

Machine Design

Instructor:

Luciano Cantone

Course Format:

6 Hours weekly: 4 for lectures 2 for exercises.

Intermediate and final written verification, before nominal examination period.

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 Eigen-modes), Failure Theories, Safety Factors, Reliability, High cycles Fatigue, Low cycles Fatigue, Surface Damage, Contact and impact 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 and Helical 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.

Reading Resources:

Reference book: Fundamentals of Machine Component Design, Global Edition, Wiley, Robert C. Juvinall, Kurt M. Marshek.

Performance Record:

Final exam: written problem and oral test. Written part is not necessary in case of positive written intermediate verification.

Workload:

9 ECTS.

Contact:

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