

# Engineering Statics

ET 232-01 (CRN 12301) – 3 Credit Hours

School of Engineering + Technology  
Western Carolina University – Spring 2017

**Class hours:** Lectures, Tue & Thu 9:05 am – 10:20 am (Belk 104)

**Instructor:** Dr. Oai Ha  
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**Office hours:** Mon & Wed 10:30 - 11:30 a.m., 3:30 – 5:00 p.m., or by appointment.

**Course Description:** Study of forces and the effect of forces acting on static bodies.

**Course Goals:** At the successful completion of this course, the student will be able to:  
1. establish relationship between external loads & internal stresses for an elastic material;  
2. analyze forces in trusses, frames, & beams;  
3. determine necessary parameters to meet design requirements of a particular member; and  
4. analyze torsion in circular sections.

**Prerequisites:** MATH 145 or 146; PHYS 130

**Required Text:** Leonard Spiegel & George F. Limbrunner, Applied Statics and Strength of Materials, 5<sup>th</sup> Edition, Prentice-Hall, 2009.

**Website:** *Blackboard* available from WCU homepage.

**Instructional Approach:** Two lecture/recitation periods per week, and reading assignments. Open class discussion is an important element of this class. Students are responsible for the content of all reading assignments, *whether or not the material is covered in class*.

**Evaluation:** Your final grade will be determined based on the following weighting for the following course assignments:

Homework (drop lowest HW grade) & Reading Quizzes.....	25%
Semester Project .....	10%
Midterm Exam (highest grade) .....	25%
Midterm Exam (lowest grade) .....	20%
Final Exam.....	20%

**Grading Scale:**

97-100 .....	A+	73-76.9 .....	C	Note: 1) Grade cutoff points may be lowered at the discretion of the instructor. 2) Scores and grades are only an indication of what you perform in this course, not who you are.
90-96.9 .....	A	70-72.9 .....	C-	
87-89.9 .....	B+	67-69.9 .....	D+	
83-86.9 .....	B	63-66.9 .....	D	
80-82.9 .....	B-	60-62.9 .....	D-	
77-79.9 .....	C+	0-59.9 .....	F	

**Attendance:** You have the responsibility to be here for class. At the discretion of the instructor, your final grade may be lowered by one full letter grade for every 3 absences. There is no distinction between *excused* and *unexcused* absences.

**Assignments:** *Homework:* No late homework! Working together on HW is encouraged, but each student must contribute to the effort. Your *work* and *approach* will be graded, not just the answer. The thought

process is more important than the final answer. HW solutions for HW assignments will be posted on *Blackboard*, as will exam solutions.

