The University of Alabama

Department of Aerospace Engineering and Mechanics

AEM 201 – Statics **Spring 2015**

Text: Engineering Mechanics Statics, 13th Edition, Pearson Prentice Hall, R. C.Hibbeler

Class	Day	Date	Topics	Text
1	W	1/7	No Class: Make-up lecture January 8th recitation	1.1-6
	R	1/8	Recitation, 7-9 pm: Class Introduction, General Principles, MasteringEngineering	
2	F	1/9	Scalars, Vectors, Vector Operations, Vector Addition of Forces	2.1-3
3	M	1/12	Addition of a System of Coplanar Forces	2.4
4	W	**1/14***	Cartesian Vectors, Addition of Cartesian Vectors	2.5-6
	R	1/15	Recitation, 7-9 pm	
5	F	1/16	Position Vectors, Force Vector Directed Along a Line	2.7-8
	M	**1/19**	**HOLIDAY – MLK Day**	
6	W	1/21	Dot Product	2.9
	R	1/22	Recitation, 7-9 pm	
7	F	1/23	Equilibrium of a Particle, FBD, Coplanar Force Systems	3.1-3
8	M	1/26	Equilibrium of a Particle, FBD, Coplanar Force Systems	3.1-3
9	W	1/28	Three-Dimensional Force Systems	3.4
	R	1/29	Recitation, 7-9 pm	
10	F	1/30	Three-Dimensional Force Systems	3.4
11	M	2/2	Moment of a Force, Cross Product, Vector Formulation, Principle of Moments	4.1-4
12	W	2/4	Moment of a Force, Cross Product, Vector Formulation, Principle of Moments	4.1-4
	R	**2/5**	**Exam #1, 7-9 pm, Chapters 1-3**	
13	F	2/6	Moment of a Force about a Specified Axis	4.5
14	M	2/9	Moment of a Couple	4.6
15	W	2/11	Simplification of a Force and Couple System	4.7
	R	2/12	Recitation, 7-9 pm	
16	F	2/13	Further Simplification of a Force and Couple System	4.8
17	M	2/16	Reduction of a Simple Distributed Loading	4.9
18	W	2/18	Conditions for Rigid-Body Equilibrium, Free-Body Diagrams	5.1-2
	R	2/19	Recitation, 7-9 pm	
19	F	2/20	Equations of Equilibrium, Two- and Three-Force Members	5.3-4
20	M	2/23	Equations of Equilibrium	5.3-4
21	W	2/25	Equilibrium in Three Dimensions	5.5-7
	R	2/26	Recitation, 7-9 pm	
22	F	2/27	Equilibrium in Three Dimensions	5.5-7
23	M	3/2	Simple Trusses, Method of Joints, Zero-Force Members	6.1-3
24	W	3/4	Simple Trusses, Method of Joints, Zero-Force Members	6.1-3
	R	**3/5**	**Exam #2, 7–9 pm, Chapters 1-5**	
25	F	3/6	Method of Sections	6.4
26	M	3/9	Frames and Machines	6.6
27	W	3/11	Frames and Machines	6.6

	R	3/12	Recitation, 7-9 pm	
28	F	3/13	Frames and Machines	6.1-6
	3/16-3/20		**Spring Break**	
29	M	3/23	Internal Forces and Moments	7.1
30	W	**3/25+**	Shear and Moment Equations and Diagrams	7.2
	R	3/26	Recitation, 7-9 pm	
31	F	3/27	Shear and Moment Equations and Diagrams	7.2
32	M	3/30	Relations between Distributed Load, Shear and Moment	7.3
33	W	4/1	Relations between Distributed Load, Shear and Moment	7.3
	R	4/2	Recitation, 7-9 pm	
	F	**4/3**	**Honors Day**	
34	M	4/6	Dry Friction	8.1-2
35	W	4/8	Dry Friction	8.1-2
	R	**4/9**	**Exam #3, 7-9 pm, Chapters 1-7**	
36	F	4/10	Wedges	8.3
37	M	4/13	Flat Belts	8.5
38	W	4/15	Center of Gravity, Center of Mass, Centroid	9.1
	R	4/16	Recitation, 7-9 pm	
39	F	4/17	Composite Bodies	9.2
40	M	4/20	Moments of Inertia for Areas, Parallel-Axis Theorem, Radius of Gyration	10.1-3
41	W	4/22	Moments of Inertia for Composite Areas	10.4
	R	4/23	Recitation, 7-9 pm	
42	F	4/24	Mass Moment of Inertia	10.8
	T	**4/28**	**Final Exam, 11:30 am – 2:00 pm, Chapters 1-10**	

*** Last day to drop a course without a grade of "W" is 1/14.**

+ Last day to drop a course with a grade of "W" is 3/25.

