Mechanical Engineering Practices, and Electrical and Electronics Laboratory establish practical skills.



Core Programming Labs

Database Design and Management Laboratory, Data Science and Analytics Laboratory, and Machine Learning Laboratory build technical expertise.



Advanced Technology Labs

Computer Networks Laboratory, Deep Learning Laboratory, and Information Security Laboratory provide cutting-edge experience.



Emerging Technology Labs

IoT Laboratory and R Programming for Data Science offer exposure to latest industry trends and tools.

Practical Skills Development

Laboratory courses are integrated throughout the curriculum to ensure students gain hands-on experience with:

- Programming languages and frameworks
- Data analysis and visualization tools
- Machine learning and AI platforms
- Network security and IoT devices

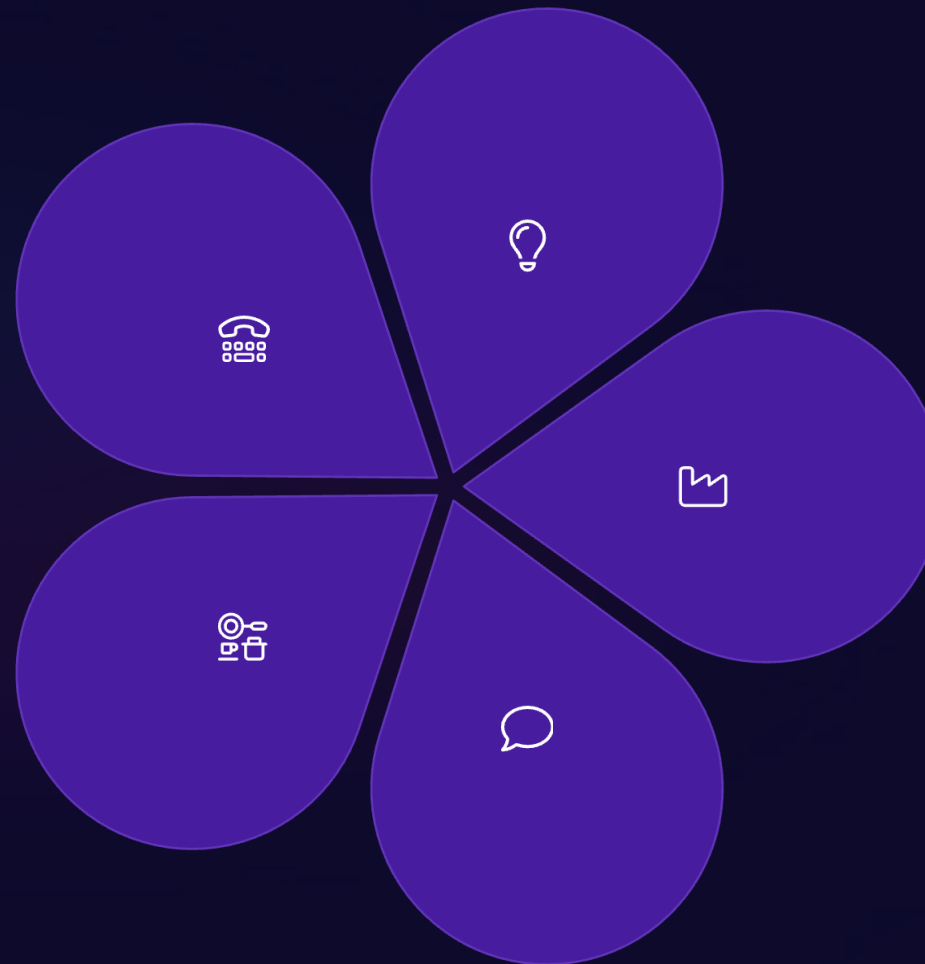
Professional Development and Industry Readiness

Communication Skills

Professional English I & II, along with Professional Development courses, build essential communication abilities.

Technical Skills

Technical Skill Development I & II courses keep students current with rapidly evolving technology landscape.



Innovation Mindset

Extension Activities and Open Electives encourage creativity and entrepreneurial thinking.

Industry Exposure

Multiple internship opportunities and Industry Lecture series provide real-world experience and networking.

Ethical Foundation

Universal Human Values & Ethics ensures graduates understand the social responsibility of AI and Data Science.

The curriculum is designed to produce graduates who are not only technically competent but also ethically grounded, professionally skilled, and ready to contribute meaningfully to the advancement of artificial intelligence and data science.

This comprehensive 8-semester program prepares students for successful careers in AI/Data Science while fostering innovation, ethical thinking, and lifelong learning capabilities essential for leadership in this rapidly evolving field.