# GUJARAT TECHNOLOGICAL UNIVERSITY

## BRANCH NAME: POWER ELECTRONICS (24)

## SUBJECT NAME: Project-I

## Subject Code: 2170001

## BE SEMESTER VII

**Type of Course:** Engineering Science (Electronics)

**Prerequisite:**

**Rationale:**

This is a laboratory oriented subject focusing on enhancing practical, design, presentation and project management skills required for Power Electronics. This is based on the topics/subjects already covered in previous semesters and subjects of current semester.

**Teaching and Examination Scheme:**

| Teaching Scheme | | | Credits | Examination Marks | | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| L | T | P | C | Theory Marks | | | Practical Marks | | | |
| | | | | ESE (E) | PA (M) | | PA (V) | | PA (I) | |
| | | | | | PA | ALA | ESE | OEP | | |
| 0 | 0 | 4 | 4 | 00 | 00 | 00 | 50 | 100 | 50 | 150 |

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; E- Exam; M- Mid Semester; V- Viva; I- Internal; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment; OEP- Open Ended Problems; ALA- Active Learning Assignments.

**Learning Objectives:**

Objectives of the subject are to

1. Develop capacity in students to use the theory learnt to put in to practice.
2. Develop understanding of inter subject relationship among various subjects.
3. Develop capacity to find logical solution and implement the same practically.
4. Develop ability to develop capacity to design practical power electronics design.
5. Develop capacity in students to find and solve common faults arising in various electronic circuits and software development.
6. Minimize mistakes commonly made by the students during laboratory work.
7. Develop technical report writing & technical presentation skills in students.
8. Develop attitude for team work in students.

**Guidelines for work to be carried out during the semester:**

The students should decide the project title for 8$^{th}$ semester major project and carry out base work for the same as stated below:

1. Students should be divided into groups of 3-4 students each.
2. D**esign of power electronics system must be included** as part of the work to be done.
3. Each group will select a title for the final semester major project work. Alternatively, a faculty guide may give the problem statement. This is for UDP (user defined project). If, student is working in industry, he will have to carry out work assigned by industry (Industry Defined Project). They will prepare following as part of the subject during the term in phase for the work to be done.

| Phase No. | Duration | Work to be done |
|---|---|---|
| 1 | 1 month at beginning of the term | • finalize IDP or UDP title and register the same.<br>• Prepare problem statement, work plan and submit it to the department and get it authenticate through guide and HoD. |

| Phase No. | Duration | Work to be done |
|---|---|---|
| | | • understand the conceptual fundamentals behind the tentative major project work to be carried out in semester 8.<br>• prepare specifications<br>• prepare the block diagram.<br>• prepare presentation and demonstrate the same to guide. |
| 2 | 1 month after 1st phase | • identify inputs, outputs and their characteristics for each block.<br>• prepare the design of each block and verify the same through appropriate simulation software.<br>• Prepare presentation and demonstrate the same to guide. |
| 3 | 1 month after 2nd phase | • build individual hardware blocks of the system<br>• test individual hardware blocks<br>• modify design of individual blocks if required<br>• prepare presentation and demonstrate the same to guide. |
| 4 | After 3rd phase and up to 1 week before end of the term | • prepare implementation and testing plans for the hardware and/or software for the proposed design.<br>• prepare PCB design of the tested blocks, prepare part of the software etc.<br>• prepare report of the work done.<br>• Prepare presentation of the whole work and demonstrate the same to guide. |

**Suggested Specification table with Marks (Theory):**

| **Distribution of Theory Marks** | | | | |
|---|---|---|---|---|
| **Remembrance R Level** | **Understanding U Level** | **Application A Level** | **Analyse N Level** | **Evaluate E Level** |
| **0%** | **35%** | **35%** | **15%** | **15%** |

**Legends: R: Remembrance; U = Understanding; A = Application and above Levels (Revised Bloom's Taxonomy)**

**Guidelines for presentations and report:**

**Report:**

- A final report (around 30 to 60 pages) of the work carried out during the semester should be prepared and submitted before term ending and defended during the viva-voce examination.
- The report should
  - Include work carried out and results obtained.
  - fulfill the format specified.
  - include necessary documents and references.
  - Include design calculations, necessary diagrams, equations and other necessary details.

**Presentation:**

- Each presentation should have
  - the names of group members
  - the decided project title along with brief description
  - theoretical study work related to the project

    - block diagrams of the project and i/p-o/p signals & characteristics of each block
    - work done in earlier phase (except for first phase).
- Presentations should be given by each group during the semester as per schedule mentioned in guidelines.
- Final presentation should include work of the whole semester (i.e. phase – 1 to phase-4).

**Continuous Evaluation:**

- The Students' group should keep a record book for the subject.
- They should note down the work done, references, calculations, results obtained etc. in the record book.
- A project progress card should be maintained and get it signed periodically by Industry and Faculty guide.
- The progress card should be attached in the record book.
- The project report mentioned earlier should be based on this record book.