AEM 201 – Statics Academic and Administrative Policies

Instructor: Dr. James P. Hubner **E-Mail:** phubner@eng.ua.edu

Office: 221 Hardaway Hall **Phone:** 348-1617

Lecture : MWF: 10:00 – 10:50, Russell Hall 159

Office Hours: MW: 11:00 – 11:40, Russell Hall 356
T: 8:30 – 10:00, Hardaway Hall 221 (office)

Pre-requisites: PH 105 or PH 125, MATH 125 or MATH 145, ENGR 103

You are expected to be proficient through Physics I and Calculus I and able to sketch clearly. Proficiency in both geometry and trigonometry is expected.

Textbook: ***Engineering Mechanics Statics*****,** 13th Edition, Pearson Prentice Hall, R. C. Hibbeler. A MasteringEngineering access code is required.

Web Page: Blackboard (http://ualearn.blackboard.com) and MasteringEngineering (http://www.masteringengineering.com/) will be the primary web portals used for this course (syllabus, lecture notes, access to lecture videos, MasteringEngineering HW assignments, etc). **For technical questions regarding Blackboard, contact the Office of Information Technology at 348-3532.**

Blackboard Learn:

Blackboard (https://ualearn.blackboard.com/) requires your myBama username and password to access. Once logged-in, select **201510-SS.AEM-201-001.AEM-201.996** under My Courses. This is a combined (super-section) Blackboard course that includes both on-campus and distance-learning students. Blackboard can also be used to access Tegrity videos of the course lectures (Tegrity Classes link on the left boarder of the course home page) and PDF files of solved examples from the lecture. Recitation and help sessions will not be recorded.

MasteringEngineering:

MasteringEngineering is the online homework environment for Statics. Assignments will be posted the day before each lecture. These assignments are due at 5 pm the day of the following lecture. Late assignments lose 1% point per hour.

To register, go to www.masteringengineering.com, select Register Now/Student, and follow directions.

Our course ID for MasteringEngineering is AEM201SPRING2015HUBNER.

Objectives: The main objective of this first course in engineering mechanics is to develop the ability to analyze engineering problems involving the equilibrium of forces in a simple and logical manner and to obtain solutions through the application of the basic principles of mechanics.

The successful student will have the ability to identify, analyze and solve engineering mechanics problems involving

- the application of vectors that represent forces,
- mathematical operations with vectors including the dot product, cross product and scalar triple product,
- vector addition of forces on a particle in 2D and 3D,
- the equilibrium of a particle in 2D and 3D,
- moments about a point and axis,
- the simplification of a force and couple system,
- distributed loads,

- free body diagrams,
- the equilibrium of a rigid body in 2D and 3D,
- trusses, frames and machines,
- shear force and bending moment diagrams of beams,
- dry friction,
- and the calculation of a body centroid, center of mass, area moment of inertia and mass moment of inertia.

Statics (rigid bodies at rest) is a foundational course for aerospace, civil, construction, environmental, materials and mechanical engineering. Follow-on mechanics courses include mechanics of materials (deformable bodies at rest), dynamics (rigid bodies in motion), and fluid mechanics (fluids at rest and in motion).

Attendance: Attendance at all class meetings is expected.

Wireless Devices: Cell phones and other wireless devices must be set to silent mode or otherwise disabled before the start of class.

Homework: Homework consists of (1) readings in the text, (2) tutorials and online problems in **MasteringEngineering**, the Pearson Prentice Hall online tutorial and homework system (http://www.masteringengineering.com), and (3) periodically assigned hand-written assignments.

Readings: Section topics should be completed prior to the lecture on the topic.

