

## **BME 120: Introduction to Computer Aided Engineering Design**

**Spring 2021**

**Lecture: Tues. 1:00 p.m. – 2:00 p.m.**

**Lab Section 51: Tues. 5:00 – 8:00 p.m. Lab Section 52: Thur. 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.

**COVID-19 Statement:** Part of West Chester University's response to the COVID-19 pandemic was to switch the vast majority of instruction to remote. This decision was made out of an abundance of caution to protect the health of all members of the WCU community. Faculty have been asked to make every effort to adapt their courses to this novel situation while still meeting the critical learning outcomes of the course. Students are asked to discuss any problems with the new course format and schedule directly with their instructors. Patience and flexibility on everyone's behalf are critical to our community's navigation of this public health crisis. For this particular course, the regularly scheduled meetings will be facilitated using Zoom

**Instructor: Prof. Robert Thornton**

Office: Merion 129

Office Phone: 610-436-2614

E-mail: rthornton@wcupa.edu

Office hrs (signup via Calendly): <https://calendly.com/prof-rthorntonjr> Mon 3:00 – 4:00 p.m.;

Wednesday 12:00 – 2:00 p.m.; Friday 2:00 – 3:00 p.m.; also by appointment.

**Textbooks (required):**

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

*Design Workbook Using Solidworks 2020* by Barr, Juricic, Krueger, and Reyes.

**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>.

**Assesment:**

Attendance & Participation: 5%

Homework: 20%

Test 1: 25% total

Test 2: 25% total

Final Exam: 25%

## COURSE STUDENT LEARNING OUTCOMES:

Upon completion of this course, students will be able to:	As measured by:
1. Interpret and create orthographic projections, both by hand and via computer software.	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

## 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 and since lecture/lab is only once a week, attendance is crucial. Attendance will be taken via Zoom records 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 approximately once per week. Assignments are due at the specified time and date on D2L. Late assignments will result in a reduction in points. Assignments handed in after they are reviewed in class (which will be very soon after they are due) will receive no credit. Assignments may consist of detailed hand sketches, computer exercises, or a design topic.

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

Week #	Lecture date	Topic
1	Jan 26	Orthographic projection
2	Feb 2	Orthographic projection & dimensioning standards
3	Feb 9	Dimensioning & Section views
4	Feb 16	Introduce Solidworks
5	Feb 23	Test #1 & more Solidworks intro parts
6	March 2	Solidworks patterns, offset, mirroring, etc.
7	March 9	Solidworks 3D Modeling Part I
8	March 16	SPRING BREAK
9	March 23	Threads, fasteners, advanced features in Solidworks
10	March 30	Assemblies
11	April 6	Test #2 & part drawings
12	April 13	Part drawings
13	April 20	Assembly drawings
14	April 27	Animations & Simulations
15	May 4	Review

**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](mailto: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](http://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](http://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/](http://www.wcupa.edu/_admin/social.equity/).