ME357 A1 Introduction to CAD and Machine Components (Spring 2024)   Information   Edit Mode is: • **ON**

Information

Build Content   **Assessments**   **Tools**   **Partner Content**

Class Information - Spring 2024

Time	• Section A1 (Tuesday) 6:30-8:15 • Section A2 (Thursday) 6:30-8:15
Location	• Engineering Computational Lab (ECL) 15 St. Mary's Street, EMB 125
Schedule	• Blackboard Calendar
Zoom Links	• Listed in Blackboard under Zoom Meetings when applicable
Professor	• Scott Morris (semorris@bu.edu)
Office hours	• Tuesday & Thursday after class and by appointment
Book	• Not required

Software	• Solidworks 2023 Software
	  ○ Access via ME Computer Lab (EMB125)
	  ○ Access via Installation on personal computer
	  ○ Access via CITRIX on personal computer

Hardware	• Personal Computer • Three button mouse with scroll wheel ○ Link to example

Labs

ME357 Consists of a scheduled classroom component and an "optional" lab component

- Labs are hosted by two learning assistants in EMB125
- Labs provide additional support or answers to specific questions about tutorials and projects
- Students can attend any lab session and attend mulitple lab sessions
- Labs provide the best way to get hands on support from your peers and subject matter experts
- No attendance is taken and students are not required to attend labs
  - it the software capabilities and assignments are understood, work can be completed independently

	Sunday
Time	12:00-2:00
LAs	Sarah and Paul
Locatio n	EMB125

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Learning Assistant Team

Section A1 - Tuesday	Section A2 - Thursday
Paul Ferrer	Sarah Koesema
pferrerf@bu.edu	skoesema@bu.edu

Top Hat

ME357 will use the Top Hat platform for attendance and class work

If you do not already have a license of Top Hat, you can get the details here
https://tophat.com/pricing/

Join piazza

ME357 will use the piazza platform for all class Q&A

Use this link to join the ME357 Intro to CAD piazza class
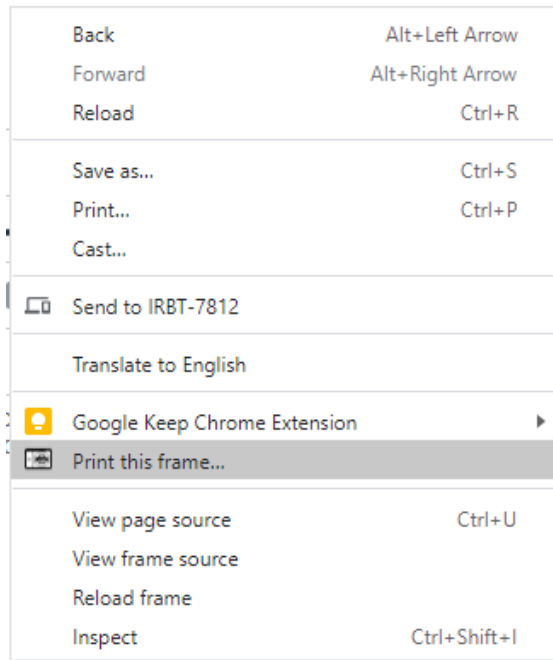
Technical Support

If you are experiencing technical issues with the BU network, VPN, network shares, CITRIX, Blackboard or anything else related to technology required for ME357, please send your question to the Engineering IT team first

enghelp@bu.edu

How to Print Blackboard Pages?

Blackboard pages can be printed, but not with the standard File, Print or Ctrl-P actions. To print a full page, right click on the page and select Print this frame... from the context menu

Back	Alt+Left Arrow
Forward	Alt+Right Arrow
Reload	Ctrl+R
Save as...	Ctrl+S
Print...	Ctrl+P
Cast...	
📠 Send to IRBT-7812	
Translate to English	
💡 Google Keep Chrome Extension	▶
🖨 Print this frame...	
View page source	Ctrl+U
View frame source	
Reload frame	
Inspect	Ctrl+Shift+I

How to Print CAD Drawings

Printing CAD Drawings

Throughout the semester you may want to print paper copies of CAD drawings

- For personal use, printed drawings can be on any size paper
- If required for project or assignment, printed drawings should be no smaller than a B size (11x17") paper
- The BU print service, MyPrint, does not print B size paper.
  - Please do not tape together smaller pages to make a larger page for assignments or review in EPIC
- B sized Prints or larger can be printed at FedEx Office Print & Ship Center, Boston University, 115 Cummington Mall, Boston, MA 02215 US
  - https://local.fedex.com/ma/boston/office-5012/
  - B-size prints are self-serve and cost normal print charges (~0.50)
  - Larger prints take longer and are more costly (~$5)

Syllabus

Syllabus
DESCRIPTION & SUMMARY

Description

Focus on engineering modeling in 3D and technical drawing in 2D using advanced CAD tools. Hands-on course work will allow students to ideate and model mechanisms. Course will focus on design tools for subsequent classes and industrial best practices. Topics will include ideation, design of machine components, and introduction to design for prototyping, machining, manufacture, assembly and repair. 2 credits.

