Course Description:
Basic theory of engineering mechanics, using calculus, involving the description of forces, moments, and couples acting on stationary engineering structures; equilibrium in two and three dimensions; free-body diagrams; friction; centroids; centers of gravity; and moments of inertia. Four semester hours, three hours lecture, three hours lab per week. Prerequisites: MTH 234 and PHY 241. (Same as EGR 250.) Lab fee required.

Prerequisites: PHY 241 & MTH 234      Co-Requisites: EGR/PHY 250L

Credits: 4 Hours      (Lecture: 3 Hours, Laboratory: 1 Hours)

Instructor: Christopher J. Aul

Textbook: *Vector Mechanics for Engineers: Statics & Dynamics*
Authors: Beer, Johnston, Mazurek, Cornwell, Self

Supplemental Materials: Engineering paper
Scientific calculator or better

Topics Covered:
Forces and moments in three dimensions analyzed with vector mechanics, centroids and centers of gravity, analysis of trusses, frames, and machines, beams, friction, moments of inertia of mass and area, virtual work.

Course Learning Outcomes
By the end of the course, a successful student will be able to:
1. Draw a complete free-body diagrams describing position of forces and moments in terms of vector components in two and three dimensions. (SO-2)
2. Apply appropriate equilibrium equations on a free-body diagram. (SO-1)
3. Work in teams to solve equilibrium problems discussed in class. (SO-3)
4. Determine resultant forces for a system acted upon by outside point and distributed forces. (SO-1)
5. Translate systems of forces and moments to equivalent systems. (SO-1)
6. Calculate forces in trusses and frames under equilibrium. (SO-1)
7. Find internal forces of a structure or system in equilibrium. (SO-1)
8. Analyze static systems that include forces from friction. (SO-1)
9. Calculate the centroids and centers of gravity for particles with an arbitrary shape. (SO-1)
10. Determine moment of inertia for a simple area. (SO-1)
11. Apply parallel-axis theorem to find moment of inertia for a complicated area. (SO-1)
12. Apply the basic method of virtual work to solve equilibrium problems. (SO-1)
**Student Outcomes**
Graduates of the program will show:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
Course Outline:
EGR/PHY 250 & 250L – Fall 2018
Engineering Statics
Department of Physics and Astronomy, Stephen F. Austin State University

Instructor: Christopher J. Aul, PhD
Office: 207D Ed & Gwen Cole STEM Building
Email: aulcj@sfasu.edu
Phone: 936-468-1512

Office Hours: MW 9-9:50am, TR 9am-12pm, or by appointment

Class Meetings: MWF 10:00-10:50 AM & Mon 2:00-4:50 PM, Room 402 STEM Building

Course Home Page: http://d2l.sfasu.edu

Course Description
Basic theory of engineering mechanics, using calculus, involving the description of forces, moments, and couples acting on stationary engineering structures; equilibrium in two and three dimensions; free-body diagrams; friction; centroids; centers of gravity; and moments of inertia. Four semester hours, three hours lecture, three hours lab per week. Prerequisites: MTH 234 and PHY 241. (Same as EGR 250.) Lab fee required.

Text and Materials
Vector Mech. for Engineers: Statics/Dynamics (CONNECT ACCESS REQUIRED)
Authors: Beer, Johnston, Mazurek, Cornwell, Self

It is necessary that you acquire this edition of the text. Homework and reading will be assigned assuming the student has this text. Hard copies of homework assignments will not be handed out to the student.