- Honor Code:** Refer to [Academic Integrity Policy and Reporting Process](#) at the WCU website or at the end of this syllabus.
- CoursEval:** This course will be evaluated using the online evaluation tool, CoursEval. The time window for evaluation will be April 2 to 29, 2017 (8a.m.). Your feedback through this student assessment of instruction (SAI) is very important and truly valued.
- Disabilities:** Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities and/or medical conditions. Students who require reasonable accommodations must identify themselves as having a disability and/or medical condition and provide current diagnostic documentation to the Office of Disability Services. All information is confidential. Please contact the Office of Disability Services at (828) 227-3886 or come by Suite 135 Killian Annex for an appointment.
- Support:** Student Support Services provides support to students who are either first-generation, low-income or those who have disclosed a disability with: academic advising, mentoring, one-on-one tutorial support, and workshops focused on career, financial aid and graduate school preparation. You may contact SSS at (828) 227-7127 or email [sssprogram@wcu.edu](mailto:sssprogram@wcu.edu) for more information. SSS is located in the Killian Annex, room 138.
- WaLC:** The Writing and Learning Commons (WaLC) is a free student service, located in BELK 207, providing course tutoring, writing tutoring, academic skills consultations, international student consultations, graduate and professional exam preparation resources, and online writing and learning resources for all students. To schedule tutoring appointments, visit the WaLC homepage (<http://walc.wcu.edu>) or call 828-227-2274.
- Distance students and students taking classes at Biltmore Park are encouraged to use Smarthinking (<http://www.wcu.edu/academics/edoutreach/distance-online-programs/student-resources/services-for-distance-students.asp>) and the WaLC's online resources.
- Math Tutor:** The Mathematics Tutoring Center provides tutoring in all lower-division math and many CS courses (455 Stillwell, <http://mathlab.wcu.edu>, 828-227-3830), help with mathematical concepts in other disciplines, and workshops on study skills specific to mathematics courses. Tutoring is available on a drop-in basis, 9 am - 5 pm and 6 - 9 pm Monday-Thursday, and 9 am - 5 pm on Friday.
- Statics Tutor:** The Writing and Learning Commons (WaLC) provides **four** tutors helping students in the course ET-232 this semester. The tutors are available at the WaLC (Belk 207) on both drop-in and advance appointment bases. Appointments must be made 24 hrs in advance.
- 1) Tyler Zaroff: Available on MW 11:00 am-1 pm TR 10:30 am-1:30 pm. Contact information: 980-621-3636 (cell); [tdzaroff1@catamount.wcu.edu](mailto:tdzaroff1@catamount.wcu.edu)
  - 2) Luke Pope: MWF, 9:00-11:00 am and 3:00-5:00 pm. Contact information: 828-541-1501 (cell); [lwpope1@catamount.wcu.edu](mailto:lwpope1@catamount.wcu.edu)
  - 3) Kenneth Jay: Available on: MW 6pm-8pm, TR 6:30pm-9pm, F 1pm-4pm; Contact information: (336)-583-4397; [Kdjay1@catamount.wcu.edu](mailto:Kdjay1@catamount.wcu.edu)
  - 4) Alec Thomas. Contact information: [amthomas12@catamount.wcu.edu](mailto:amthomas12@catamount.wcu.edu)
- Calendar:** Academic Calendar includes dates for all breaks, university closures, final exams, etc. The academic calendar can be found at: <http://www.wcu.edu/academics/campus-academic-resources/registrar-office/academic-calendar.asp>.
- Registrar:** In addition to the Academic Calendar the Registrar's webpage has the final exam schedule, schedule of classes, and much more. Visit this site: <http://www.wcu.edu/learn/academic-services/registrar-office/>

**WEEKLY LESSON PLAN**

Wk #1: Introduction, Syllabus, Trig/Physics Review ..... 1  
Wk #2: Statics Principles..... 2  
Wk #3: Resultants of Coplanar Force Systems ..... 3  
Wk #4: Equilibrium of Coplanar Force Systems, Review ..... 4  
Wk #5: **Tues Feb 7, Exam #1**, Equilibrium of Coplanar Force Systems ..... 4  
Wk #6: Coplanar Force Systems ..... 4  
Wk #7: Analysis of Structures (Trusses) ..... 5  
Wk #8: Analysis of Structures (Method of Joints) ..... 5  
**Spring Break Mar 6 to 10, 2017 (No class)**  
Wk #9: Analysis of Structures (Method of Joints, Method of Sections) ..... 5  
Wk #10: Analysis of Structures (Method of Sections) ..... 5  
Wk #11: Analysis of Structures (Analysis of Frames), Review ..... 5  
Wk #12: **Tues April 4, Exam #2**, Stresses and Strains..... 9  
Wk #13: Stresses and Strains..... 9  
Wk #14: Torsion in Circular Sections ..... 12  
Wk #15: Course Review  
Wk #16: Final Exam, Wed May 5 **3rd**, 2017, noon-2:30 pm

I plan to enjoy this course, and hope that you do, as well. Don't hesitate to call me or schedule an appointment if you have any questions concerning the material. I encourage an open line of communication and look forward to having spirited discussions concerning course topics.

*NOTE: This syllabus is subject to change at the discretion of the instructor.*

**Homework #0**

- Meet with the professor for 5 or 10 minutes to talk about work experiences, post-graduation plans, hobbies, etc.
- This may be done in groups of up to 3.
- Yes, this counts as much as any other HW assignment during the semester.
- Complete between Weeks 2 and 4, or from Jan 17 to Feb 3, 2017.

## **Academic Integrity Policy and Reporting Process:**

This policy addresses academic integrity violations of undergraduate and graduate students. Graduate students should read inside the parenthesis below to identify the appropriate entities in charge of that step of the process.

