



AMIRKABIR

University of Technology

## Statics Spring 2018

### **COURSE DESCRIPTION:**

Mechanics is a branch of the physical sciences that is concerned with the state of rest or motion of bodies that are subjected to the action of forces. In general, this subject can be subdivided into three branches: rigid-body mechanics, deformable-body mechanics, and fluid mechanics. In this course we will study rigid-body mechanics since it is a basic requirement for the study of the mechanics of deformable bodies and the mechanics of fluids. Furthermore, rigid-body mechanics is essential for the design and analysis of many types of structural members, mechanical components, or electrical devices encountered in engineering. Rigid-body mechanics is divided into two areas: statics and dynamics.

Statics deals with the equilibrium of bodies, that is, those that are either at rest or move with a constant velocity; whereas dynamics is concerned with the accelerated motion of bodies. We can consider statics as a special case of dynamics, in which the acceleration is zero; however, statics deserves separate treatment in engineering education since many objects are designed with the intention that they remain in equilibrium.

### **COURSE STAFF:**

Instructor: Dr. Siamak Epackachi

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### **CLASS SCHEDULE:**

Lecture: Saturday 10:45-12:15 / Monday 10:45-12:15

Recitation: Will be scheduled at the first week of classes

### **REFERENCES:**

*Engineering Mechanics-Statics 6th Edition by James L. Meriam and, L. G. Kraige*

*Engineering Mechanics: Statics (14th Edition) by Russell C. Hibbeler*

### **GRADING:**

Assignments	20%
Quizzes	10%
Midterm	25%
Final	45%



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- Attendance at all lectures and recitations, and active participation is expected. The instructor regularly brings up questions and discussions during lecture time. Students are encouraged to volunteer in answering questions and participate in discussions.
- *Sustained effort starting today*: Come to class and recitations regularly. Pay attention in class without distractions through smartphones etc. Bring a scientific calculator and follow along with calculations in class.
- For the assignments, although students may consult with classmates, it is expected that solutions that are submitted, reflect the individual work of students.
- Every week, problem(s) will be assigned during the recitation. You must attempt to solve the problem(s). During recitation, the instructor will show in detail how to solve the problem(s), and help you reach the correct answer. The problem(s) will be collected at the end of recitation for extra credit. You will get 5 bonus points towards your HW grade for solving problems during each recitations. Attendance is not mandatory but it is strongly recommended as it will help you succeed in the course.
- A significant part of engineering is written communication of laboratory work and analysis/design proposals. Heavy emphasis will be placed on clarity, organization and readability of your work. (a) All assignments must be submitted with no more than one problem per page. (b) Write your name, course and homework number on a cover sheet. (c) Staple pages together. (d) A clear and well-labeled **drawing** or **free body diagram** as appropriate *must* be presented with every problem. (e) Always use **units** everywhere in your work – a number without units makes no sense in engineering. (f) Show each step of the problem and clearly explain the logic being used. (g) Clearly box all final answers.

## Course Outlines:

- Introduction
- Force systems
- Equilibrium
- Structures
- Distributed forces + Appendixes A&B
- Friction
- Virtual Work (tentative)