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 ORCAD** |
|---|---|
| Course Code | **EC/2020/017** |
| Course Duration | 40 Hours |
| Minimum Eligibility Criteria | 10th/+2 /ITI/Diploma/Graduate |
| Pre-requisites (if any) | - |
| | |
| Course Objectives | Training module has been designed for the participants to<br>• Practice on Simulation of Digital and Analog Circuit using ORCAD<br>• Develop Electronic Circuit and Analyse the response<br>• Learn the Concept of DC and AC Sweep Analysis |
| | |
| Course Outcomes | At the end of training, the trainees will be able to<br>• Simulate Digital and Analog Electronics Circuit in ORCAD<br>• Analyse the response of Electronic Circuits<br>• Generate the response of Electronic circuit in ORCAD |
| | |
| Expected Job Roles | ORCAD Circuit Designer |

**TEACHING AND SCHEME OF EXAMINATION**

| Course Code | Course Name | Hours | | Assessment Marks | | Duration of Examination |
|---|---|---|---|---|---|---|
| | | | | Min | Max | |
| EC/2020/017 | CIRCUIT SIMULATION USING ORCAD | Theory | 16 | 10 | 20 | 3 Hours |
| | | Practical | 24 | 40 | 80 | |
| | | Total | 40 | 50 | 100 | |

**EC/2020/017 – CIRCUIT SIMULATION USING ORCAD**

**DETAILED SYLLABUS**

| Unit No | Modules | No.of.Hours | |
|---|---|---|---|
| | | Theory | Practical |
| **I** | **OrCAD Capture** | **10 Hours** | |
| 1.1 | New Design Templates | 06 | 04 |
| 1.2 | Working with multisheet projects, Placing parts | | |
| 1.3 | Working with hierarchy projects, Intertool communication | | |
| 1.4 | New library creation, Component information system (CIS) | | |
| 1.5 | New part creation | | |
| **II** | **OrCAD – PSpice** | 20 Hours | |
| 2.1 | P-Spice netlist creation | 07 | 13 |
| 2.2 | Single, multi & Split windows | | |
| 2.3 | DRC markers | | |
| 2.4 | Stimulus editor | | |
| 2.5 | Controlling background and foreground colours | | |
| 2.6 | Bias point analysis, Customizing Trace colour sequence | | |
| **III** | **Sweep Analysis** | 10 Hours | |
| 3.1 | Copying cursor information | 03 | 07 |
| 3.2 | DC Sweep analysis | | |
| 3.3 | Exporting Trace data | | |
| 3.4 | Parametric analysis | | |
| 3.5 | Temperature analysis | | |
| | **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 | ORCAD Software |

## REFERENCE BOOKS

| S.NO | NAME OF THE BOOK | AUTHOR | PUBLISHER |
|---|---|---|---|
| 1 | Analog Design and Simulation Using OrCAD Capture and PSpice | Dennis Fitzpatrick | Newness |
| 2 | Introduction to PSpice Using OrCAD for Circuits and Electronics | M. H. Rashid | Pearson/Prentice Hall |

## 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 | 20 |
| | b)Procedure and Connections / Execution | 20 |
| | c)Result and Viva | 20 |
| | d)Record | 20 |
| | **Total Marks** | **100** |

**THEORY MODEL QUESTION PAPER**

**EC/2020/017 – CIRCUIT SIMULATION USING ORCAD**

**(Maximum Marks: 20)**

**(N.B: Answer any Twenty questions)** **20x1= 20 Marks**

1. What is OrCADPspice.
2. Expand Pspice.
3. Expand Orcad.
4. Who is developed in OrCADPspice?
5. What is a circuit simulator?
6. What is a breadboard used for?
7. How do you convert information from a schematic to a PCB?
8. What is OrCAD layout?
9. Why OrCAD used?
10. What is the latest version of OrCADPspice?
11. What are the features of OrCAD 17.2?
12. What is the Key flex and rigid flex features?
13. What is the function of Padstack?
14. List Some Open Source Circuit Simulator Software.
15. What is circuit level simulator?
16. What is the Advantages of Simulation?
17. What is the disadvantage of Simulation?
18. What is Continuous Simulation?
19. What is Discrete-event Simulation?
20. What Is The Need For Simulation?
21. What Are Logical Level Simulators?
22. What is a circuit schematic diagram?
23. What are schematic symbols?
24. What is DC Sweep?
25. What is AC Sweep?