

Semester Spring 2021

Course Number ENGR 0135
Course Title Statics and Engineering Mechanics 1

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Office Hours Tuesday 1:00-5:00PM
Thursday 1:00-5:00PM

Lecture Time/Room Thursday 8:15-11:00AM
Zone 3-104

Prerequisites MATH 0230 Analytic Geometry & Calculus 2
PHYS 0174 Basic Physics for Science & Engr. 1

Textbook W. F. Riley, L. D. Sturges, and D. H. Morris: Statics and Mechanics of Materials: An Integrated Approach. 2nd Edition. John Wiley & Sons, Inc.

Course Description This course is a 3 credit hour class. It provides an introduction to the mechanics of materials and structures by covering two major subjects in Mechanical Engineering: Statics and Mechanics of Materials. For statics, the course will discuss about forces in plane and space, equilibrium of particles and equilibrium of rigid body and analysis of structure for truss problem. For Mechanics of Materials, the concept of stress, the axial load, torsion load, bending load and combine load will be covered. Finally, the mechanical design of a system will also be discussed to help students to develop the logical thinking in handling the real problem in mechanics.

Course Outcome It is expected that the students will learn to develop an understanding of static equilibrium and stresses in statically-determinate structures and how to apply them to engineering systems; learn a systematic approach to problem solving; and foster effective mathematical and graphical communication skills.
While there will be a chance for students to apply their mathematical skills in this subject, the emphasis is on the physical understanding of why a material or structure behaves the way it does in the engineering design.

Class Calendar

Session	Class Date	Chapter	Topic	Assignment
1	Mar 11	Syllabus Ch. 01	Introduction, Basic Concepts, Newton's Law Units, Dimensions , Significant Figures	HW01
2	Mar 18	Ch. 02	Review Vector/Dot Product Concurrent Force Systems	HW02
3	Mar 25	Ch. 03	Equilibrium of Concurrent Force Systems	HW03
4	Apr 01	Ch. 4.1 ~ Ch. 4.5	Stress and Strain under Axial Loading Stress- Strain Diagram and Hooke's Law	HW04

5	Apr 08	Ch. 4.6 ~ Ch. 4.11	Thermal Effect Deformation under Axial Loading	HW05
6	Apr 15	Sec Exam 01		Design Exercise 01
7	Apr 22	Ch. 5.1 ~ Ch. 5.5	Moments	HW06
8	Apr 29	Ch. 5.6 ~ Ch. 5.8	Equivalent Systems Centroids, Center of Mass, and Distributed Loads	HW07
9	May 06	Ch. 5.9 – 5.11	Centroids of Composite Bodies Distributed Loads on Structural Members	HW08
10	May 13	Sec Exam 2		Design Exercise 02
11	May 20	Ch. 6.1 ~ Ch. 6.3	Free-Body Diagrams Equilibrium of Rigid and Deformable Bodies	HW09
12	May 27	Ch. 6.4 ~ Ch. 6.5	Frame & Machines Statically Indeterminate Problems	HW10
13	May 25	Ch. 6.6 – 6.9	Plane Truss Equilibrium in 3D and Friction	HW11
14	Jun 03	Ch. 7.1 ~ Ch. 7.4	Torsion I	HW12
15	Jun 10	Ch. 7.5 ~ Ch. 7.8	Torsion II	HW13
16	Jun 17		Course Review	HW14
17	Jun 24	Sec Exam 03		

In-Class Practices	Hands-on calculation practices will be given during the class throughout the semester. Purpose is to promote in-class discussions and keep students in-sync with course material during lecturing.
Homework	Problem sets will be distributed each week after the class. Each problem set is designed to build upon the material covered in the preceding lectures and recitations. Homework assigned in a particular class is due at 8:15 AM on the day of the next class period, unless otherwise posted. <u>Late HW will not be accepted.</u>
Design Exercises	<p>There will be two, open-ended design exercises assigned throughout the semester. It is a take-home assignment and each will take ~one week to complete.</p> <p>At the end of each exercise, prepare a concise report to summarize your efforts - e.g., a dimensioned sketch; an explanation of what parameters are critical; a restating of specifications; a note of difficult constraints.</p> <p>Document your train of thought and record your design iterations on achieving your final solutions in the design analysis report. Think of it this way: process is as important as product; means as important as ends.</p> <p>Grading your design analysis report will weigh in on quality of the written report, clarity of your design logic as well as thoroughness of your design analysis. These factors are not entirely independent. If your presentation is too cryptic or unreadable, evaluation of your analysis may be impossible and you will receive low credit. If your analysis omits needed calculation details in support of your argument, then your conclusions will be judged reckless and technically unsound.</p>

Exams	<p>There will be three section exams. The final exam is comprehensive. The exams in this course will be closed book and closed note.</p> <p>A formula sheet prepared by students containing nothing but formula will be allowed for the test. <u>No make-up will be given for the missing exam.</u> Exams missed due to unpredictable events will be dealt with on a case-by-case basis.</p>																																																
Exam Calculator	<p>No programmable calculator of any kind is permitted in ME exams. Students can use their calculator of choice for other assignments.</p>																																																
Grades	<p>In-Class Practices: 15% Homework 20% Section Exams: 45% Design Exercises: 20%</p> <p>附件：等级成绩和百分成绩、绩点对照表</p> <table border="1" data-bbox="402 604 1304 890"> <thead> <tr> <th>字母等级</th> <th>A</th> <th>A-</th> <th>B+</th> <th>B</th> <th>B-</th> <th>C+</th> <th>C</th> <th>C-</th> <th>D+</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>中文等级</td> <td colspan="2">优秀</td> <td colspan="2">良好</td> <td colspan="2">中等</td> <td colspan="4">合格</td> <td>不合格</td> </tr> <tr> <td>百分制</td> <td>100-90</td> <td>89-85</td> <td>84-80</td> <td>79-76</td> <td>75-73</td> <td>72-70</td> <td>69-66</td> <td>65-63</td> <td>62-61</td> <td>60</td> <td><60</td> </tr> <tr> <td>绩点</td> <td>4</td> <td>3.7</td> <td>3.3</td> <td>3</td> <td>2.7</td> <td>2.3</td> <td>2</td> <td>1.7</td> <td>1.3</td> <td>1</td> <td>0</td> </tr> </tbody> </table>	字母等级	A	A-	B+	B	B-	C+	C	C-	D+	D	F	中文等级	优秀		良好		中等		合格				不合格	百分制	100-90	89-85	84-80	79-76	75-73	72-70	69-66	65-63	62-61	60	<60	绩点	4	3.7	3.3	3	2.7	2.3	2	1.7	1.3	1	0
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Class Attendance	<p>Students are expected to attend every class period.</p> <p>Early is on time, on time is late. As a courtesy to your fellow classmates, be punctual and arrive no later than the class starting time.</p>																																																
Academic Honesty	<p>All of us are equally responsible for ensuring a fair and positive learning environment. Students are permitted to discuss homework assignments together, but should do their own work when preparing a problem solution.</p> <p>All exams are to be completed without unauthorized assistance. Any student caught cheating on an assignment or exam will receive disciplinary action, up to and including receiving a grade of "F" for the course.</p>																																																