Students, faculty, staff, and administrators of Western Carolina University (WCU) strive to achieve the highest standards of scholarship and integrity. Any violation of the Academic Integrity Policy is a serious offense because it threatens the quality of scholarship and undermines the integrity of the community. While academic in scope, any violation of this policy is by nature, a violation of the Code of Student Conduct and will follow the same conduct process (see Article VII.B.1.a.). If the charge occurs close to the end of an academic semester or term or in the event of the reasonable need of either party for additional time to gather information timelines may be extended at the discretion of the Department of Student Community Ethics (DSCE).

### **I. General:**

This policy addresses academic integrity violations of undergraduate and graduate students.

Students, faculty, staff, and administrators of Western Carolina University (WCU) strive to achieve the highest standards of scholarship and integrity. Any violation of this policy is a serious offense because it threatens the quality of scholarship and undermines the integrity of the community.

Instructors have the right to determine the appropriate academic sanctions for violations of the Academic Integrity Policy within their courses, up to an including a final grade of “F” in the course in which the violation occurs.

### **II. Definitions:**

1. Cheating – Using, or attempting to use, unauthorized materials, information, or study aids in any academic exercise.
2. Fabrication – Creating and/or falsifying information or citation in any academic exercise.
3. Plagiarism – Representing the words or ideas of someone else as one’s own in any academic exercise.
4. Facilitation – Helping or attempting to help someone to commit a violation of the Academic Integrity Policy in any academic exercise (e.g. allowing another person to copy information during an examination).

### **III. Undergraduate and Graduate Academic Integrity Process:**

1. Within five (5) business days of the instructor’s knowledge of the alleged violation of the Academic Integrity Policy, s/he will inform his/her department head (or associate Dean of the graduate school when applicable) in writing of the allegation and proposed sanction(s).
2. Within ten (10) business days of the instructor’s knowledge of the alleged violation of the Academic Integrity Policy, the instructor will inform the student of the allegation, including the proposed sanction(s), in writing. In the written notification, the instructor will inform the student of his/her right to request a meeting with the instructor. During the meeting, the instructor shall complete the Academic Integrity Violation Faculty Resolution Form. If the student does not request a meeting with the instructor within five (5) business days of receipt of the written allegation(s), the student shall be

- deemed to have mutually resolved the matter and shall be bound to the sanction(s) outlined by the instructor in the written allegation. If the student does not request a meeting, the alleged violation of the Academic Integrity Policy shall not be subject to further review and/or appeal.
3. Within five (5) business days of meeting with the instructor, the student shall either appeal the decision to the department head or mutually resolve the matter by accepting the allegation and proposed sanction(s). No action by the student within five (5) business days of the meeting with the instructor shall constitute a mutual resolution and waiver of the student's rights to appeal pursuant to the Academic Integrity Policy. If the student does not respond within five (5) business days of meeting with the instructor, the alleged violation of the Academic Integrity Policy shall not be subject to further review and/or appeal.
  4. Within five (5) business days of receiving a student's appeal, the department head must schedule a meeting with the student. The instructor may be present during the meeting. During the meeting, the department head shall complete the Academic Integrity Violation Department Head Resolution Form. Only information submitted during the meeting with the student, or in the meeting between the instructor and the student, may be considered by the department head. The evidentiary standard for making a decision shall be preponderance of the evidence. The department head may agree or disagree with the allegation(s) of the instructor. The department head may also approve, overturn, or modify the sanction(s) proposed by the instructor. If the student does not attend the scheduled meeting with the department head, the matter will be heard in absentia and shall not be subject to further review and/or appeal.
  5. Within five (5) business days of meeting with the department head, the student shall either appeal the decision to an Academic Integrity Board or mutually resolve the matter by accepting the allegation and proposed sanction(s). The student must submit an appeal to the academic Dean listed on the Academic Integrity Violation Department Head Resolution Form. No action by the student within five (5) business days of the meeting with the department head shall constitute a mutual resolution and waiver of the student's rights to appeal pursuant to the Academic Integrity Policy. If the student does not respond within five (5) business days of meeting with the department head, the alleged violation of the Academic Integrity Policy shall not be subject to further review and/or appeal.
  6. Within seven (7) business days of receiving a student's appeal, the appropriate academic Dean must schedule an Academic Integrity Board hearing with the student. The Academic Integrity Board shall consist of a minimum of two (2) currently enrolled students and/or faculty members (with a minimum of one faculty member). A faculty member will serve as chair of the board. The instructor may be present during the hearing. Only information submitted during the hearing, or in the meetings between the instructor/department head and the student, may be considered by the hearing board. The evidentiary standard for making a decision shall be preponderance of the evidence. The hearing board may agree or disagree with the allegation(s) of the instructor. The hearing board may also approve, overturn, or modify the sanction(s) proposed by the instructor and/or department head. If the student does not attend the scheduled hearing, the matter will be heard in absentia and shall not be subject to further review and/or appeal. Within ten (10) business days of the hearing, the appropriate academic Dean shall review pertinent records and send the student written notification of the decision of the Academic Integrity Board.
  7. Within five (5) business days of receiving written notification of the decision of the Academic Integrity Board the student may accept the findings and sanctions of the board or submit an appeal to the designated academic Dean. No action by the student within five (5) business days of the meeting with the department head shall constitute a mutual resolution and waiver of the student's rights to appeal pursuant to the Academic Integrity Policy. If the student does not respond within five (5) business days of meeting with the Academic Integrity Board, the alleged violation of the Academic

