

**II Year I Semester**

**Code: 20ME3201**

**L T P C**

**1 0 2 2**

**PRODUCT DEVELOPMENT LAB-I**

**Course objectives:**

1. To develop Machine & Engine components in 3D modeling with the help of numerical design calculations, standards and nomenclature.
2. To make part drawings including sectional views for various machine elements.
3. To understand the basic principles of different types of machine components.

**Note: The software used for the laboratory is Fusion 360**

**Module: 1**

**Design of Machine Components**

1. Popular forms of Screw threads, bolts, nuts, stud bolts-
2. Type of different Riveted joints for plates- Single riveted lap joint, double riveted chain lap joint, double riveted zig-zag lap, strap, chain butt joints.
3. Gear Wheels -Bevel Gear, Spur Gear, Helical Gear, worm gear.
4. Flange's- weld neck flange, slip on flange, blind flange, socket weld flange, threaded flange and lap joint flange
5. Springs - Helical Spring, conical springs, Leaf springs
6. Bearings- Ball bearing, roller bearing

**Module: 2**

**Design of Engine Components**

1. Piston- piston head, skirt, and barrel
2. Fly Wheel
3. Connecting Rod
4. Crank Shaft

**Software download link for Students/Faculty:**

- <https://www.autodesk.in/campaigns/education/fusion-360>

Fusion360 online tutorial links:

- <https://youtu.be/mK60ROb2RKI>
- <https://www.solidprofessor.com/tutorials/fusion-360>
- [https://warwick.ac.uk/fac/sci/wmg/about/outreach/resources/fusion\\_tutorials/](https://warwick.ac.uk/fac/sci/wmg/about/outreach/resources/fusion_tutorials/)

**Course Outcomes:**

By the end of the course:

- CO1 The student will have good knowledge on using the software Fusion360.
- CO2 The student will be able to prepare different machine component drawings easily.
- CO3 The student will be able to prepare different engine component drawings easily.
- CO4 The student will have an overall view of working with various machine and engine components on a 3D Platform.