

SIE 383
Integrated Manufacturing Systems
Spring 2021

Class hours: MW 3:00 – 4:15 p.m., ILC Room 150 (The plan is to be asynchronous this semester)

Instructor: Brian Cunningham

Email: bcunning@email.arizona.edu

Semester Office Hours: by appointment

Teaching Assistant: Celeste Williams

Tel: 480-440-5806

Email: celestewilliams@email.arizona.edu

TA Office hours via Zoom: F – 11AM

Meeting ID:890 3856 4235

Prerequisite(s):

1. Advanced Standing

Text:

Nanua Singh, *Systems Approach to Computer-Integrated Design and Manufacturing*, John Wiley & Sons, Inc., 1996.

Expected learning outcomes:

1. Understand basic primary and secondary manufacturing processes.
2. Understand integration of part design and manufacturing.
3. Understand concepts and experience tools for manufacturing.

Topics to be covered:

1. Basic manufacturing definitions, functions, and systems
2. Part design specification including Dimensioning & Tolerance
3. CAD systems
4. Materials and their properties
5. Casting and forming (metals, powders, ceramics, plastics)
6. Material removal processes
7. Tooling and fixturing design
8. Rapid-prototyping
9. Numerical control
10. Robotics
11. Lean manufacturing concepts
12. Process planning
13. Design for manufacturability and assembly

Grading:

1. Weekly Assignments 20%
2. Lab Projects: 20 %
3. Presentations: 20 %
4. Midterm Exam: 20 % (Date is TBD)
5. Final Exam: 20 % (May 11th, 3:30 p.m. – 5:30 p.m.)

Computer Usage:

1. Solidworks
2. NC part programming
3. Robot programming

Laboratory Projects:

1. CAD (3D) drawing (SolidWorks)
2. NC programming of mill (CNC)
3. Metrology
4. Robot programming and motion control
5. Processes Planning

Course Guidelines/Rules:

1. Lab projects need to be done individually unless otherwise mentioned. Group labs may be done in groups of up to 4 students. Each group should submit a single report with all names. The same group must be used throughout the semester.
2. Absences for any sincerely held religious belief, observance, or practice will be accommodated where reasonable, refer to the University Of Arizona policy at policy.arizona.edu/human-resources/religious-accommodation-policy.
3. Plagiarism is not allowed. Refer to the University Of Arizona policy at <https://deanofstudents.arizona.edu/policies/code-academic-integrity>.
4. Threatening behavior by students is not prohibited, refer to the University Of Arizona policy at <https://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.
5. It is the University's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let me know immediately so that we can discuss options. You are also welcome to contact Disability Resources (520-621-3268) to establish reasonable accommodations.
6. The information contained in the syllabus (except the grade and absence policies) may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.