MasteringEnginering: These are assigned each lecture (opened 8 am the day before the topic lecture) and are due 5 pm the day of the subsequent lecture. There are no drops for ME HW; you can submit late work at a penalty of 1% per hour.

Hand-written HW: These will be announced and are assigned with specific due dates and format requirements. Assignments will be posted on Blackboard.

Recitation: Recitations, as shown on the Class Schedule, are on Thursday evenings (7 – 9 pm) with the exception of exam nights. These periods are optional are used for further instruction and review.

Help Session and Tutoring:

Help sessions will be held each Tuesday and Sunday in Hardaway Hall 207 between 5 and 7 pm starting January 13th. There will be one to two TAs available to help answer your questions.

If you are interested in individual tutoring, then contact me and I will send you a list of former statics students that performed well in the course and expressed interest in tutoring. From that point, all arrangements are between you and the student tutor.

Distance Learners: **Students who reside more than 50 miles from campus** are required to obtain a proctor for examinations, else take the exam on campus at the designated location. Exams **must be** taken on the evening of the scheduled exam date. Please refer to the Proctor information link: http://bamabydistance.ua.edu/student-services/proctored_testing.html.

Proctoring information must be provided to the College of Continuing Studies and to the course instructor no later than **January 26th, 2015**. The proctor must have the appropriate hardware to scan and email the completed examinations to the Distance Learning office. **Proctor U does not proctor paper exams**. For further information, call 205-348-0089.

Students residing within 50 miles of the campus are required to take examinations on campus. These examinations are Thursdays 7-9 pm (see schedule for dates). All examinations **must** be taken on the date shown in the course schedule.

Grading:

MasteringEngineering Homework (no drops, 1% deduction per 1 late)	10%
Recitation and In-class Assignments (1 drop)	10%
Three Examinations (closed book/notes, no drops)	54%
Final Examination (**comprehensive**)	26%

Option A: If you have taken and earned an 80 or higher on all three exams, then you make take a shortened final that only covers new material (Chps 8 -10). Each exam and the shortened final will be weighted equally (20%). **Notification to implement this option is required 24 hours prior to the exam.**

Option B: If you have taken all three exams and it is to your advantage, the comprehensive final will replace your lowest exam score. **Notification to implement this option is not required; it is automatically calculated.**

If you miss an exam for a valid and **documented** reason, then your score on the final exam will be substituted for the missed exam score; otherwise, the missed exam will be scored as 0. Only one such substitution is permitted.

Scale:

90% will earn at least an	A-
80% will earn at least a	B-
70% will earn at least a	C-
60% will earn at least a	D-
< 60% is failing	F

Exams: Exams are closed book and notes. Only a pencil and calculator are required. **Smartphones are not allowed.**

Exam Re-grade: Requests for a re-grade of a returned exam **must be submitted in writing** (with the graded exam attached) **no later than the next class day following the return of the graded exam**. A clear description is expected stating the concern or correction and how many points should be awarded. In this event, the entire exam, not just a single problem requested by the student, is subject to review. **Upon review, the exam score may increase, remain the same, or decrease.**

Electronic Communication:

Both MasteringEngineering, the Pearson Prentice Hall online tutorial and homework system (http://www.masteringengineering.com), and the University of Alabama Blackboard Learn system (https://ualearn.blackboard.com/) will be used. Students are responsible for checking MasteringEngineering and Blackboard on a regular basis. **Students are expected to check their Crimson email account regularly.** Other e-mail systems will not be used.

There will be a discussion board "*Ask your Statics questions here:*" available through Blackboard. It is an open forum for statics questions, and it will be monitored by the instructor and TAs (usually in the evening). Specific questions regarding help with solving homework problems should be addressed here as well as in tutoring and recitation sections.

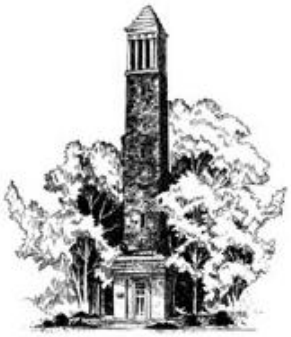
Use this forum instead of email (unless a concern of personal nature). Professional decorum is required and access is a privilege that can be revoked.

