# Information

<table>
<thead>
<tr>
<th>Build Content</th>
<th>Assessments</th>
<th>Tools</th>
<th>Partner Content</th>
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<tbody>
<tr>
<td><strong>Class Information - Fall 2022</strong></td>
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<tr>
<td><strong>Labs</strong></td>
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<td><strong>Learning Assistant Team</strong></td>
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<tr>
<td><strong>Top Hat</strong></td>
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<tr>
<td>ME357 will use the Top Hat platform for attendance and class work</td>
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<tr>
<td>If you do not already have a license of Top Hat, you can get the details here</td>
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<td><a href="https://tophat.com/pricing/">https://tophat.com/pricing/</a></td>
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<tr>
<td><strong>Join piazza</strong></td>
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<td>ME357 will use the piazza platform for all class Q&amp;A</td>
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<tr>
<td>Use this link to join the ME357 Intro to CAD piazza class</td>
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<td><strong>Technical Support</strong></td>
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<tr>
<td><strong>How to Print Blackboard Pages?</strong></td>
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Schedule

Build Content  Assessments  Tools  Partner Content

Quiz Schedule

Project Schedule

Course Schedule
This is the master schedule for ME357 containing a complete listing of all required coursework

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Classwork Topic</th>
<th>Tutorial Topic</th>
<th>Tutorial Thumbnail</th>
<th>Tutorial Length</th>
<th>Quiz Topic</th>
<th>Project Topic</th>
<th>Project Thumbnail</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5-SEP-2022</td>
<td>Introduction to Solidworks</td>
<td>• Introduction to Solidworks</td>
<td></td>
<td>60 minutes</td>
<td>Class Materials &amp; Solidworks Installation</td>
<td>No Project</td>
<td></td>
<td>11-SEP-2022</td>
</tr>
<tr>
<td>Week</td>
<td>Date</td>
<td>Classwork Topic</td>
<td>Tutorial Topic</td>
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| 2    | 12-SEP-2022| Extrude        | • Lesson 1: Parts  
• Fillets           | ![Lesson 1: Parts](image) | 75 minutes         | Extrude               | No Project          | ![Extrude](image)  | 18-SEP-2022    |
| 3    | 19-SEP-2022| Revolve        | • Revolve & Sweep  
• Patterning Features  
• Lesson 3: Drawing | ![Revolve & Sweeps](image) | 75 minutes         | Revolve               | CAM Model & Drawing Assigned | ![CAM](image) | 25-SEP-2022    |
| 4    | 26-SEP-2022| Drawing        | • Adv Drawings: Creating Drawing Views  
• Adv Drawings: Detailing | ![Advanced Drawings](image) | 60 minutes         | Part Drawing            | CAM Model & Drawing | ![CAM](image) | 02-OCT-2022    |
| 5    | 03-OCT-2022| Section View   | *Morris @ Conference - Labs Only* | ![Section View](image) | Part Section View  
Drawing               | BLOCK Model & Drawing Assigned | ![BLOCK](image) | 09-OCT-2022    |
| 6    | 10-OCT-2022| No Classes (Labs Only) - Indigenous People's Day | *No Quiz* | ![Sweeps](image) | 45 minutes         | Sweep & Pattern        | 4-Bar Linkage Assembly Assigned | ![Assembly](image) | 16-OCT-2022    |
| 7    | 17-OCT-2022| Sweep & Loft   | • Sweep  
• Loft            | ![Sweeps](image) | 45 minutes         | Sweep & Pattern        | 4-Bar Linkage Assembly Assigned | ![Assembly](image) | 23-OCT-2022    |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>8</td>
<td>24-OCT-22</td>
<td>Assembly</td>
<td>• Lesson 2: Assembly&lt;br&gt;• Assembly Mates&lt;br&gt;• Optional: Toolbox</td>
<td><img src="https://learn.bu.edu/ultra/courses/_86498_1/cl/thumbnail" alt="Thumbnail" /></td>
<td>60 minutes</td>
<td>Assembly Modeling</td>
<td>4-Bar Linkage Assembly</td>
<td><img src="https://learn.bu.edu/ultra/courses/_86498_1/cl/project_thumbnail" alt="Thumbnail" /></td>
<td>30-OCT-22</td>
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<tr>
<td>9</td>
<td>31-OCT-22</td>
<td>Assembly Drawing</td>
<td>• Adv Drawing: Assembly Drawing Views</td>
<td><img src="https://learn.bu.edu/ultra/courses/_86498_1/cl/thumbnail" alt="Thumbnail" /></td>
<td>30 minutes</td>
<td>Assembly Drawing</td>
<td>4-Bar Linkage Part Drawings</td>
<td><img src="https://learn.bu.edu/ultra/courses/_86498_1/cl/project_thumbnail" alt="Thumbnail" /></td>
<td>06-NOV-22</td>
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<tr>
<td>10</td>
<td>07-NOV-22</td>
<td>Exploded Assembly</td>
<td>• Review Engineering Drawing Content in Top Hat</td>
<td><img src="https://learn.bu.edu/ultra/courses/_86498_1/cl/thumbnail" alt="Thumbnail" /></td>
<td>30 minutes</td>
<td>Assembly Exploded View</td>
<td>4-Bar Linkage Assembly Drawing</td>
<td><img src="https://learn.bu.edu/ultra/courses/_86498_1/cl/project_thumbnail" alt="Thumbnail" /></td>
<td>13-NOV-22</td>
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<tr>
<td>11</td>
<td>14-NOV-22</td>
<td>Motion</td>
<td>• PhotoView 360 &amp; Appearances&lt;br&gt;• Motion&lt;br&gt;• Kinematics</td>
<td><img src="https://learn.bu.edu/ultra/courses/_86498_1/cl/thumbnail" alt="Thumbnail" /></td>
<td>30 minutes</td>
<td>Assembly Rendering</td>
<td>4-Bar Linkage Video</td>
<td><img src="https://learn.bu.edu/ultra/courses/_86498_1/cl/project_thumbnail" alt="Thumbnail" /></td>
<td>20-NOV-22</td>
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<td>12</td>
<td>21-NOV-22</td>
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<td><em>No Classes - Thanksgiving Break</em></td>
<td><img src="https://learn.bu.edu/ultra/courses/_86498_1/cl/project_thumbnail" alt="Thumbnail" /></td>
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<tr>
<td>13</td>
<td>28-NOV-2022</td>
<td>Trace Curve Output and Graphing</td>
<td>Kinematics</td>
<td>No Tutorial</td>
<td>Course Survey</td>
<td>4-Bar Linkage Motion Study</td>
<td></td>
<td>04-DEC-2022</td>
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<tr>
<td>14</td>
<td>05-DEC-2022</td>
<td>No Classwork</td>
<td>CAD in Industry</td>
<td>No Tutorial</td>
<td>No Quiz</td>
<td>CAP Model &amp; Drawing Assigned</td>
<td></td>
<td>11-DEC-2022</td>
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</table>
How to Print CAD Drawings

Syllabus

TITLE: ME357 A1/A2/A3/A4 Introduction to CAD and Kinematics

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
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

https://learn.bu.edu/ultra/courses/_86498_1/cl/outline
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
- Project Assignments 50%
  - No project grades will be dropped from average calculation
- Quizzes 40%
  - Single lowest grade 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](http://www.bu.edu/academics/policies/academic-conduct-code)

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