Other materials needed in the course:

- Engineering paper that is grid ruled (assignment submission)
- Scientific calculator or better (for exams and homework)
- Ruler, compass, any other drafting tools for FBD sketches

Grading Policy

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>15%</td>
</tr>
<tr>
<td>Exam 2</td>
<td>15%</td>
</tr>
<tr>
<td>Exam 3</td>
<td>15%</td>
</tr>
<tr>
<td>Homework, assignments, in-class activities</td>
<td>25%</td>
</tr>
<tr>
<td>Pre-Lecture assignments</td>
<td>10%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
</tbody>
</table>

Letter grades are based on the following ranges:

- A 90.0 – 100%
- B 80.0 - 89.9%
- C 70.0 - 79.9%
- D 60.0 - 69.9%
- F < 60.0%

The grade is based on three mid-term exams, one comprehensive final exam, homework which will be assigned in class, as well as in-class assignments. Exams will be graded on a 100 point scale, including the final, and homework will be averaged with in-class assignments for the final 25% of your grade.
Attendance Policy
Attendance will be taken at the beginning of class by instructor. If you have 3 unexcused absences, then your final grade will be reduced one letter grade. If you have 4 unexcused absences, you will receive an “F” in the course. A written and signed notice is required for an excused absence within three class days of the absence. To make sure that you are going to arrive to class on time you can set your watch here: http://www.time.gov/. Being late to class will result in a “late” for the day. Two “late” recordings will be made into an absence.
Students who miss class without approval of their instructor will receive a grade of zero on the missed assignment. Authorized absences must be approved by your instructor in advance of the absence, unless you have an emergency or illness. Make-up work must be completed outside of normal class hours within one week following an excused absence. It is your responsibility to see your instructor and make arrangements for make-up work if you have an excused absence.

Course Requirements
Exams
There will be three mid-term exams and a final, each covering a specific set of lecture, text, and homework material that will be communicated to the student in class. The final exam will be comprehensive to the material covered in the course. The tentative dates of these exams are listed in the course outline shown in this document. Students will have one week after each exam to review the exams and discuss the grades. No make-up exams will be given except in the case of an excused absence. An official written notice is required for an excused absence within three days of the exam. Any makeup exam must be taken within three days of the missed exam. The style of exam as well as allowed materials for the four exams will be communicated to the student in-class.

Homework Assignments
Homework will be assigned from the required text for the course. Homework assignments will be given to the student in class along with the due dates. When completing homework, the following guidelines must be followed:
1. Always restate the problem and draw a diagram if needed – make sure to label appropriately
2. Make sure to outline what values are given and the values you are trying to solve for
3. Use engineering style paper that is grid ruled, or equivalent electronic version
4. Use only one side of the paper (typically the side facing you on the pad)
5. Include your name and page number on each page
6. Use a ruler to set up your diagrams or in drawing elements, or appropriate electronic equivalent
7. Show the progression of your solution, clearly identify appropriate units when necessary
8. Indicate final answers by placing a surrounding box, don’t forget the units!!
9. Scan your homework document clearly for submission through D2L
The above criteria, as well as accuracy of the information, will be used to grade your homework.

Accuracy of homework answers: McGraw-Hill Connect website, due dates to be posted
Process & completeness of homework answers: Scanned HW pages and submitted via D2L Dropbox

Homework Grade: 40% Accuracy 30% Process 30% Completeness

Treat this as if I am your client and you need to impress me with your engineering calculations. Homework due dates and times will be communicated to the student in class. No late homework will be accepted unless you have an excused absence.

In Class Assignments and Presentations
All in class assignments must be completed by the end of the class period. This may include working out example or homework problems on the board or separate assignments given throughout the class. The student may also be asked to present completed homework to the rest of the class in a “flipped class” manner. This is done to assess the communication and presentation skills of the student. The grade for these assignments and participation will be averaged with the homework to give 25% of your final grade. It is the discretion of the instructor to grant additional time if deemed necessary.
Pre-Lecture Assignments
Students will be tasked to complete reading assignments using LearnSmart on the McGraw-Hill Connect website (see URL below). Each reading assignment will be posted well before the lecture in which the material is covered. It is the responsibility of the student to complete these reading assignments BEFORE the appropriate class. The grades for these assignments are based only on completion. Keep in mind that the quickest way to complete these assignments (~10-20 min) is to read the sections of the text first. For more information: http://connect.mheducation.com/class/c-aul-fall-2018

Email Communication
All official course communication will be made using your SFA email account. You must use your SFA email account for all communications. You will be notified via your SFA email account about grades and attendance. You can look up your SFA email account or setup email forwarding using this link: http://www.sfasu.edu/mysfa/o365/forwarding-email/
It is important to practice good email communications in college courses. Use "EGR 250" in the subject of your email messages. Use complete sentences and capitalization when appropriate. The body of your email messages should begin with your instructor's name and end with your name.

