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## Department of Mechanical Engineering

### Theory of Machines (67310)

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|---|---|
| **Total Credits** | **3** |

**major compulsory**

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|---|---|
| **Prerequisites** | P1 : Dynamics (61211) OR Dynamics (67210) OR Dynamics (67221) |

**Course Contents**

Kinematic analysis of mechanisms. Velocity and acceleration polygons. Static and inertia force analysis of machinery. Dynamic analysis of cams, and flywheels. Balancing of machines.

| | Intended Learning Outcomes (ILO's) | Student Outcomes (SO's) | Contribution |
|---|---|---|---|
| 1 | Ability to recognize important mechanisms and some important concepts about them such as degrees of freedom, stroke, dead points, toggle angle .etc. | A | 20 % |
| 2 | Identify different methods for solving kinematics and kinetics problems for mechanism (velocities, accelerations and torques) | E | 35 % |
| 3 | Design machine elements, within theory of machines context, such as cam shape and follower prescribed motion, machine balancing, and flywheels | C | 45 % |

**Textbook and/ or Refrences**

1. Theory of Machines, 2nd Ed., 2005. SS Rattan. 2. Design of Machinery, 3rd Ed., 2004. R. L. Norton. 3. Theory of Machines and Mechanisms, 3rd Ed. Uicker and Shigley

| Assessment Criteria | Percent (%) |
|---|---|
| First Exam | 20 % |
| Second Exam | 20 % |
| Quizzes | 15 % |
| Final Exam | 45 % |

**Course Plan**

| Week | Topic |
|---|---|
| 1, 2, &3 | Introduction to Mechanisms and Position Analysis. |
| 4, 5, &6 | Cam design |
| 7 | First Exam |
| 7 &8 | Velocity analysis |
| 9 &10 &11 | Acceleration analysis |
| 12 | Second Exam |
| 12 &13 | Force analysis |
| 14 &15 | Balancing of a Machine |
| 15 &16 | Flywheels |
| 16 | Final Exam |