



Statics ENGR 3350

UIW- Heidelberg Study Center

Physical Address:

Heidelberg, Germany - Bergstrasse 106, 69121

Instructor: Dr. Javier Arjona

Term: Summer I

Course Description

Statics is a course that studies the effects of forces on bodies and structures. It includes vector algebra, force systems, and free body diagrams. It also includes particle equilibrium, centroids, and moments of inertia.

Prerequisites: PHYS 2305 Physics I with a grade of "C" or better.

I. Course Objectives & Assessments

By the end of the semester, students should be able to:

- Understand the principles of Vector Algebra
- Understand the principles of Equilibrium of a particle
- Understand the principles of Systems of forces
- Understand the principles of Equilibrium of a rigid body
- Understand the principles of Structures
- Understand the principles of Friction
- Understand the principles of Center of gravity and centroid
- Understand the principles of Moments of inertia
- Enhance student problem solving skills

The course learning outcomes primarily address the following Engineering Program Outcomes:

- Students shall apply knowledge of mathematics and science to solve problems
- Students shall have an ability to conduct experiments, analyze data, and interpret results
- Students shall have fundamental system design skills
- Students shall have the ability to apply fundamental engineering science to technical problem solving

II. Course Texts/Supplies/Materials

Engineering Mechanics Statics, 14th Edition, R.C. Hibbeler, Prentice Hall, 2016.

- III. The following matrix reflects the general guideline of topics, readings, and/or assignments for each session. **The instructor reserves the right to modify weekly activities, assignments, projects, and/or assessments required for this class. Adjustments and/or changes will be stated before and/or during class. If the student is absent, it is the student's responsibility to contact the instructor and/or classmates about any adjustments and/or updates.**

Date	Topic	Reading	Class Activity
May/June			
	1. Vectors 1.1. Definitions 1.2. Scalars and vectors 1.3. Vector Operations 1.4. Vector addition of forces 1.5. Cartesian vectors 1.6. Applications 2. Equilibrium of a particle 2.1. Conditions for equilibrium 2.2. The free body diagram 2.3. Three dimensional force systems	As assigned	Discussions, written assignment, in-class participatory activities. - Homework Assigned
	3. Force system resultants 3.1. Moment of a force 3.2. Moment of a force about an axis 3.3. Moment of a couple 3.4. Simplification of a force and moment system 3.5. Distributed loading 4. Equilibrium of a rigid body 4.1. Conditions for equilibrium 4.2. Free body diagrams 4.3. Two and three-force	As assigned	Discussions, written assignment, in-class participatory activities. - Homework Assigned

	<p>members</p> <p>4.4. Equations of equilibrium</p>		
	<p>5. Structural analysis</p> <p>5.1. Simple trusses</p> <p>5.2. The method of joints</p> <p>5.3. Zero-force members</p> <p>5.4. The method of sections</p> <p>6. Friction</p> <p>6.1. Dry friction</p> <p>6.2. Problems involving friction</p>	As assigned	<p>Discussions, written assignment, in-class participatory activities.</p> <p>- Mid-term Exam</p> <p>- Homework Assigned</p>
	<p>7. Center of gravity and centroid</p> <p>7.1. Definitions</p> <p>7.2. General bodies</p> <p>7.3. Composite bodies</p> <p>7.4. Theorems of Pappus and Guldinus</p>	As assigned	<p>Discussions, written assignment, in-class participatory activities.</p> <p>- Homework Assigned</p>
	<p>8. Moments of Inertia</p> <p>8.1. Moment of inertia of area</p> <p>8.2. Parallel axis theorem for areas</p> <p>8.3. Radius of gyration</p> <p>8.4. Composite areas</p> <p>8.5. Mass moment of inertia</p> <p>8.6. Parallel axis theorem for masses</p>	As assigned	<p>- Final Exam</p>



NOTE: The instructor reserves the right to adjust and/or change the above schedule at any time during the semester. Adjustments and/or changes will be stated before and/or during class. If the student is absent, it is the student's responsibility to contact the instructor and/or classmates about any adjustments and/or updates.

