

Morgan State University  
Department of Industrial & Systems Engineering

**IEGR 317: Solid Modeling & Design**  
Fall 2022 Semester; 3 Credits; Lecture/Lab

**Catalog Description:**

Introduction of solid modeling and computer-aided design (CAD) for manufacturing. Students will be exposed to the rudiments of CAD and CAE (computer-aided engineering), and to their applications in the design of products. Extensive discussions on modeling and design to equip students with the state-of-the-art tools for product and systems design.

**Prerequisites:** IEGR 304 or Department's Approval

**Instructor:** Masud Salimian, PhD  
**Office Location:** SEB 318  
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**E-mail:** masud.salimian@morgan.edu  
**Website:** <https://salimian.webersedu.com/>  
**Office Hours:** Tue. 1-4 PM. Thu. 1-4 PM (In-office & Virtual), others by appointment  
**Website:** <http://salimian.webersedu.com/>

**Textbook:** Shih, Randy H., Parametric Modeling with Autodesk Fusion 360, SDC Publications, Kansas, 2022. ISBN-13: 978-1630574987 \ ISBN-10: 1630574988

**Software:** Autodesk Fusion 360 (Download from Autodesk)  
<https://www.autodesk.com/education/edu-software/overview?sorting=featured&filters=individual>

**Tutorials:** Lars Christensen YouTube channel (and other YouTube tutorials).  
<https://www.youtube.com/channel/UCo29kn3d9ziFUZGZ50VKvWA>

**Website:** <https://salimian.webersedu.com/courses/IEGR317/>

**Group:** IEGR317 (Access through Google Groups from MSU email)

**Meeting:** Tuesdays 5:30 – 8:15 PM SEB 307

**Presentation:** During Office Hours

**Recordings:** Shared Google drive

**Assessment:** Four categories: Assignments, Midterm Exam, Final Exam and Projects Presentations. Each contributing 25% to overall grade.

**Grading:** A: 90 and above; B: 80-89; C: 70-79; F: below 70

**Course Policy:**

All classes are conducted as face-to-face mode in SEB 307 lab. Students are expected to be present and actively engaged during the class time. All students are expected to conform to all University standards of conduct in accordance with the University Catalog. All work presented on examinations and quizzes must be of your own. Any deviation from this policy will be regarded as academic dishonesty and will be pursued through appropriate University recommended guidelines. Students are strongly recommended to comply with the requirements of the class including guidelines for work and exam submissions.

**Specific Goals for the Course:****a. Specific Outcomes of Instruction:**

1. Students will be able to understand the fundamentals of operating any 2-D CAD system through learning universal CAD commands.
2. Students will demonstrate knowledge of general 3-D development (Primitive, Wireframe Modeling, Surface Modeling, Parametric Solid Modeling)
3. Students will be able to represent a design idea as a three-dimensional object for visualization;
4. Students will be able to design a product using the basics of product design principles;
5. Students will be able to present the designed product as a solid model;
6. Students will be able to generate associated two-dimensional concepts and models from three-dimensional models and concepts;
7. Students will learn the skills of team-work, communication, visualization, documentation and presentation

**b. Relationship of Course Outcomes to ABET Student Outcomes**

1. Course Outcome supports ABET Outcomes 6a
2. Course Outcomes 2, 3 & 4 support ABET Outcomes 1, 6
3. Course Outcome 5 support ABET Outcomes 1, 6
4. Course Outcome 6 support ABET Outcomes 1, 3, 6
5. Course Outcome 7 support ABET Outcomes 1, 3, 5

**Topics Covered**

Weeks 1-2: Introduction to the class and software / Development of a model

Weeks 3-4: Continuation of software features and conversion of Fusion 360 solid models to 3-D printable files

Weeks 5-6: Continuation of software features and conversion of Fusion 360 solid models to CAM files

Weeks 7: Exam 1 (Midterm)

Weeks 8-9: Continuation of software features and engineering graphics standard prints

Weeks 10-13: Continuation of software features; advanced topics

Weeks 14: Exam 2 (Final)

Note that Week numbers refer to actual weeks that class meets, so if for any reason a class does not meet (breaks, emergency cancellations, etc.), the next class that meets is assigned the number.