

HAGERSTOWN COMMUNITY COLLEGE

COURSE: EGR 203 Mechanics of Materials (3 Credits)

INSTRUCTOR:

SEMESTER/YEAR: 17/Fall

SEMESTER/YEAR:

TEXTBOOK: Mechanics of Materials, Tenth Edition
R. C. Hibbeler, Prentice-Hall
ISBN-13: 978-0-13-325442-6

COURSE DESCRIPTION: This course studies the deformation of engineering materials in relation to stress and temperature. It includes axial, biaxial, torsional, shearing, combined and statically indeterminate loadings of beams, columns, shafts, tanks and connections, as well as deflection, and an introduction to plastic analysis. Prerequisites : EGR 108 and MAT 203 or concurrent registration in MAT 203

STUDENT LEARNING OUTCOMES: The student will demonstrate the following:

1. Determine the internal forces and moments produced in objects subjected to various forces.
2. Calculate the stress and strain in materials subjected to various loadings.
3. Calculate material properties (E, G, ν) and apply these properties to the solution of engineering problems and the derivation of basic equations for stress.
4. Calculate centroids and moments of inertia for plane areas
5. Solve problems relating to stresses in beams and shafts (bending, shear, torsion and axial)
6. Solve beam deflection problems
7. Analyze statically indeterminate shafts and beams
8. Solve stress transformation problems and principal stresses using Mohr's circle
9. Perform stress analysis under combined loading – 2D and 3D
10. Perform analysis of columns

TOTAL HOURS OF COURSEWORK

Direct Faculty Instruction: 1 hour/week/credit for 15 weeks; 50 min = 1 classroom hour
(50 min x 3 credits x 15 weeks) = 2250 minutes = 37.5 hours

Student Work Outside the Classroom: 3 hours/week/credit for 15 weeks
(3 hrs x 3 credits x 15 weeks) = 135 hours

	Direct Faculty Instruction	Student Work (Out of Class)
In Class Lectures + In Class Exams	37.5 Hours	
3 Exams (2 Tests and Final Exam)		40 Hrs.
Research Assignment		10 Hrs
Homework Assignments		85 Hrs.
TOTAL	37.5 Hours	135 Hours

ASSESSMENT PROCEDURES:

Grading for this course will consist of the following:

General: Course guidelines

- Reading Assignments: A reading assignment will be given for every class period. The reading assignment will generally cover the material to be covered during the next class lecture. Students are responsible for completing the reading assignment **before the next class period**.
- Collaboration: Students should expect to spend a significant amount of time outside of class meetings completing homework and reading assignments. A good rule of thumb is 3 hours per course credit hour. To facilitate the student's comprehension of the course material, discussion of the course material and homework assignments between students is encouraged. However,
 - All work turned in for homework assignments **must be a student's individual work** and may not be a group effort. Furthermore, homework assignments **may not be copied in full or in part from another student's work or any other source**.
 - No collaboration of any kind is permitted on any take home exam.
 - Any assignments that, in the opinion of the instructor, violate the above guidelines will receive a grade of zero. Repeated violations of the above guidelines will result in the student receiving a failing grade for the class.

Attendance: Attendance is **mandatory** for all class meetings.

- The student is responsible for obtaining all lecture notes and assignments, from another student in the class, for the day(s) that they are absent from class.
- If the student will be absent from a class when an assignment is due, ***it is the student's responsibility*** to arrange for their assignment to be turned into the instructor **before** the beginning of the class meeting.

Homework: (10%):

- Homework assignments are **always** due the on the specified due date.
- Homework assignments **must** be turned at the start of the class on the day in which they are due. Homework problems that are turned in late **will be docked 10% for each day late. Homework will not be accepted after solutions have been posted.**
- Homework problems must neat and legible with answers clearly indicated and with **appropriate units**. Homework problems that cannot be easily read **will not be graded**. Homework must be submitted on green engineering paper. Use the front of the engineering paper only.
- Material from all reading assignments may be covered on the homework assignments whether or not the material was covered in lecture. Material from all lectures may be covered on the homework assignments whether or not the material is contained in the reading assignments.
- To account for unforeseen circumstances, each student's lowest two homework grades will be dropped in the calculation of their final grade.

Research Project (10%):

- Each student will research a catastrophic structural failure and prepare a written report.
- The report will detail the selected engineering failure, document the failure both technically and with respect to human and economic impacts, document the cause of the failure, and identify 'lessons-learned' which will prevent repeat failures.
- The report must be typed and include embedded figures, graphs and pictures. A reference sheet with appropriate reference attribution is required.

Midterm Exams (50%): Exam 1 and 2 are worth 25% of the final grade.

- The date of all midterm exams will be announced at least one week before the class meeting during which the exam will be given.
- All midterm exams **must** be taken when scheduled unless prior coordinated with the instructor.
- Exams will be taken in class or at the Testing Center. For tests in the Testing Center, test start and stop periods will be announced in class.
- If a take home exam is given, the exam **must** be turned in within the first 5 minutes of the class meeting at which it is due. Exams that are turned in late **will not be graded**.
- Material from all reading assignments may be covered on the exams whether or not the material was covered in lecture. Material from all lectures may be covered on the exams whether or not the material is contained in the reading assignments.
- Students will be allowed to prepare one 8.5 by 11.5 inch equation sheet for each exam. **No explanations or examples are allowed on the equation sheet.** The equation sheet must be turned in with the exam.

Final Exam (30%):

- The final exam **must** be taken when scheduled. **There are no makeup final exams.**
- Material from all reading assignments may be covered on the exams whether or not the material was covered in lecture. Material from all lectures may be covered on the exams whether or not the material is contained in the reading assignments.
- Students will be allowed to prepare one 8.5 by 11.5 inch equation sheet for the exam. **No explanations or examples are allowed on the equation sheet.** The equation sheet must be turned in with the exam.

Grading Scale

90-100%	A
80-89%	B
70-79%	C
60-69%	D
Below 60%	F

COURSE POLICIES:

THE INSTRUCTOR RESERVES THE RIGHT TO MODIFY THE COURSE CONTENT AND/OR THE EVALUATION (TESTING) PROCEDURES AS DEEMED NECESSARY.

Hagerstown Community College's Attendance Policy: Students are expected to attend all classes. In the case of absence due to emergency, or participation in Official College functions, it is the student's responsibility to confer with the instructor about the absence and missed course work. Further, **it is the student's responsibility to withdraw officially from any class, which he/she ceases to attend.** Failure to do so will result in the recording of an "F" grade. Students absent from an announced test or exam, unless authorized, may be given an equivalent exam at a later date at the discretion of the instructor.

Emergency/Inclement Weather: Listen to your local news for cancellations or delays. You may also call the college at 301-790-2800 or log onto the website at www.hagerstowncc.edu.

Honor Code: Upon admission to HCC all students sign a pledge to uphold an honor system which holds the qualities of honesty and integrity in highest regard for the duration of their educational experience. The HCC Honor Code Policy and Procedures, also referred to as Academic Integrity, is published in the Student Handbook and may be obtained in the Student Activities Office.

CONTACT INFORMATION:

Office Hours:

SERVICES FOR STUDENTS WITH DISABILITIES:

Students may receive reasonable accommodations if they have a diagnosed disability and present appropriate documentation. Students seeking accommodations are required to contact the Disability Support Services (DSS) office as early as possible. Students may contact a DSS staff member for an appointment at dss@hagerstowncc.edu or at 240-500-2530.