Classroom Policies
For the benefit of your fellow students and your instructor, you are expected to practice common courtesy with regard to all course interactions. For example:

- Be considerate toward your classmates and instructor and arrive to class on time.
- Do not leave class early and do not rustle papers in preparation to leave before class is dismissed.
- Avoid classroom distractions. Be attentive in class: stay awake, do not read newspapers, etc.
- If you are late to class or must leave early please inform your instructor in advance (enter or leave quietly, don't walk across the front of the classroom (use the side aisles) and don't walk in front of the projector).
- Cell phones, pagers and other communication devices must be turned off during class.
- Play well with others. Be kind and respectful to your fellow students and your teachers.

Academic Integrity (A-9.1)
Collaboration on examinations, in class assignments, and homework assignments is forbidden except where specifically specified as "Team" activities. For example, homework assignments can be worked on as a team but must be completed separately. In general, one team may not collaborate with another team on "Team" activities. Students violating this policy will be subject to procedures described in the Stephen F. Austin State University Policies and Procedures Manual.

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp
Withheld Grades Semester Grades Policy (A-54)
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

Students with Disabilities
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

Program Learning Outcomes
These are consistent with the “Student Outcomes” earlier in the syllabus document.

Student Learning Outcomes
These are consistent with the “Course Learning Outcomes” earlier in the syllabus document.

General Education Core Curriculum Objectives/Outcomes (EEO)
This course is not included in the general education core curriculum. Therefore, please see the learning outcomes above rather than any Exemplary Educational Objectives (EEOs).
EGR/PHY 250 – Engineering Statics Class Schedule

Course schedule is **tentative** and subject to change depending on pace of the class. Homework will be assigned based on material covered in class and in the assigned reading. Homework and due dates will be given in class.

