



EMCH 377 Manufacturing

1 Course Information

Course Description

Basics of: Deformative Manufacturing, Subtractive Manufacturing, Additive Manufacturing, Assembly Processes; Introduction to: Polymers Manufacturing, Composites Manufacturing, Computer-Aided Manufacturing.

Pre-requisites: D or better in EMCH 371 Materials;

Co-requisites or Pre-requisites: None.

Required for BSE in Mechanical Engineering

Contact hours - 3

2 Instructor Information

Clint Saidy

Email: csaidy@mailbox.sc.edu

Office Location: McNAIR Center (1000 Catawba St., Suite 120)

Office Hours: MWF 12:00pm – 01:00pm or by appointment

3 Teaching Assistant/Grader

Ibrahim Yousif

Email: iyousif@email.sc.edu

Office Location: McNAIR Center (1000 Catawba St., Suite 120)

Office Hours: MF 11:00am – 12:00pm or by appointment

4 Textbook

Introduction to Advanced Manufacturing, Ramy Harik - Thorsten Wuest, ISBN of 978-0-7680-9327-8

5 Meeting Time/Location

Meeting Time

MWF | 9:40am – 10:30am

Meeting Location

Swearingen Engineering Center, 301 Main St. | **Room 1C01** (Face-to-Face Instructional Method)

6 Course Topics

1. Introduction to Manufacturing Processes
2. Deformative Manufacturing: Casting, Forging, Rolling, Extrusion
3. Subtractive Manufacturing: Milling, Turning, Drilling

4. Additive Manufacturing: Fused Filament Fabrication, Selective Laser Sintering, Stereolithography
5. Assembly Processes: Mechanical Joints, Fusion/Welding
6. Computer Aided Manufacturing: Numerical Chain, Process Planning, G-Code Generation
7. Polymers Manufacturing: Injection Molding, Blow Molding, Extrusion Molding
8. Composites Manufacturing: Hand Layup, Automated Fiber Placement

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Course Outcomes

1. Students will describe a variety of manufacturing processes, such as deformative (casting, forging, extrusion, rolling), additive (FFF, SL, SLS), subtractive (milling, turning, drilling) and assembly processes.
2. Students will use concepts from engineering materials, heat transfer, fluid mechanics and solid mechanics to estimated relevant process parameters.
3. Students will analyze causes of common manufacturing defects for process change recommendations to reduce defects.

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Lecture Schedule

The class is split into 4 cycles. The first three cycles cover chapters 1 through 6 from the textbook, and they represent the fundamentals of manufacturing. I have decided to cover in cycle 4 chapters 7 and 8, Polymers and Composites manufacturing, due to their relevance to the state of South Carolina. Students are invited to read chapters 9 and 10 on their own. Each potential lecture is followed by the corresponding section in the book.

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Grading Policy

Graded work will consist of homework (15%), 3 tests (50%), and final exam (35%). The overall grade will be assigned as follows:

90-100 A 85-89 B+ 80-84 B 75-79 C+ 70-74 C 60-69 D < 60 F

Homework (15%): Homework will determine 15% of your final average. Homework assignments are announced in the detailed plan. These assignments can also be found on Blackboard. Late homework will not be accepted. Students are encouraged to work together but copying is not allowed. Grade forgiveness for the lowest grade is available. The grade forgiveness can be used for out of town travel (job interview, sports participation, health care visit ...) or any emergency. Students will have their lowest homework grade automatically dropped.

Tests (50%): Three tests will be given during the semester. Tests will determine 50% of your final average. **The tests will begin promptly at 09:40 am and ends at 10:30 am.** If you arrive late you will not be given extra time to complete the test. Failure to attend a test results in the assignment of a zero for that test grade. Grade forgiveness for the lowest test grade is available. The grade forgiveness can be used for out of town travel (job interview, sports participation, health care visit ...) or any emergency. Students will have their lowest test grade automatically dropped.

Final Exam (35%): The final exam will be comprehensive of the course material covered during the semester. The exam will determine 35% of your final average. There will be no makeup of the final exam. Failure to attend the final exam results in the assignment of a zero for the final grade.

General Exam Information:

Tests and Final will be closed book although you may bring the official class cheat sheet. You can find and download it from Blackboard. The instructor will not supply the cheat sheet and you will have to turn it with your exam copy. No information can be added on the cheat sheet.

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Attendance Policy

When you miss class, you miss important information. If you are absent, you are responsible for learning material covered in class. If you have an excused absence, you will be permitted to make up coursework or complete an equivalent assignment agreed upon with me.

To arrange excuses for absences that can be anticipated at the start of the term, you should:

- Submit a request in writing (email is acceptable) stating the dates of the anticipated absence no later than the end of the second week of the course.
- Explain the reason for absence. In some cases, documentation may be required. Please [consult the attendance policy](#) for additional information.
- Include any request for make-up work.

To arrange excuses for absences that cannot be anticipated at the start of the term, (e.g. legal proceedings or illness), you should, at the first opportunity, submit in writing a request stating:

- The date of absence
- The reason for absence. In some cases, documentation may be required. Please [consult the attendance policy](#) for additional information.
- Any request for make-up work as soon as reasonably possible after you become aware of the need to be absent.

Since this course meets three times a week for 50 minutes, you are allowed three unexcused absences. Your grade will be lowered by one letter for each unexcused absence after three unexcused absences.

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Miscellaneous Policies

Academic Integrity

Every student has a role in maintaining the academic reputation of the university. It is imperative that you refrain from violating the Honor Code and the policies included in this syllabus or stated during the delivery of this course. Violations of the University's Honor Code include, but are not limited to, copying the work of others, sharing your work with others, improper citation of sources, using another student's work, access to unauthorized materials, and any other form of academic misrepresentation. For more information, please see the Honor Code at: <http://www.housing.sc.edu/academicintegrity/honorcode.html>

Lectures and course materials (which is inclusive of my presentations, tests, exams, outlines, and lecture notes) maybe protected by copyright. You are encouraged to take notes and utilize course materials for your own educational purpose. However, you are not to reproduce or distribute this content without the instructor's expressed written permission. This includes sharing course materials to online social study sites like Chegg and other services. Students who publicly reproduce, distribute or modify course content may be in violation of the university's Honor Code's Complicity policy, which states: sharing academic work with another student (either in person or electronically) without the permission of the instructor. To best understand the parameters around copyright and intellectual property review ACAF 1.33 "Intellectual Property Policy" at <https://sc.edu/policies/ppm/acaf133.pdf>

Any violation of the University's Honor Code will result in disciplinary measures including referring you to the Office of Academic Integrity. Non-academic penalties are imposed by the

Office of Academic Integrity. Academic penalties imposed by the instructor may range from a zero on the assignment to a failing grade in the course.

Accommodating Disability

Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Student Disability Resource Center: 777-6142, TDD 777-6744, email sadrc@mailbox.sc.edu, or stop by 1705 College Street, Close-Hipp Suite 102. All accommodations must be approved through the Student Disability Resource Center. See <https://www.sa.sc.edu/sds/>.

Diversity Policy

In order to learn, we must be open to the views of people different than ourselves. In this time we share together over the semester, please honor the uniqueness of your fellow classmates and appreciate the opportunity we have to learn from one another. Please respect each other's opinions and refrain from personal attacks or demeaning comments of any kind. Finally, remember to keep confidential all issues of a personal or professional nature that are discussed in class.

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Miscellaneous Information

Quizzes: At the end of every chapter, we will conduct together the online quiz (does not count towards your grade) found on the website.

Videos: Videos shown in class are all available through YouTube.