

SIE 383
Integrated Manufacturing Systems
Spring 2022

Class hours: MW 3:00 – 4:15 p.m., Engineering, Room 214

Instructor: Brian Cunningham

Email: bcunning@email.arizona.edu

Office Hours: by appointment

Teaching Assistant: Celeste Williams

Tel: 480-440-5806

Email: celestewilliams@email.arizona.edu

TA Office hours via Zoom: Thursday – 11:30AM or by appointment

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. Assignments 10%
2. Lab Projects: 20 %
3. Presentations: 20 %
4. Midterm Exam: 25 % (Date is TBD)
5. Final Exam: 25 % (May 10th, 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 and assignments need to be done individually unless otherwise specified. Group labs and assignments may be done in groups of up to 4 students. Each group should submit a single document with all names. The same group must be used throughout the semester.
2. Students are expected to attend lectures and labs. Students not attending a lab session or arranging to make it up will receive a 0 for that assignment. Most assignments will be completed in class, if you are absent on the day of an assignment you will need to complete the assignment on your own and submit it via D2L by the given due date.
3. 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.
4. Plagiarism is not allowed. Refer to the University Of Arizona policy at <https://deanofstudents.arizona.edu/policies/code-academic-integrity>.
5. 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>.
6. 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.
7. 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.
8. If you have a legitimate reason that causes you to miss class on the day of an examination, you must contact the professor prior to the examination to make arrangements in advance. If you have an unexpected and extreme emergency, such as a serious illness or accident on the day of the exam, then you must contact the professor as soon as possible.
9. If you are sick or if you think you are sick don't come to class. Communicate with me as soon as possible.