

BME 120: Introduction to Computer Aided Engineering Design

Lecture: T R 11:00 a.m. – 12:00 p.m.

Lab Section 01 : T 5:00 – 8:00 p.m.; Lab Section 02: R 3:00 – 6:00 p.m.

Course description: This course introduces students to the modern computational tools used for engineering design and analysis. Topics include: the principles of SolidWorks, simple and advanced part modeling approaches, assembly modeling, drawing, configurations/design tables and surface modeling, the applications of SolidWorks in manufacturing processes, mechanical systems, and engineering analysis.

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Office hrs: Tues 1:00 - 3:00 p.m.; Thursday 11:00 a.m. – noon; also by appointment.

Textbooks (required):

Engineering Graphics Essentials by K. Plantenberg, (5th ed), SDC publications. Textbook should either (a) be NEW or (b) have no pages torn out and no writing/drawing on exercises.

Engineering & Computer Graphics Workbook Using Solidworks 2018 by Barr, Juricic, and Krueger.

Other Required supplies (to be brought to every class):

- Gridded paper, pencil, eraser, and ruler that has inches AND millimeters.
- A removable media storage device, such as a USB flash drive, or access to cloud storage.

Course Web page: Most of the necessary course documents (syllabus, homework assignments, solutions, etc.) will be posted on D2L. Remote access to Solidworks is available at <http://ramcloud.wcupa.edu>.

Grading:

Quizzes (3X): 60% total

Homework: 20%

Final Project: 20%

COURSE STUDENT LEARNING OUTCOMES:

Upon completion of this course, students will be able to:	As measured by:
1. Interpret and create orthographic projections.	Semester Exams Homework Assignments
2. Understand the principles of dimensioning and geometric tolerancing, and apply these principles to interpreting and creating professional engineering drawings.	Semester Exams Homework Assignments
3. Create three-dimensional models and assemblies using computer software.	Semester Exams Homework Assignments Final Project

4. Understand the role that threads and fasteners play in engineering and interpret fastener definitions and thread tables.	Semester Exams Homework Assignments
5. Understand the process of reverse engineering and work collaboratively to apply this process to commercially engineered components.	Final Project

Program Goals / ABET Student Outcomes:

This course will contribute to developing the following program goals / ABET student outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics, economic, environmental, and societal contexts

Attendance: Since the course builds on previous material, attendance is crucial. Attendance will be taken at each lecture and lab. If you are not there for the *entire* lecture and lab, you will be marked absent. One unexcused lecture absence and one unexcused lab absence are allowed. After this, the instructor reserves the right to have each additional unexcused absence result in your course grade going down 1/3 of a letter grade (e.g., B to B-) down a minimum grade of D. Excused absences are limited to those due to participation in university sanction events (see policy in the WCU undergraduate catalog) or those accompanied by written confirmation from a doctor, the Dean of Students, etc. An unexcused absence on the day of a quiz or exam will result of a grade of zero for that quiz or exam. Finally, whether your absence is excused or unexcused (or if you are late to class), you will be responsible for any material covered and any announcements that were made in class that day. More details are contained in the WCU Undergraduate Catalog.

Homework: Homework will be assigned weekly. Homework assignments are due at the beginning of class on the specified due date. Assignments may consist of detailed hand sketches, computer exercises, or a design topic. Because of the unique structure of this class, no late assignments will be accepted unless you have already made a prior arrangement with me.

Course Coverage and Schedule (might be revised as the semester progresses):

	Lecture	Lab
Week 1	Intro, line types, sketching ortho projection,	Sketching ortho projection & line types
Week 2	Quick review Ortho Projection & dimensioning standards	Orthographic projection & dimensioning standards
Week 3	Sketching section views & CAD SW Unit 1a & 1b.	Sketching Section views & SW Unit #1a. HW on sections and intro do SW due Monday.
Week 4	Review hw on section views/SW Unit 1a. Introduce SW Unit 2 (1b not necessary).	Review HW on sections and Unit #1a. SW Unit 1b, SW Unit 2.
Week 5	Quiz 1 (hand sketching & dimensions)	SW Unit #3 & Start Unit #4

Week 6	Review Quiz. Introduce CAD Unit #5 & 6	Finish CAD Unit #4, do Unit #5, start Unit #6
Week 7	Introduce CAD Units #7	Finish CAD Unit #6 & Unit #7 (including loft). HW due Monday.
Week 8	Review HW. Introduce CAD 3D sketch and Projects.	Quiz #2 (up to and including sweep & left). Short lab on 3D sketch.
Week 9	Threads & Fasteners, Introduce CAD sweep	Threads & Fasteners, CAD on sweep, projects if time.
Week 10	Introduce CAD assemblies	Lab assemblies, projects
Week 11	Introduce CAD Part drawings #1 & 2	CAD Part drawings #1 & start #2
Week 12	Introduce CAD assembly	Finish CAD Part drawings #2. Projects. HW due Monday.
Week 13	SW CAD Assembly drawings & projects	Quiz #3 (threads & fasteners, advanced CAD , drawings, assemblies)). Lab on SW CAD Assembly drawings
Week 14	Lecture on FEA.	Short FEA tutorial. Projects

Students with Disabilities: If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University's [Services for Students with Disabilities](#) (OSSD), please contact the OSSD which is located at 223 Lawrence Center. The OSSD hours of Operation are Monday – Friday 8:30 a.m. – 4:00 p.m. Their phone number is 610-436-2564, their fax number is 610-436-2600, and their email address is ossd@wcupa.edu. See the following website for more information: <http://www.wcupa.edu/ussss/ossd/default.aspx>.

Academic & Personal Integrity: It is the responsibility of each student to adhere to the university's standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another's work and/or using ideas of another and presenting them as one's own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to the Department Undergraduate Handbook, the Undergraduate Catalog, the *Ram's Eye View*, and the University website at www.wcupa.edu.

E-Mail and Communication: It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor,

will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.

Intellectual Property Statement: The instructor for this course utilizes copyrighted materials under the "Freedom and Innovation Revitalizing United States Entrepreneurship Act of 2007" (Fair Use Act). Apart from such copyrighted materials, all other intellectual property associated with this course is owned and copyright protected by the instructor, including, but not limited to, lectures, course discussions, course notes and supplementary materials posted or provided to students authored by the instructor, assessment instruments such as quizzes and exams, and Power Point presentations. No recording, copying, storage in a retrieval system, or dissemination in any form, whether electronic or other format, by any means of the intellectual property of the instructor, either in whole or in part, is permitted without the prior written permission of the instructor. When such permission is granted, it must specify the utilization of the intellectual property and all such permissions and waivers shall terminate on the last day of finals in the semester in which this course is held.

Links and references to on-line resources provided by the instructor may lead to other sites. The instructor does not sponsor, endorse or otherwise approve of any information appearing in those sites, nor is responsible for the availability of, or the content located on or through, external sites. Apart from materials used in accordance with the Fair Use Act, the instructor takes no responsibility for material that is otherwise offered at web sites and makes no warranty that such material does not infringe any third party rights. However, should any of this type of material be present and this fact is brought to the attention of the instructor, they will remove references to it from course materials.

Emergency Preparedness: All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information and to sign up, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.

Reporting Incidents of Sexual Violence: West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator, Ms. Lynn Klingensmith. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at the webpage for the Office of Social Equity at <http://www.wcupa.edu/admin/social.equity/>.