# MINOR PROJECT

**ENEX 353**

**Credit :1** **Year: III** **Part: II**

**Course Objectives:**

The objective of this course is to enable students to carry out a small-scale engineering research- or product-based project in the field of electronics, communication, and information engineering, thereby developing practical skills and hands-on experience in system design, implementation, and testing.

**General Procedures**

Under the supervision of the assigned supervisor, students will be organized into groups of 3–4 members. Each group will select a project topic related to electronics, communication, and information engineering, with emphasis on areas such as embedded systems (Arduino, Raspberry Pi, and microcontrollers), Internet of Things (IoT) systems and applications, FPGA hardware and software platforms, signal and image processing (MATLAB, Simulink, and Python libraries such as NumPy, SciPy, and OpenCV), communication systems (GPS, GSM, Bluetooth, Wi-Fi, and network simulators), instrumentation and data acquisition (sensors, DAQ systems, and LabVIEW), and circuit design (PCB fabrication, simulation, and prototyping). Students may conduct field visits or collect real-world datasets where appropriate. Each group will systematically complete the project through stages including topic selection, planning, development, testing, documentation, and final presentation. Continuous guidance, monitoring, and feedback will be provided by the supervisor throughout the course.

**1 Project Selection and Planning**

- 1.1 Selection of minor project based on theory/practical subject studied or as per the research or industry needs
- 1.2 Problem identification and scope definition
- 1.3 Approval of project by the department

**2 Literature Review and Proposal**

- 2.1 Basic literature review and background study, study of existing systems in case of product based project
- 2.2 Preparation of brief project proposal including objective and methodology
- 2.3 Selection of hardware/software tools, technologies, and resources (Development board, simulation software, hardware components, sensors, embedded programming languages, embedded IDEs)

**3 Design, Development and Project Management**

3.1 Design and development (Software/hardware/hybrid system)
3.2 Application of programming, circuit design, and hardware design skills
3.3 Integration of concepts from different subjects (Signals and systems, communication system, instrumentation system, microprocessor, computer organization and architecture, embedded system, electronic devices and circuits)
3.4 Applications of project management skills such as work division, time management, leadership

**4 Implementation and Testing**

4.1 Implementation and deployment of the project
4.2 Testing and validation of the developed system (Unit testing, integration testing, and user testing)
4.3 Performance evaluation and improvement

**Timeline of the defense**

i. Proposal submission and defense: A group of students shall submit the proposal in the prescribed format to the concerned department within two weeks after the commencement of the sixth semester
ii. Mid-term defense: The mid-term defense of the minor project shall be conducted one month prior to the final defense
iii. Final defense: The final defense shall be conducted two weeks prior to the board examination

**Evaluation**

The final evaluation of the minor project shall be based on assessments from the supervisor, the proposal defense, mid-term defense, final defense, and the internal examiner. The respective weightage and total marks are presented in the following table:

| Supervisor | Defense | | | Internal Examiner | Total Marks |
|---|---|---|---|---|---|
| | Proposal | Mid-Term | Final | | |
| 25 | 5 | 5 | 5 | 10 | 50 |