IV. Grading Activities, Criteria and Guidelines

This class will include a variety of instructional methods and learning activities intended to engage the student in the learning process. This may include, but not be limited to: lecture, written assignments, group discussion and problem solving exercises, media presentation, article and case analysis, student-led discussion, student presentation, reflection on what was learned and documentation of planned application. Some assignments will be individual while some may be group or team assignments. Class will be participative, and each student must be prepared for each class.

V. Grades

The course consists of the following assessments. The instructor reserves the right to adjust and/or change the course assessments before and/or during the class.

Description	Percentage
Homework/Quizzes	25%
Mid-term Exam	25%
Participation / In-class activities	25%
Final Exam	25%
Total	100%

VI. Attendance and Participation

Attendance and active classroom participation are required of each student. Tests will cover for all course material provided through lectures and presentations, readings, discussions, cases, and videos during class. **Absences and/or a lack of participation in discussions will impact negatively on the final grade.** Each student is responsible for all material covered and/or assigned and any announcements made in any class session, whether student is present or not. Group activities require all students to participate and contribute to group discussions and projects.

Students are expected to come to class on time and to have read assigned material before class. There may be an occasional pop quiz to verify whether students have read the assignments before class. **All work must be turned in on time.** Late work may be accepted but



points will be taken off if work is not turned in to instructor when it is due. At all times, in class and group discussions, students are expected to respect contributions, questions, and opinions of other people. Demeaning others in any way is not acceptable.

VII. Academic Integrity Policy

Examples of scholastic dishonesty include, but are not limited to, plagiarism, cheating on assignments or tests, taking, unauthorized reuse of work, etc. If it is determined that a student has engaged in scholastic dishonesty, the faculty shall adhere to the [Academic Integrity Policy stated in the UIW Catalog](#).

X. Grading Scale

The University of the Incarnate Word operates on a semester basis using a 4-point grading scale as follows. Registrar Online Resource: <https://my.uiw.edu/registrar/academics/grading-scale.html>.

Grade	Descriptive Grade	Numeric Grade	Grade Points
A	Excellent Scholarship	93-100	4.00
A-	Excellent Scholarship	90-92	3.70
B+	Good Scholarship	87-89	3.30
B	Good Scholarship	83-86	3.00
B-	Good Scholarship	80-82	2.70
C+	Satisfactory Scholarship	77-79	2.30
C	Satisfactory Scholarship	70-76	2.00
D+	Poor Scholarship	67-69	1.30
D	Poor Scholarship	63-66	1.00
D-	Poor Scholarship	60-62	0.70
F	Failure	Less than 60	0.00
IP	Incomplete work		None assigned; converts to an F after expiration date or deadline of six months
N	Grade not reported by faculty		None assigned
NG	No grade required		None assigned; used for thesis and dissertation courses
P	Satisfactory Scholarship	70-100	None assigned
S	Satisfactory Scholarship	70-100	None assigned
W	Withdrawn from the University		None assigned



XI. Course Add/Drop Procedure

Students are responsible for communicating and updating any potential changes, including dropping a course, to the UIW Heidelberg Academic Director and their Academic advisor at UIW before implementing any changes.

Dropping or changing a course may delay a student's intended graduation date due to classes not adhering to their degree plan.

The Study Abroad Advisor, UIW European Liaison and/or any other administrative personnel are not responsible for the student's academic planning.

SUPPLEMENTAL COURSE INFORMATION

Class Policies:

1. The professor does not assign extra credit or have make-up exams or quizzes.
2. There are no make ups for missed in-class assignments due to either excused or unexcused absences.
3. It is the student's responsibility to review their grade on all homework, papers, and exams on a weekly basis. All grades are "final" a week after the homework, paper, or exam has been returned. Therefore, if you have a question or issue regarding your grade, it is your responsibility to schedule a time to visit with the professor immediately.