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>1</td>
<td>8/27/2018 Introduction, Fundamentals Lab Session from 2:00-4:50pm</td>
<td>1.1-1.3</td>
</tr>
<tr>
<td>W</td>
<td>2</td>
<td>8/29/2018 Units, Problem Solving Methods</td>
<td>1.3-1.6</td>
</tr>
<tr>
<td>F</td>
<td>3</td>
<td>8/31/2018 Addition of Planar Forces</td>
<td>2.1</td>
</tr>
<tr>
<td>M</td>
<td>4</td>
<td>9/3/2018 Adding Forces by Components Lab Session, 2:00-4:50pm</td>
<td>2.2</td>
</tr>
<tr>
<td>W</td>
<td>5</td>
<td>9/5/2018 Forces and Equilibrium in a Plane</td>
<td>2.3</td>
</tr>
<tr>
<td>M</td>
<td>6</td>
<td>9/7/2018 Adding Forces in Space</td>
<td>2.4</td>
</tr>
<tr>
<td>M</td>
<td>7</td>
<td>9/10/2018 Forces and Moments Lab Session, 2:00-4:50pm</td>
<td>3.1</td>
</tr>
<tr>
<td>W</td>
<td>8</td>
<td>9/12/2018 Forces and Moments (cont.)</td>
<td>3.1</td>
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<tr>
<td>F</td>
<td>9</td>
<td>9/14/2018 Moment of a Force about an Axis</td>
<td>3.2</td>
</tr>
<tr>
<td>M</td>
<td>10</td>
<td>9/17/2018 Moment of a Force about an Axis (cont.) Lab Session, 2:00-4:50pm</td>
<td>3.2</td>
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<tr>
<td>W</td>
<td>11</td>
<td>9/19/2018 Couples and Force-Couple Systems</td>
<td>3.3</td>
</tr>
<tr>
<td>F</td>
<td>12</td>
<td>9/21/2018 Simplifying Systems of Forces</td>
<td>3.4</td>
</tr>
<tr>
<td>M</td>
<td>13</td>
<td>9/24/2018 Equilibrium of Rigid Bodies Lab Session, 2:00-4:50pm</td>
<td>4.1</td>
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<tr>
<td>W</td>
<td>14</td>
<td>9/26/2018 Two Special Cases (Equilibrium)</td>
<td>4.2</td>
</tr>
<tr>
<td>F</td>
<td>15</td>
<td>9/28/2018 Equilibrium in Three Dimensions</td>
<td>4.3</td>
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<tr>
<td>M</td>
<td>16</td>
<td>10/1/2018 Chapter 4 spread into this day</td>
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<tr>
<td></td>
<td>10/1/2018</td>
<td><strong>EXAM 1: CH 1-3, at 2:00-4:50pm</strong></td>
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<tr>
<td>W</td>
<td>17</td>
<td>10/3/2018 Planar Centers of Gravity and Centroids (cont.)</td>
<td>5.1</td>
</tr>
<tr>
<td>F</td>
<td>18</td>
<td>10/5/2018 Planar Centers of Gravity and Centroids (cont.)</td>
<td>5.1</td>
</tr>
<tr>
<td>M</td>
<td>19</td>
<td>10/8/2018 Further Considerations of Centroids Lab Session, 2:00-4:50pm</td>
<td>5.2</td>
</tr>
<tr>
<td>W</td>
<td>20</td>
<td>10/10/2018 Additional Applications of Centroids</td>
<td>5.3</td>
</tr>
<tr>
<td>F</td>
<td>21</td>
<td>10/12/2018 Additional Applications of Centroids (cont.)</td>
<td>5.3</td>
</tr>
<tr>
<td>M</td>
<td>22</td>
<td>10/15/2018 Analysis of Trusses Lab Session, 2:00-4:50pm</td>
<td>6.1</td>
</tr>
<tr>
<td>W</td>
<td>23</td>
<td>10/17/2018 Analysis of Trusses (cont.)</td>
<td>6.1</td>
</tr>
<tr>
<td>F</td>
<td>24</td>
<td>10/19/2018 Other Truss Analyses</td>
<td>6.2</td>
</tr>
<tr>
<td>M</td>
<td>25</td>
<td>10/22/2018 Other Truss Analyses (cont.)</td>
<td>6.2</td>
</tr>
<tr>
<td></td>
<td>10/22/2018</td>
<td><strong>EXAM 2: CH 4 &amp; 5, at 2:00-4:50pm</strong></td>
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</tr>
<tr>
<td>W</td>
<td>26</td>
<td>10/24/2018 Frames</td>
<td>6.3</td>
</tr>
<tr>
<td>F</td>
<td>27</td>
<td>10/26/2018 Frames (cont.)</td>
<td>6.3</td>
</tr>
<tr>
<td>M</td>
<td>28</td>
<td>10/29/2018 Internal Forces in Members Lab Session, 2:00-4:50pm</td>
<td>7.1</td>
</tr>
<tr>
<td>W</td>
<td>29</td>
<td>10/31/2018 Internal Forces in Members (cont.)</td>
<td>7.1</td>
</tr>
<tr>
<td>F</td>
<td>30</td>
<td>11/2/2018 Beams</td>
<td>7.2</td>
</tr>
<tr>
<td>M</td>
<td>31</td>
<td>11/5/2018 Beams (cont.) Lab Session, 2:00-4:50pm</td>
<td>7.2</td>
</tr>
<tr>
<td>W</td>
<td>32</td>
<td>11/7/2018 Beams (cont.)</td>
<td>7.2</td>
</tr>
<tr>
<td>F</td>
<td>33</td>
<td>11/9/2018 Laws of Dry Friction</td>
<td>8.1</td>
</tr>
<tr>
<td>M</td>
<td>34</td>
<td>11/12/2018 Laws of Dry Friction (cont.)</td>
<td>8.1</td>
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<tr>
<td></td>
<td>11/12/2018</td>
<td><strong>EXAM 3: CH 6 &amp; 7, at 2:00-4:50pm</strong></td>
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<tr>
<td>W</td>
<td>35</td>
<td>11/14/2018 The Laws of Dry Friction (cont.)</td>
<td>8.1</td>
</tr>
<tr>
<td>F</td>
<td>36</td>
<td>11/16/2018 Moments of Inertia of Areas</td>
<td>9.1</td>
</tr>
<tr>
<td>Class</td>
<td>Date</td>
<td>Topic</td>
<td>Reading</td>
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<tr>
<td>M</td>
<td>11/19/2018</td>
<td>Thanksgiving Holiday - No Class</td>
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<tr>
<td>W</td>
<td>11/21/2018</td>
<td>Thanksgiving Holiday - No Class</td>
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<td>F</td>
<td>11/23/2018</td>
<td>Thanksgiving Holiday - No Class</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>11/26/2018</td>
<td>Moments of Inertia of Areas (cont.) Lab Session, 2:00-4:50pm</td>
<td>9.1</td>
</tr>
<tr>
<td>W</td>
<td>11/28/2018</td>
<td>Parallel-Axis Theorem and Composite Areas</td>
<td>9.2</td>
</tr>
<tr>
<td>F</td>
<td>11/30/2018</td>
<td>Parallel-Axis Theorem and Composite Areas (cont.)</td>
<td>9.2</td>
</tr>
<tr>
<td>M</td>
<td>12/3/2018</td>
<td>The Basic Method (Virtual Work) Lab Session, 2:00-4:50pm</td>
<td>10.1</td>
</tr>
<tr>
<td>W</td>
<td>12/5/2018</td>
<td>The Basic Method (Virtual Work)</td>
<td>10.1</td>
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<tr>
<td>F</td>
<td>12/7/2018</td>
<td>Review</td>
<td></td>
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<tr>
<td></td>
<td>12/12/2018</td>
<td>Final Exam, Comprehensive, 10:30am-12:30pm</td>
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</tbody>
</table>
How to register for connect:

