

The ECE department's syllabus for the Fall 2025 PhD entrance exam is as follows:

- **Part A:**
  - Basic mathematics
  - Basic programming in C, Python
  - Basics of signals and systems
  - Basics of electrical circuits with passive and active devices
- **Part B:** Student will be required to select one of the following sections, and will be considered for completing Ph.D. in that same area.
  - **Section I: Electric Vehicles**
    - Different types of ADC, DAC, inverters, converters
    - Servo motors
    - Basics of Control Systems and Power Electronics
  - **Section II: Communication Systems**
    - Basics of analog and digital communication
    - Signals and systems
    - Digital Signal Processing
    - Probability and random processes
  - **Section III: VLSI**
    - Digital system design, basics of gates, muxes, counters.
    - Operation of MOS transistors
    - Scaling, effects of scaling
    - Switching characteristics of transistors
    - Interconnect effects, delay models, active and leakage power.
  - **Section IV: Embedded Systems**
    - Programmable devices
    - RTOS
    - Microprocessor architecture
    - Sensors and sensor calibration
  - **Section V: Computer Vision**

- Sampling and quantization of an image
- Edge detection techniques
- Generation/Interpretation of an image histogram
- Machine Learning concepts