**GOVERNMENT OF TAMILNADU**

**DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI**

**STATE PROJECT COORDINATION UNIT**

**(Established under Canada India Institutional Cooperation Project)**

**CURRICULUM**

| Course Name | **PARAMETRIC DESIGN USING PTC CREO (PRO-E)** |
|---|---|
| Course Code | ME/2020/033 |
| Course Duration | 60 Hours |
| Minimum Eligibility Criteria | ITI/10th/+2/Diploma/Graduates |
| Pre-requisites (if any) | - |
| | |
| Course Objectives | Training module has been designed to provide the participants to<br>• Ensure the basics of 3D Model creation for design, visualization, analysis, animation and prototype used in manufacturing industries.<br>• Design the product as if it were in the real world of manufacturing |
| | |
| Course Outcomes | At the end of training, the trainees will be able to<br>• Identify and apply the concepts for creating 3D models used for manufacturing the real-time components and other industrial application.<br>• Develop 3D models, 2D drawings, assembly models and assembly drawings with automatic BOM using PTC Creo software with manufacturing standards in an industry. |
| | |
| Expected Job Roles | Design and Modelling Engineer |

| **TEACHING AND SCHEME OF EXAMINATION** | | | | | | |
|---|---|---|---|---|---|---|
| Course Code | Course Name | Hours | | Assessment Marks | | Duration of the Examination |
| | | | | Min | Max | |
| ME/2020/033 | **PARAMETRIC DESIGN USING PTC CREO (PRO-E)** | Theory | 20 | 10 | 20 | 3 Hours |
| | | Practical | 40 | 40 | 80 | |
| | | Total | 60 | 50 | 100 | |

**ME/2020/033- PARAMETRICDESIGN USING PTC CREO (PRO-E)**

DETAILED SYLLABUS

| Unit No. | Modules | No. of Hours | |
|---|---|---|---|
| | | Theory | Practical |
| **I** | **Introduction to CAD/CAM and PTC Creo** | **4 Hours** | |
| 1.1 | PTC Creo Fundamentals | 02 | |
| 1.2 | Introduction to CAD/CAMB-Rep and CSG Techniques – Working Features | | |
| 1.3 | Primitive Base Features. | | |
| 1.4 | **Practical:**<br>➢ Base features practice for the given drawing | | 02 |
| **II** | **Pro/E Sketching Fundamentals** | **10 Hours** | |
| 2.1 | Creation of sketches – Entity creation and modification | 03 | |
| 2.2 | Development of 2D Parametric sketches using dimensions and constraints. | | |
| 2.3 | **Practical:**<br>➢ Sketching of Base Features to create part models for the given drawing | | 07 |
| **III** | **Creation of 3D Models & Creation of Datum Features** | **10 Hours** | |
| 3.1 | Extruding Features and Revolving Features | 03 | |
| 3.2 | Sweep and Blend | | |
| 3.3 | Creation of Datum Planes, Axis, Points and Curves. | | |
| 3.4 | **Practical:**<br>➢ Creating Extrude, Revolve sweep, blend and Datum creating exercise for the given drawing | | 07 |
| **IV** | **Creation of Engineering Features & Constructional Features** | **6 Hours** | |
| 4.1 | Holes – Linear, Axial, Radial holes | 02 | |
| 4.2 | Ribs & Shell | | |
| 4.3 | Fillet and Chamfer | | |
| 4.4 | Pipe and Cosmetic Features. | | |
| 4.5 | **Practical:**<br>➢ Creating Hole, ribs, Shell, etc., for the given drawings | | 04 |
| **V** | **Modification of Features** | **10 Hours** | |
| 5.1 | Copy, Paste, Mirror & Move | 03 | |
| 5.2 | Pattern – Identical, Varying and General | | |
| 5.3 | Edit, Edit Definition, Reorder, Reroute | | |
| 5.4 | Sketch and Feature editing | | |

| | | | |
|---|---|---|---|
| 5.5 | **Practical:**<br>➢ Feature editing Exercise for the given part models | | 07 |
| **VI** | **Creation of Sections and File Export / Import** | **10 Hours** | |
| 6.1 | View Manager - Sectional views, Color and Appearance | 04 | |
| 6.2 | Creation of STL, IGES, STEP and JPEG models. | | |
| 6.3 | **Practical:**<br>➢ Creating Sectional views and converting the model files | | 06 |
| **VII** | **Introduction to Assembly modeling and Automated drafting.** | **10 Hours** | |
| 7.1 | Creation of Assembly models – Mate – Align – Fix – etc. | 03 | |
| 7.2 | Creation of Assembly models and 2D drawing creation. | | |
| 7.3 | **Practical:**<br>➢ Assembling and drafting the component for the part models | | 07 |
| | **Total Theory and Practical hours** | **20** | **40** |
| | **Total hours** | **60** | |

**HARDWARE REQUIREMENTS**

| Sl. No | LIST OF TOOLS /EQUIPMENTS |
|---|---|
| 1 | High End Workstation (with Intel Processor i5 or i7) with 1 TB HDD / 16 GB DDR4 RAM / 2GB PCI Graphics Card / KBD / Mouse |
| 2 | LCD / LED Monitor - 22” Wide |
| 3 | Microsoft Operating system (Windows 8 / 10 - 64 Bit Support) |

**SOFTWARE REQUIREMENT**

| S. No. | LIST OF TOOLS /EQUIPMENTS |
|---|---|
| 1 | PTC Creo 6.0 (Educational or Commercial License )(Educational or Commercial License) |

**REFERENCE BOOKS**

| S. No. | Name of the Book | Author | Publisher & Year |
|---|---|---|---|
| 1 | PTC Creo Parametric 6.0 for Designers - 3rd Edition | Sham Tickoo | CADCIM Technologies, 2015 |
| 2 | Parametric Design using PTC Creo - User Manuals | PTC | Parametric Technology Corporation, USA, 2016 |

**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 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 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)Aim and Procedure | 20 |
| | b)Demonstration / Execution | 25 |
| | c) Result & Viva Voce | 15 |
| | d)Record | 20 |
| | **Total Marks** | **100** |

**THEORY MODEL QUESTION PAPER**

ME/2020/033 - PARAMETRIC DESIGN USING PTC CREO 3.0(PRO-E)

(Maximum Marks: 20)

Answer any **Twenty** questions: **20x1=20 Marks**

1. Abbreviation of 'mmns_part_solid ' in creo software is _____
2. What is the default unit in creo parametric software?
3. What is the Standard orientation shortcut key?
4. What is the purpose of 'View manager'?
5. Uses of Datum display icon is_____
6. Reorientation is used to change default orientation? ( Yes or No)
7. Uses of 'Palette' in creo software is _____
8. What the difference is between extrude and revolve?
9. How to create sweep geometry creo software?
10. How to create a geometrical pattern?
11. What is the use of reference line?
12. What are the uses of 'General view' option?
13. What file type does Creo use?
14. How to edit a drawing sheet in Creo?
15. How to edit a object name in Creo?
16. How to input material name in creo?
17. List the difference between planer section and offset section.
18. How to create automatic bill of materials?
19. State the need for additional datum plane in cero.
20. How to create blend?
21. What is the need for format sheet creo software?
22. Why center line is important for revolve?
23. Is symmetric option can be used in all kind of model? State the reasons.
24. How to use 'corner' command in sketch view?
25. Render command is used for _____