

## **M.Tech. (ICT): Detailed Program Structure**

### **Specialization: Software Systems**

#### **Semester-I**

- Communication and Technical Writing (2 credit)
- Programming lab (3 credit)
- Specialization Core I: Advanced Algorithm (4 credit)
- General Elective (Maths) (3/4 credit)
- General Elective (Technical) (3/4 credit)

#### **Semester-II**

- Specialization Core II – Advanced Software Engineering (4 credit)
- Minor Project (3 credit)
- Specialization Elective I (3/4 credit)
- Specialization Elective II (4/3 credit)

**Summer:** Major Project I (4 credit)

#### **Semester-III**

- Major Project I (Continued) (6 credit)
- Specialization Elective III (3/4 credit)
- Specialization Elective IV (4/3 credit)

#### **Semester-IV**

- Major Project II/Industrial Training Project (12 credit)

### **Representative List of General Elective (Mathematics)**

- Probability & Random Variables
- Linear Algebra
- Optimization
- Graph Theory
- Any other relevant course

### **Representative List of General Elective (Technical)**

- Operating Systems
- Machine Learning
- Natural Language Processing
- Cloud computing

- Artificial Intelligence
- Human Computer Interaction
- Any other relevant course

### **Representative List of Specialization Electives I and II**

- Distributed Systems
- Distributed Databases
- Approximation Algorithms
- Information Security
- Multimedia Security & Forensic
- Any other relevant course

### **Representative List of Specialization Elective III and IV**

- Big Data Processing
- Blockchains and Cryptocurrency
- Advanced Computer Networks
- Software Specification and Verification
- Any other relevant course

### **Specialization: Machine Learning Semester-I**

- Communication and Technical Writing (2 credit)
- Programming lab (3 credit)
- Specialization Core I: Foundations of Machine Learning (4 credit)
- General Elective (Maths) (3/4 credit)
- General Elective (Technical) (3/4 credit)

### **Semester-II**

- Specialization Core II – Advanced Machine Learning (4 credit)
- Minor Project (3 credit)
- Specialization Elective I (3/4 credit)
- Specialization Elective II (4/3 credit)

**Summer:** Major Project I (4 credit)

### **Semester-III**

- Major Project I (Continued) (6 credit)
- Specialization Elective III (3/4 credit)
- Specialization Elective IV (3/4 credit)

### **Semester-IV**

- Major Project II/Industrial Training Project (12 credit)

### **Representative List of General Elective (Mathematics)**

- Probability & Statistics
- Linear Algebra
- Optimization
- Graph Theory
- Any other relevant course

### **Representative List of General Elective (Technical)**

- Advanced Algorithm
- Cloud computing
- Artificial Intelligence
- Human Computer Interaction
- Any other relevant course

### **Representative List of Specialization Electives I and II**

- Digital Image Processing

- Information Retrieval
- Recommendation System
- Adversarial Machine Learning
- Deep Learning
- Multimedia Security & Forensic
- Speech Technology
- Any other relevant course

### **Representative List of Specialization Elective III and IV**

- Computer Vision
- Natural Language Processing
- Reinforcement Learning
- Computational Shape Modeling
- Wavelet Image Processing
- Time Series Forecasting
- Any other relevant course

### **Specialization: VLSI & Embedded Systems Semester-I**

- Communication and Technical Writing (2 credit)
- Programming lab (3 credit)
- Specialization Core I: VLSI System Design (4 credit)
- General Elective (Maths) (3/4 credit)
- General Elective (Technical) (3/4 credit)

### **Semester-II**

- Specialization Core II – Embedded Hardware Design (4 credit)
- Minor Project (3 credit)
- Specialization Elective I (3/4 credit) - Choose any one
  - ASIC Design
  - Analog VLSI Design
- Specialization Elective II (4/3 credit) - Choose any one
  - Digital System Architecture
  - Cyber Physical Systems and IoT

**Summer:** Major Project I (4 credit)

### **Semester-III**

- Major Project I (Continued) (6 credit)
- Specialization Elective III (3/4 credit)
- Specialization Elective IV (3/4 credit)

### **Semester-IV**

- Major Project II/Industrial Training Project (12 credit)

### **Representative List of General Elective (Mathematics)**

- Probability & Random Variables
- Linear Algebra
- Optimization
- Graph Theory
- Any other relevant course

### **Representative List of General Elective (Technical)**

- Digital Programming
- Internet of Things

- Machine Learning
- Robotics
- Edge Computing
- Any other relevant course

### **Representative List of Specialization Electives I and II**

- ASIC Design
- Analog VLSI Design
- Digital System Architecture
- Cyber Physical Systems and IoT
- Any other relevant course

### **Representative List of Specialization Elective III and IV**

- VLSI Testing and Verification
- Low Power VLSI Design
- VLSI for Digital Signal processing
- Device Modeling and Simulation
- Nanoelectronics
- Any other relevant course

## **Specialization: Wireless Communications and Signal Processing**

### **Semester-I**

- Communication and Technical Writing (2 credit)
- Programming lab (3 credit)
- Specialization Core I: Introduction to Wireless Communication (4 credit)
- General Elective (Maths) (3/4 credit)
- General Elective (Technical) (3/4 credit)

### **Semester-II**

- Specialization Core II – Advanced Digital Signal Processing (4 credit)
- Minor Project (3 credit)
- Specialization Elective I (3/4 credit)
- Specialization Elective II (4/3 credit)

**Summer:** Major Project I (4 credit)

### **Semester-III**

- Major Project I (Continued) (6 credit)
- Specialization Elective III (3/4 credit)
- Specialization Elective IV (4/3 credit)

### **Semester-IV**

- Major Project II/Industrial Training Project (12 credit)

### **Representative List of General Elective (Mathematics)**

- Probability & Random Variables
- Linear Algebra
- Optimization
- Graph Theory
- Any other relevant course

### **Representative List of General Elective (Technical)**

- Wireless System Design
- Detection and Estimation Theory
- Any other relevant course

### **Representative List of Specialization Electives I and II**

- Advanced Wireless Communication
- Application of ML to Wireless Communication Systems
- Speech Technology
- Digital Image Processing
- Any other relevant course

### **Representative List of Specialization Elective III and IV**

- Next Generation Communication Systems
- Cyber-Physical Systems and Internet of Things
- Adaptive Signal Processing
- Any other relevant course

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