

Machine Design

Instructor:

Marco Evangelos Biancolini

Course Format:

6 Hours weekly: 4 for lectures 2 for design projects. The classroom is divided in design teams. Each team is in charge for deliverables of assigned projects.

Spring Semester (3rd year, 2nd semester of Engineering Science)

Language:

English

Recommended Previous Knowledge:

Mechanics of Materials and Structures, Kinematics and Dynamics of Mechanisms

Contents:

The first part of the course is addressed to the consolidation of basic knowledge to put the student in the right conditions to face a generic machine design problem: Mechanical Engineering design in Broad, Perspective, Load Analysis, Materials, Static Body Stresses, Elastic strain, Deflection, Stability (Eulerian buckling), Vibrations (beam eigenmodes), Failure Theories, Safety Factors, Reliability, High cycles Fatigue, Low cycles Fatigue, Surface Damage, Contact problems.

The second part will cover specific design activities: Threaded Fasteners and Power Screws, Rivets, Welding, Bonding, Springs, Lubrication and Sliding Bearings, Rolling-Element Bearings, Spur Gears, Shafts and Associated Parts.

During the course several design activities will be demonstrated by exercises and by real life applications.

Learning Outcomes:

The aim of the course is to provide a basic general knowledge about machine design methods completed with design guidelines for specific components. Technical skills will be consolidated thanks to the ongoing design activities conducted by students teams.

Reading Resources:

Reference book: Machine Component Design, 5th Edition International Student Version Robert C. Juvinall - (University of Michigan), Kurt M. Marshek (University of Texas at Austin)

Performance Record:

Review of teams projects. Final exam: written problem and oral test.

Workload:

9 ECTS.

Further Information:

<http://www.torvergata-karting.it/>

<http://www.engineering-sciences.uniroma2.it/>

Contact:

biancolini@ing.uniroma2.it