Prerequisites by topic: none

Summary of Course Topics

1. **Design Process**: ideation, concept selection and sketching

2. **Basic Part modeling in CAD**: setting up datum planes, defining the coordinate systems, feature selection, parent/child relationships, dimension driven 3D sketching (e.g. protrusions, revolving and fillets etc), and visualization (e.g. hidden lines, shaded, and perspective views)
3. **Complex Parts and Surfaces**: Curved surfaces and blends, shelled/molded parts, adding ribs and bosses, and apply threads to holes
4. **Detailing and Blueprint Creation**: Orthographic projections, line and text forms, coordinate dimensioning and tolerancing principles and standards, geometric dimensioning and tolerancing (GD&T), section and part-section views, compliance with ANSI and ISO standards
5. **Assembly**: Assembly constraints (e.g. mating planes and coordinates, aligning, orienting etc), exploded views, creating a Bill of Materials (BOM), interference and clearance checking, and orthographic assembly drawings
6. **Engineering Documentation**: export/import of files, rendering, document control, and drawing printing
7. **Introduction to Kinematics**: Mechanism Analysis using CAD (e.g. angular position and velocity plots) and creating animations
8. **Introduction of Design for X**: Connection between design and prototyping, machining, manufacture, assembly and repair using BOM for costing analysis of a mechanism.

LEARNING OBJECTIVES & PRINTING

Course Goal

- Develop the ability to create three-dimensional engineering models and two-dimensional drawings using CAD
- Use dimensioning and tolerancing techniques to create manufacturable parts
- Conduct motion analysis of a mechanism
- Understand the connections between CAD design with prototyping, machining, manufacture, assembly, and repair

Course Learning Outcomes

Upon completing this course, students will be able to:

- Convey ideas through sketches and other graphical means
- Create and analyze solutions to design problems in accordance to professional standards
- Create two dimensional drawings incorporating basic conventions of geometric dimensioning and tolerancing of components and mechanisms using CAD
- Create three dimensional models of components and mechanisms using CAD
- Conduct a motion analysis of a mechanism
- Understand CAD practices that facilitate iteration and change
- Document and communicate a design process in written and oral form

ASSESSMENT & ASSIGNMENTS

Course Assessment

Weighting

- Attendance 10%
  - All attendance will be recorded online in Top Hat
- Quizzes 40%
  - Single lowest grade will be dropped from average calculation
- Project Assignments 50%
  - No project grades will be dropped from average calculation

Grading Scale

- A = 94–100%
- A– = 90–93.99%
- B+ = 87–89.99%
- B = 84–86.99%
- B– = 80–83.99%
- C+ = 77–79.99%
- C = 74–76.99%
- C– = 70–73.99%
- D = 60–69.99%
- F = 0–59.99%

Project Assignments

- Multiple project assignments will be given, and details will be discussed as they are assigned
  - There will be (3) CAD model and drawing projects
  - There will be (5) components to the 4-Bar Linkage project

- All project details will be provided in Blackboard
- All assignments will be submitted in Blackboard
- All assignments will be graded in Blackboard
- Student solutions should be original; plagiarism will not be tolerated

Quizzes

- Given on Blackboard with the same deadline for all sections
  - Released on Monday morning of the week they are due
  - Must be submitted by Sunday at midnight for full credit
- Submitted electronically using Blackboard
- Offer two attempts
- Only the latest submission will be graded
- Lowest score will be dropped from the average calculated in Blackboard
- Some quizzes may require the submission of an image file, CAD file or PDF file
  - Pay attention to the requested file types and submit the proper file formats for full credit

Class Participation

- Class participation is based on each student's professional, active and constructive participation in the solution of the example problems in class, responses to general questions and your regular attendance of the class lectures. Remote students can show their attendance by actively participating in online sessions and piazza.
- You MUST act in a professional manner to all students while in the classroom and for all group projects. Class discussions can be passionate and opinionated, but should never make other students feel poorly. Bullying or belittling will not be tolerated. Attack the idea, not the person. Being able to take and give criticism is a skill and it will be developed in this class.
- BU's academic Conduct Code: http://www.bu.edu/academics/policies/academic-conduct-code

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