- Integrity Policy shall not be subject to further review and/or appeal.
8. If the student elects to file an appeal of the decision of the Academic Integrity Board, she must submit a written appeal within five (5) business days of receiving written notification of the decision of the Academic Integrity Board to the designated academic Dean. An appeal to an academic Dean must be limited to the following grounds; 1) a violation or due process or 2) a material deviation from Substantive and Procedural Standards by the UNC Board of Governors (as set forth in the UNC Manual 700.4.1).
  9. If an appeal is heard by an academic Dean, s/he shall review pertinent records within ten (10) business days of receiving a valid appeal. The academic Dean may agree or disagree with the allegation(s) of the instructor. The academic Dean may also approve, overturn, or modify the sanction(s) proposed by the instructor, department head, and or Academic Integrity Board. Within five (5) days of making a decision, the academic Dean shall provide the student with a written decision. The decision of the academic Dean shall be final.
  10. The student must remain enrolled in the course related to the case, and may not be permitted to withdraw from the course related to the case, until all hearing timelines, notifications, and/or appeals have been completed.
  11. Upon resolution of each level of the case (no matter the outcome), the instructor, department head, and academic Dean must provide the Department of Student Community Ethics with all materials and documents related to the case (i.e. course syllabus, materials in violation of the Academic Integrity Policy, Instructor Resolution Form, Department Head Resolution Form, Academic Integrity Board decision letter, academic Dean decision letter, etc...). The Department of Student Community Ethics shall serve as the repository for all records associated with allegations and violations associated with the Academic Integrity Policy.

#### **IV. Academic Integrity Board:**

The Academic Integrity Board shall consist of a minimum of two (2) currently enrolled students and/or faculty members (with a minimum of one faculty member). A faculty member will serve as chair of the board. Students and faculty members serving on boards for each college will be selected by each college Dean. The Department of Student Community Ethics will train all board members prior to their service on a hearing board. Each academic Dean will convene hearing boards as necessary, and will determine a faculty member to serve as chair prior to a hearing.

#### **V. Sanctions:**

The instructor, department head, Academic Integrity Board, and/or academic Dean may impose academic sanctions permitted by the institution (not to exceed receiving a grade of “F” for the course). The instructor, department head, Academic Integrity Board, and/or academic Dean may not permanently remove the student from the course or suspend/expel the student from a program or the University. Student behavior of the magnitude to warrant consideration for permanent removal from the course or suspension/expulsion from a program or the University must be referred to the Department of Student Community Ethics.

#### **VI. Habitual Violations of the Academic Integrity Policy:**

Upon receipt of materials associated with violations of the Academic Integrity Policy, the Department of Student Community Ethics will determine if a student has previous violations of University policies. Students with a prior record of violations, or who commits a gross and/or egregious violation of the Academic Integrity

Policy, will be referred to the Department of Student Community Ethics for consideration of being subject to hearing proceedings as a habitual violator. Students with three or more violations of the Academic Integrity Policy will automatically be subject to hearing proceedings as a habitual violator. Students in this category are subject to course-related sanctions imposed by the instructor, department head, Academic Integrity Board, and/or academic Dean and University-level sanctions imposed by the Department of Student Community Ethics for habitual violations of University policies.

Additional information is available on the Student Success website under Student Community Ethics.