Collaboration: Discussion and the exchange of ideas are important parts of the learning process and are encouraged activities in a community of scholars. **However, you must ensure that any work you submit for grading is your own.**

Professionalism: All students in attendance at the University of Alabama are expected to be honorable and to observe standards of conduct appropriate to a community of scholars. The University expects from its students a higher standard of conduct than the minimum required to avoid discipline. Academic misconduct includes all acts of dishonesty in any academically related matter and any knowing or intentional help or attempt to help, or conspiracy to help, another student except when explicitly permitted by the instructor. The Academic Misconduct Disciplinary Policy will be followed in the event of academic misconduct.

Academic Honor Pledge: "I promise or affirm that I will not at any time be involved with cheating, plagiarism, fabrication, or misrepresentation while enrolled as a student at The University of Alabama. I have read the Academic Honor Code, which explains disciplinary procedure resulting from the aforementioned. I understand that violation of this code will result in penalties as severe as indefinite suspension from the University."

Students are reminded that they are preparing for a profession (engineering) which has standards of ethics for professional behavior. These standards will be applied toward all class activities and assignments. The Code of Ethics for Engineers is maintained by the American Association of Engineering Societies. http://www.aaes.org/CodesofEthics.asp



THE CAPSTONE CREED

As a member of
the University of Alabama community,
I will pursue knowledge;
act with fairness, honesty, and respect;
foster civic responsibility;
and strive for excellence.

THE UNIVERSITY OF
ALABAMA
FOUNDED 1831

Services: **If you are registered with the Office of Disability Services, please make an appointment as soon as possible to discuss any course accommodations that may be necessary.**

If you have a disability, but have not contacted the Office of Disability Services, please call (205) 348-4285 (http://ods.ua.edu)or visit 133-B Martha Parham Hall East to register for services. Students who may need course adaptations because of a disability are welcome to make an appointment to see the instructor during office hours. Students with disabilities must be registered with the Office of Disability Services, 133-B Martha Parham Hall East, before receiving academic adjustments.

Severe Weather Guidelines:

The guiding principle at The University of Alabama is to promote the personal safety of our students, faculty and staff during severe weather events. It is impossible to develop policies which anticipate every weather-related emergency. These guidelines are intended to provide additional assistance for responding to severe weather on campus.

UA is a residential campus with many students living on or near campus. In general classes will remain in session until the National Weather Service issues safety warnings for the city of Tuscaloosa. Clearly, some students and faculty commute from adjacent counties. These counties may experience weather related problems not encountered in Tuscaloosa. Individuals should follow the advice of the National Weather Service for that area taking the necessary precautions to ensure personal safety. Whenever the National

Weather Service and the Emergency Management Agency issue a warning, people in the path of the storm (tornado or severe thunderstorm) should take immediate life saving actions.

When West Alabama is under a severe weather advisory, conditions can change rapidly. It is imperative to get to where you can receive information from the National Weather Service and to follow the instructions provided. Personal safety should dictate the actions that faculty, staff and students take.

The Office of University Relations will disseminate the latest information regarding conditions on campus in the following ways:

- Weather advisory posted on the UA homepage
- Weather advisory sent out through UA Alerts to faculty, staff and students
- Weather advisory broadcast over WVUA at 90.7 FM
- Weather advisory broadcast over Alabama Public Radio (WUAL) at 91.5 FM
- Weather advisory broadcast over WVUA-TV/WUOA-TV, and on the website at http://wvuatv.com/content/weather. WVUA-TV Home Team Weather provides a free service you can subscribe to which allows you to receive weather warnings for Tuscaloosa via e-mail or cell phone. Check http://wvuatv.com/content/free-email-weather-alerts for more details and to sign up for weather alerts.

In the case of a tornado warning (tornado has been sighted or detected by radar; sirens activated), all university activities are automatically suspended, including all classes and laboratories. If you are in a building, please move immediately to the lowest level and toward the center of the building away from windows (interior classrooms, offices, or corridors) and remain there until the tornado warning has expired. Classes in session when the tornado warning is issued can resume immediately after the warning has expired at the discretion of the instructor. Classes that have not yet begun will resume 30 minutes after the tornado warning has expired provided at least half of the class period remains.

Disclaimer: Assignments and course content are subject to modification when circumstances or sound pedagogy dictate and as the course progresses. If a change is made, then due notice will be given.