



GOVERNMENT OF TAMILNADU

DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI-25

STATE PROJECT COORDINATION UNIT

*(Established under Canada India Institutional Cooperation Project)*

CURRICULUM

| Course Name                  | CIRCUIT SIMULATION USING PROTEUS                                                                                                                                                                                                                                                                                  |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Course Code                  | EC/2020/016                                                                                                                                                                                                                                                                                                       |
| Course Duration              | 40 Hours                                                                                                                                                                                                                                                                                                          |
| Minimum Eligibility Criteria | 10 <sup>th</sup> /+2 /ITI/Diploma/Graduate                                                                                                                                                                                                                                                                        |
| Pre-requisites (if any)      | -                                                                                                                                                                                                                                                                                                                 |
|                              |                                                                                                                                                                                                                                                                                                                   |
| Course Objectives            | Training module has been designed for the participants to <ul style="list-style-type: none"> <li>• Study the Concept of PCB Design using PROTEUS</li> <li>• Practice on Simulation of Digital and Analog Circuit in PROTEUS Environment</li> <li>• Develop Electronic Circuit and Analyse the response</li> </ul> |
|                              |                                                                                                                                                                                                                                                                                                                   |
| Course Outcomes              | At the end of training, the trainees will be able to <ul style="list-style-type: none"> <li>• Simulate Digital and Analog Electronics Circuit in PROTEUS</li> <li>• Analyse the response of Electronic Circuits</li> <li>• Generate file for Fabrication of PCB</li> </ul>                                        |
|                              |                                                                                                                                                                                                                                                                                                                   |
| Expected Job Roles           | PCB Designer                                                                                                                                                                                                                                                                                                      |

| TEACHING AND SCHEME OF EXAMINATION |                                  |           |    |                  |     |                         |
|------------------------------------|----------------------------------|-----------|----|------------------|-----|-------------------------|
| Course Code                        | Course Name                      | Hours     |    | Assessment Marks |     | Duration of Examination |
|                                    |                                  |           |    | Min              | Max |                         |
| EC/2020/016                        | CIRCUIT SIMULATION USING PROTEUS | Theory    | 16 | 10               | 20  | 3 Hours                 |
|                                    |                                  | Practical | 24 | 40               | 80  |                         |
|                                    |                                  | Total     | 40 | 50               | 100 |                         |

**DETAILED SYLLABUS**

| Unit No                        | Modules                                                                                                 | No.of.Hours |           |
|--------------------------------|---------------------------------------------------------------------------------------------------------|-------------|-----------|
|                                |                                                                                                         | Theory      | Practical |
| I                              | INTRODUCTION TO PROTEUS                                                                                 | 10 Hours    |           |
| 1.1                            | Introduction to software and installation                                                               | 06          | 04        |
| 1.2                            | Proteus Environment, Start up screen, Toolbars, Pop-up Menus                                            |             |           |
| 1.3                            | Open/Crate new design – Component selection from Libraries - Placing components                         |             |           |
| 1.4                            | Components rotation and Making connection, Changing components values, Labelling, Measuring Instruments |             |           |
| 1.5                            | Grounding and Simulation of Rectifier Circuit                                                           |             |           |
| II                             | CIRCUIT SIMULATION                                                                                      | 20 Hours    |           |
| 2.1                            | LED ON/OFF connection using Proteus, LED series connection/Parallel connection                          | 06          | 14        |
| 2.2                            | LDR sensor using Proteus - Water level indicator                                                        |             |           |
| 2.3                            | Logic Gate using Transistor and Diode, Half Adder Circuit                                               |             |           |
| 2.4                            | Automatic Streetlight control using LDR and PIC - LED Flasher circuit using 555 timer IC                |             |           |
| 2.5                            | Interfacing LCD with PIC Microcontroller - Dancing LED circuit - Automatic door open close Alarm        |             |           |
| 2.6                            | 12V DC to 24V DC Converter using Proteus simulator.                                                     |             |           |
| III                            | PCB DESIGN                                                                                              | 10 Hours    |           |
| 3.1                            | Transferring the design for PCB layout                                                                  | 04          | 06        |
| 3.2                            | Board outline selection, Part placement                                                                 |             |           |
| 3.3                            | Layer management                                                                                        |             |           |
| 3.4                            | PCB file generation                                                                                     |             |           |
| 3.5                            | Procedure for single sided PCB                                                                          |             |           |
| Total Theory / Practical Hours |                                                                                                         | 16          | 24        |
| Total hours                    |                                                                                                         | 40          |           |

## HARDWARE REQUIREMENT

| S.NO | LIST OF TOOLS /EQUIPMENTS |
|------|---------------------------|
| 1    | PC/Laptop                 |

## SOFTWARE REQUIREMENT

| S.NO | NAME OF THE SOFTWARE |
|------|----------------------|
| 1    | PROTEUS Software     |

## REFERENCE BOOKS

| S.NO | NAME OF THE BOOK                                   | AUTHOR                                                           | PUBLISHER      |
|------|----------------------------------------------------|------------------------------------------------------------------|----------------|
| 1    | Instrumentation, Measurement, Circuits and Systems | Tianbiao Zhang                                                   | Springer       |
| 2    | Proteus (Design Software)                          | Lambert M. Surhone,<br>Miriam T. Timpledon,<br>Susan F. Marseken | VDM Publishing |

## ASSESSMENT AND CERTIFICATION

| S.No | Criteria for assessment                                                                                                                                                                                                                                    |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.   | A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the CIICP Project Polytechnic College for a duration of 3 hours                                                                    |
| 2.   | A trainee must have 75% of attendance to appear for End examination in Theory and Practical.                                                                                                                                                               |
| 3.   | The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)                                                                                               |
| 4.   | The assessment for practical part will be based on the marks scored in the end examination conducted by the CIICP Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic. |
| 5.   | The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.                                                                                                                 |
| 6.   | On successful completion of training, certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.                                                                                           |

## END EXAMINATION

### ALLOCATION OF MARKS

| S.NO               | Description                             | Max. Marks |
|--------------------|-----------------------------------------|------------|
| 1.                 | Theory Examination                      | 20         |
| 2.                 | Practical Examination                   |            |
|                    | a)Objective and Simulation Circuit      | 20         |
|                    | b)Procedure and Connections / Execution | 20         |
|                    | c)Result and Viva                       | 20         |
|                    | d)Record                                | 20         |
| <b>Total Marks</b> |                                         | <b>100</b> |

## **THEORY MODEL QUESTION PAPER**

### **EC/2020/016 - CIRCUIT SIMULATION USING PROTEUS**

**(Maximum Marks: 20)**

**(N.B: Answer any Twenty questions)**

**20x1= 20 Marks**

1. What is Proteus software?
2. What is simulation?
3. List the Simulation software used in circuit simulation.
4. Which company is invented the Proteus software?
5. What is the dimension output of Proteus software?
6. Which menu is used to convert PCB layout?
7. Expand ISIS.
8. What are the features of ISIS in Proteus software?
9. How to increase workspace in Proteus?
10. What is Proteus 8 used for?
11. What is Proteus ISIS software?
12. What is latest version of Proteus?
13. Give some example for electronic simulation software
14. What is a breadboard used for?
15. What is a circuit simulator?
16. What is circuit level simulator?
17. What is the Advantages of Simulation?
18. What is the disadvantage of Simulation?
19. What is Continuous Simulation?
20. What is Discrete-event Simulation?
21. What Is The Need For Simulation?
22. What Are Logical Level Simulators?
23. What are the product modules in Proteus software?
24. What is the feature of Proteus 8.13?
25. Expand VSM in Proteus