**Electronics & Telecommunication Engineering**

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|---|---|
| Academic Year – 2019-20 | Class: TE |
| Semester – II | Date : 03/02/2020 |
| CO: CO1, CO2, CO3.CO4 | 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: Ms. S. A. Dhumane

2. Subject: Advanced Processor

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

   I. Create the awareness of microcontroller selection as per the task ahead

   II. Analyze various microcontrollers

   III. Design and develop embedded C code of PWM generator using LPC2148 microcontroller

   IV. Examine the results of designed electronic circuit using modern tool like Keil4 compiler and simulation software

4. **Topic Covered through Activity**:

   Design of PWM generator of LPC2148 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<br>Piyush Patil<br>Rushikesh Sukase<br>Anisha Changle<br>Pratik Pawar | 3 | 4 | 2 | 3 | 3 | 15 |
| 2 | Pragati Weljali<br>Pranita Sancheti<br>Bhakti Misal<br>Pranav Deshpande<br>Ashwin Pathak | 3 | 3 | 3 | 3 | 2 | 14 |
| 3 | Komal Pagar<br>Surabhi Narkhede<br>Mansi Mohan<br>Dhanashree Pawar<br>Komal More | 3 | 00 | 2 | 2 | 00 | 07 |
| 4 | Nimse Amisha<br>Aher Asavari<br>Vazarde Gayatri<br>Patil Saloni | 3 | 2 | 1 | 1 | 2 | 09 |
| 5 | Vaishnavi Kharde<br>Sakshi Pagare<br>Sayali Jagtap<br>Pranoti Kasture<br>Pooja Patil | 2 | 2 | 00 | 1 | 1 | 06 |
| 6 | Varsha Shinde<br>Iramsaba Shaikh<br>Rutuja Rajole<br>Rutuja Kakulte<br>Deepak Sinha | 3 | 4 | 1 | 2 | 1 | 11 |
| 7 | Shubhangi Kankal<br>Minal Amrurtkar<br>Sonali Gupta<br>Vaishnavi Patil<br>Jagruti Chaudhari | 3 | 00 | 3 | 2 | 2 | 10 |
| 8 | Tushar Borse<br>Shivam Deore<br>Siddesh Sonar<br>Aakash Gaikwad | 2 | 2 | 1 | 2 | 1 | 08 |

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

**Attendance:**

MARATHA VIDYA PRASARAK SAMAJ'S
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NAAC
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& Approved by AICTE New Delhi Vide Letter No: 740-89-32 (E) ET/98
AISHE Code - C-41622

# Innovative Teaching_Learning Method for Power Electronics with Advanced Processor

## Group Members

A. Selection of proper components .....5M
B. On paper design of hardware.....5M
C. Programming using LPC2148.....5M
D. Simulation of designed circuit.....5M
E. Result, References used and report writing .....5M

| Gr. No. | Name of Student | A 5M | B 5M | C 5M | D 5M | E 5M | Marks Obtained /25M | Sign |
|---|---|---|---|---|---|---|---|---|
| | Akash Patil | | | | | | | |
| | Piyush Patil | | | | | | | |
| 1 | Rushikesh Sukase | 03 | 04 | 02 | 03 | 03 | 15 | |
| | Anisha Changle | | | | | | | |
| | Pratik Pawar | | | | | | | |
| | Pragati Weljali | | | | | | | |
| | Pranita Sancheti | | | | | | | |
| 2 | Bhakti Misal | 03 | 03 | 03 | 03 | 02 | 14 | |
| | Pranav Deshpande | | | | | | | |
| | Ashwin Pathak | | | | | | | |
| | Komal Pagar | | | | | | | |
| | Surabhi Narkhede | | | | | | | |
| 3 | Mansi Mohan | 03 | 00 | 02 | 02 | 00 | 07 | |
| | Dhanashree Pawar | | | | | | | AB |
| | Komal More | | | | | | | |
| | Nimse Amisha | | | | | | | |
| | Aher Asavari | | | | | | | |
| 4 | Vazarde Gayatri | 03 | 02 | 01 | 01 | 02 | 09 | |
| | Patil Saloni | | | | | | | |
| | Vaishnavi Kharde | | | | | | | |
| | Sakshi Pagare | | | | | | | |
| 5 | Sayali Jagtap | 02 | 02 | 00 | 01 | 01 | 06 | |
| | Pranoti Kasture | | | | | | | |
| | Pooja Patil | | | | | | | |
| | Varsha Shinde | | | | | | | |
| | Iramsaba Shaikh | | | | | | | AB |
| 6 | Rutuja Rajole | 03 | 04 | 01 | 02 | 01 | 11 | |
| | Rutuja Kakulte | | | | | | | |
| | Deepak Sinha | | | | | | | AB |

| Gr. No. | Name of Student | A 5M | B 5M | C 5M | D 5M | E 5M | Total Marks Obtained /25M | Sign |
|---|---|---|---|---|---|---|---|---|
| 7 | Shubhangi Kankal | | | | | | | |
| | Minal Amrurtkar | | | | | | | |
| | Sonali Gupta | 03 | 00 | 03 | 02 | 02 | 10 | |
| | Vaishnavi Patil | | | | | | | AB |
| | Jagruti Chaudhari | | | | | | | |
| 8 | Tushar Borse | | | | | | | |
| | Shivam Deore | | | | | | | |
| | Siddesh Sonar | 02 | 02 | 01 | 02 | 01 | 08 | |
| | Aakash Gaikwad | | | | | | | |
| | Harshvardhan Wagh | | | | | | | |
| 9 | Pushkar Kankriya | | | | | | | |
| | Srushti Kanhe | 04 | 00 | 00 | 04 | 02 | 10 | |
| | Mohit Kirve | | | | | | | |
| | Roshani Pawar | | | | | | | |
| 10 | Sameeksha Diwan | | | | | | | |
| | Dipali Avhad | | | | | | | AB |
| | Vaishnavi Borse | 03 | 02 | 02 | 03 | 02 | 12 | |
| | Hitesh Chitte | | | | | | | |
| | Manasi Kulkarni | | | | | | | |
| 11 | Poonam Aher | | | | | | | |
| | Priyanka Budhwant | | | | | | | |
| | Anushka Aware | 04 | 04 | 02 | 04 | 03 | 17 | |
| | Meghana Jadhav | | | | | | | |
| | Swati Gholap | | | | | | | |
| | Shraddha Pachore | | | | | | | |
| 12 | Omkar Wadekar | | | | | | | |
| | Siddhant Deshmukh | | | | | | | |
| | Sanket Devhanhalli | 04 | 03 | 02 | 04 | 03 | 16 | |
| | Pritesh Vasani | | | | | | | |
| | Pranil Chavan | | | | | | | |
| 13 | Rajole Shivani | 03 | 02 | 02 | 02 | 03 | 12 | |
| | Rathod Payal | | | | | | | |
| 14 | Pradip Gavali | | | | | | | |
| | Shubham Shirvade | | | | | | | |
| | Siddhant Joshi | | | | | | | |
| | Nitin Patil | | | | | | | |
| | Mahesh Chokhande | | | | | | | |

Mr. B. J. Pawar
PE Subject Teacher

Ms. S. A. Dhumane
AP Subject Teacher

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**

| | | |
|---|---|---|
| Ms. S. A. Dhumane | Ms. S. A. Dhumane | Dr. Birari. V.M |
| Subject In charge | Module Coordinator | HoD |