First log on to D2l via d2l.sfasu.edu and select your Engineering Statics course **CONTENT**:

![D2l screenshot showing Content selected](image1)

Then select the McGraw-Hill Connect DI link in the table of contents:

![McGraw-Hill Connect DI link](image2)

Then select the "Go to my Connect section":

![Go to my Connect section](image3)
This will take you to the connect portal, to continue you will need to enter your **SFA email address**.

If you do not have a Connect account, you will be prompted to create an account.

Use your **SFA email address** when creating an account and be sure to use the **name on your ID** to be paired with my grading system – this way I will be able to get your homework graded correctly.
You have three registration options.

1. **Connect Code**: Enter Connect access code and click **Redeem**.
2. **Purchase Online**: Click **Buy It** to use a credit card or PayPal.
3. **Temporary Access**: Click **Access Now** for two-week access.

**Connect prices through McGraw-Hill:**

**Connect access to text, required:**
- 180 Days is $100
- 360 Days is $130

**Connect & loose-leaf copy of text, 1 year is $157**
You have successfully joined the class. Click Go To Connect.

Need Help?
Tech Support & FAQ
Call: (800) 331-5094
Email & Chat: mhhe.com/support
Monday–Thursday: 24 hours
   Friday: 12 a.m. – 9 p.m. EST
   Saturday: 10 a.m. – 8 p.m. EST
   Sunday: 12 p.m. – 12 a.m. EST