Electronics & Telecommunication Engineering

Academic Year – 2019-20	Class: TE
Semester – II	Date : 03/02/2020
CO: CO1, CO2, CO6	PO: PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12

Innovative Teaching Methods

Title of Innovation method/activity: Innovative Teaching Learning Method for Power Electronics with Advanced Processor Design, Implement and Test the circuit using simulation software to obtain the desired output

1. Name of Faculty: Mr. B. J. Pawar

2. Subject: Power Electronics

3. Objective of Method: As per the task ahead -

   I. Create the awareness of electronic component selection

   II. Analyze the various power electronic devices

   III. Design & assemble of complete electronic circuit

   IV. Examine the results of designed electronic circuit using modern tool like simulation software

4. **Topic Covered through Activity**:

   Design of gate driver circuit for controlled rectifier using thyristors

5. **Description of method with Benefits (8 – 10 lines):**

From the given task, students think on the various ways of design of electronic circuits to obtain the results. Among their formed group of 5 members, they discuss on various parameters to be acquire as per shown in the task. As the output of designed circuit is shown as a variable, the students have to use controlled electronic devices as the basics of the same they studied. For the controlling as well as for protection of controlled devices, the students have to think on minimum and maximum gate drive requirement and also on isolation circuits. As an individual or group, the student also learns that how to select and adjust the parameters of source which is available in the simulation tool. After their design on paper, they use simulation tool to check the results and to prepare a report on the same work they done.

The method:

1. The assigned task is completed by a team only.
2. All teams are continuously under the observation of teachers as an engineering ethics to check which various Medias the students are using for the paper work design and simulation.
3. Also, all teams are continuously under the observation by teachers for the following portfolios-
    - Selection of proper components
    - Design of complete circuit on paper
    - Programming using LPC2148
    - Simulation of designed circuit
    - Result, References used and report writing
4. All teams are asked to submit the scan copies of paper work design, report and simulation results to the Google classroom.
5. Teacher examined thoroughly the data received on Google classroom and finalized the winner and runner-up teams.
6. The opportunity is given to join free embedded course for winner and runner-up teams at MoU MVP-Innova training center.

Roles and Responsibilities

- **Teacher**
    - Provide the design and development task as per the basics studied by the student.
    - Develop the awareness among the students about the applications of power devices.
    - Provide the study material and appropriate guide lines at every stage
    - Remain available during the completion of task.
    - Prepare assessment methodology.
- **Student**
    - Go through all the material provided on various electronic devices
    - Once topic assigned, understand and discuss individually within the group.
    - Actively participate in group and contribute by means of discussion

- **Group**
    - Form the group of members as per the guidelines by teachers.
    - Understand and discuss to finalize the best solution for the assigned task.
    - Assign the work within the group to achieve the task within stipulated time period.

6. Assessment Tools &Rubrics:

Sr. No.	Portfolio	Marks
1.	**Selection of proper components**	
	i. Step-down transformer 12V	1M
	ii. SCR	1M
	iii. Signal Conditioning	1M
	iv. Isolator	1M
	v. Resistive Load	1M
2.	**Design of complete circuit on paper**	
	i. Design of Controlled Rectifier Circuit	1M
	ii. Design of Signal Conditioning Circuit	1M
	iii. Design of isolator circuit	1M
	iv. Design related to contents of registers for PWM	1M
	v. Write the proper algorithm	1M
3.	**Programming using LPC2148**	
	i. Selection of proper header file	1M
	ii. Selection of proper registers	1M
	iii. Proper delay for PWM generation	1M
	iv. Proper debugging	1M
	v. Use of logic analyzer	1M
4.	**Simulation of designed circuit**	
	i. Simulation of Controlled Rectifier Circuit	1M
	ii. Simulation of Signal Conditioning Circuit	1M
	iii. Simulation of isolator circuit	1M
	iv. Simulation of Controller output	1M
	v. Simulation of complete circuit	1M
5.	**Result, References used and report writing**	
	i. Signal Conditioning Circuit output	1M
	ii. Interfacing of complete hardware with controller	1M
	iii. Proper references used	1M
	iv. Proper writing of report	1M
	v. Output of complete circuit	1M

7. **Evaluation Sheet**

Gr. No.	Name of Student	A 5M	B 5M	C 5M	D 5M	E 5M	Total Marks Obtained/25M
1	Akash Patil Piyush Patil Rushikesh Sukase Anisha Changle Pratik Pawar	3	4	2	3	3	15
2	Pragati Weljali Pranita Sancheti Bhakti Misal Pranav Deshpande Ashwin Pathak	3	3	3	3	2	14
3	Komal Pagar Surabhi Narkhede Mansi Mohan Dhanashree Pawar Komal More	3	00	2	2	00	07
4	Nimse Amisha Aher Asavari Vazarde Gayatri Patil Saloni	3	2	1	1	2	09
5	Vaishnavi Kharde Sakshi Pagare Sayali Jagtap Pranoti Kasture Pooja Patil	2	2	00	1	1	06
6	Varsha Shinde Iramsaba Shaikh Rutuja Rajole Rutuja Kakulte Deepak Sinha	3	4	1	2	1	11
7	Shubhangi Kankal Minal Amrurtkar Sonali Gupta Vaishnavi Patil Jagruti Chaudhari	3	00	3	2	2	10
8	Tushar Borse Shivam Deore Siddesh Sonar Aakash Gaikwad	2	2	1	2	1	08

	Harshvardhan Wagh						
9	Pushkar Kankriya Srushti Kanhe Mohit Kirve Roshani Pawar	4	00	00	4	2	10
10	Sameeksha Diwan Dipali Avhad Vaishnavi Borse Hitesh Chitte Manasi Kulkarni	3	2	2	3	2	12
11	Poonam Aher Priyanka Budhwant Anushka Aware Meghana Jadhav Swati Gholap Shraddha Pachore	4	4	2	4	3	17
12	Omkar Wadekar Siddhant Deshmukh Sanket Devhanhalli Pritesh Vasani Pranil Chavan	4	3	2	4	3	16
13	Rajole Shivani Rathod Payal	3	2	2	2	3	12
14	Pradip Gavali Shubham Shirvade Siddhant Joshi Nitin Patil Mahesh Chokhande	00	00	00	00	00	00

8. **Impact Analysis**

SN	3- High/Excellent	2 - Moderate /Average	1- Slight/Poor
1. Did you understand and cover the objective of the activity?	**75.57%**	**24.42%**	**-**
2. Do you find that methodology is helpful to cover the content beyond syllabus?	**77.55%**	**22.44%**	**-**
3. Does this helps you for building a good team?	**73.46%**	**26.53%**	**-**

4. Does the content covered are relevant and will be helpful as a life-long learning?	**75.57%**	**24.42%**	**-**
5. Can you want to conduct such activity again?	**97.95%**	**2.04%**	**-**

9. **Activity Picture**

10.**For review and critique contact: e-mail address of faculty and HOD**
pawar.balasaheb@kbtcoe.org, dhumane.shital@kbtcoe.org, hod.etc@kbtcoe.org

Mr. B. J. Pawar Subject In charge	Mr. B. J. Pawar Module Coordinator	Dr. Birari. V.M HoD