

## MACHINE DESIGN II

**Instructor:** Fazıl Önder Sönmez  
**Class hours:** Mondays 15.00–17.00 (M 3120); Wednesdays 15.00–17.00 (M 2230)  
**Office hours:** Mondays 13.00–15.00, Wednesdays 13.00–15.00, or drop by  
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**Assistant:** Mehmet Utku Demir, E-mail: [utku.demir@boun.edu.tr](mailto:utku.demir@boun.edu.tr)  
**Prerequisite:** ME 324; Machine Design I

**Prerequisites by Topic:** Statics and free body diagrams, material science, mechanics of materials, stress analysis, deflection analysis, reliability analysis, static failure theories, fatigue-failure theories.

**Catalog Description:** Analysis and design of machine elements such as power screws and threaded fasteners; joining components such as rivets and welds; springs; various types of gears such as spur, helical, bevel, and worm; clutches, brakes, belts and chains

**Course Objectives:** Applying scientific principles and concepts to the design of basic mechanical components and systems; improving problem solving and decision making abilities; obtaining design solutions to open-ended problems through a systematic design process

**Contribution of the course to the program outcomes:** 1) Knowledge of linear algebra, depth in physics, advanced calculus, differential equations, and engineering sciences along with the ability to apply these towards solutions of elementary mechanical engineering problems; 2) Ability to formulate and solve open-ended problems. 3) Ability to design mechanical and thermal systems, components, or processes to meet desired needs by combining course work and independent study. 5) Ability to use modern computer tools in mechanical engineering 6) Ability to function professionally and with ethical responsibility as an individual and on multidisciplinary teams. 7) Ability to communicate in written, oral, and graphical forms.

**Contribution of the course to meeting the professional component:** This course builds on engineering sciences to provide the students with fundamental knowledge of machine elements used in design, and thus contributes to mechanical design practice. Design considerations acting as realistic constraints are also given such as cost, safety, reliability, environment, manufacturability, aesthetics, noise, and ethics.

**Computer use:** 100% of the project assignments

**Textbook:** Fundamentals of Machine Component Design, Juvinall R.C., Marshek K., Fifth edition, John Wiley & Sons, 2012.

**Grading:**

Projects	30 %	Projects are due on the date indicated.
Midterm	30 %	
Final Exam	40 %	
Attendance	± 2 %	

**Notes:** Exams are closed book. A formula sheet will be provided.

### Tentative Course Schedule:

<u>Week</u>	<u>Topics</u>
1-5	Spur gears
6	Helical gears, bevel gears, worm gears <b>Project 1</b> <b>Midterm</b>
7-9	Threaded fasteners, power screws, rivets <b>Project 2</b>
10-12	Springs <b>Project 3</b>
12-14	Clutches and brakes
14	Belts and chains <b>Final Exam</b>