

Nontraditional Manufacturing

EML 6323 Sections 12928/CAMP, 12927/1FE2, 21843/2FED

Class Period: MWF, 6th period, 12:50 pm-1:40 pm

Location: CSE E118

Academic Term: Spring 2023

Instructor:

Hitomi Greenslet

hitomiy@ufl.edu

352-392-0812

Office Hours: MWF, 2:00 pm-2:45 pm, UF Zoom or 483 Wertheim Lab

Teaching Assistant:

Please contact through the Canvas website

- Julian Long, julian1996@ufl.edu, online, T: 12:30 pm–2:30 pm

Course Description

Focusing on nontraditional additive and subtractive manufacturing processes using electrical, chemical, ultrasonic, magnetic, and photonic energy—including processes and equipment.

Course Pre-Requisites / Co-Requisites

Graduate standing

Course Objectives

Upon completion of this course, students should be able to demonstrate the following:

- A descriptive and qualitative understanding of advanced (nontraditional) manufacturing processes
- The ability to rapidly and accurately perform manufacturing engineering evaluations and analyses
- The ability to survey, understand, and present advanced knowledge and information relevant to the current trends in nontraditional manufacturing

Materials and Supply Fees

Please check One.UF.

Textbooks and Software

- *Advanced Machining Processes–Nontraditional and Hybrid Machining Processes*
Hassan El-Hofy
McGraw-Hill, 2005
ISBN 0-07-145334-2

Recommended Materials

- *Intelligent Energy Field Manufacturing: Interdisciplinary Process Innovations*
Wenwu Zhang
CRC Press, 2010
ISBN 978-1-4200710-1-6
- *Manufacturing Processes for Engineering Materials* (6th Edition)
Serope Kalpakjian and Steven Schmid
Pearson Education, Inc., 2017
ISBN number 978-0-13-429055-3
- *Fundamentals of Modern Manufacturing* (6th Edition)
Mikell P. Groover
John Wiley & Sons, Inc., 2013
ISBN 978-1-119-12879-3

- *Manufacturing Processes and Equipment*
George Tlusty
Prentice-Hall, 2000
ISBN 0-201-49865-0
- Journals including *ASME Journal of Manufacturing Science and Engineering*, *Annals of the CIRP*, *Precision Engineering*, etc.

Course Schedule

- Week 1: Introduction, Metrology, Report preparation 1
- Week 2: Ultrasonic machining
- Week 3: Ultrasonic machining
- Week 4: Water jet machining, Abrasive jet machining
- Week 5: Abrasive jet machining, Abrasive water jet machining, Ice jet machining
- Week 6: Powder deposition technology, Magnetic abrasive finishing
- Week 7: Magnetic abrasive finishing, Magnetorheological fluid finishing, Report preparation 2
- Week 8: Course review for midterm exam, Midterm exam, Electrodischarge machining
- Week 9: Electrodischarge machining
- Week 10: Electrodischarge machining, Laser beam machining
- Week 11: Laser beam machining, Electron beam machining
- Week 12: Plasma beam machining, Ion beam machining, Chemical milling
- Week 13: Photochemical milling, Electropolishing, Presentation
- Week 14: Presentation, Course review for final exam

Note: See the attached course schedule for more detail. (Dates are subject to change—this is to serve as a guideline only.)

Exam schedule

[On-campus students]

Midterm exam: March 1, 2023 (12:50 pm–1:40 pm)

Final exam: May 4, 2023 (7:30 am–9:30 am)

[EDGE students]

Midterm exam: March 1, 2023–March 4, 2023 (11:59 pm)

Final exam: May 4, 2023–May 5, 2023 (11:59 pm)

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance policies

- Attendance is expected and encouraged for all students, but it will not be recorded.
- Excused absences must be consistent with university policies in the Graduate Catalog (<https://catalog.ufl.edu/graduate/regulations>) and require appropriate documentation. Additional information can be found here: <https://gradcatalog.ufl.edu/graduate/regulations/>.

Class policies

- If you need to miss a class, please make appropriate arrangements with a classmate for class notes.
- Cheating or any other form of academic dishonesty will result in failure and prosecution according to University policies.
- Students are expected to conduct themselves in a manner that does not interfere with other students' learning. Disruptive or distracting behavior is prohibited, and Prof. Greenslet reserves the right to temporarily or permanently dismiss distracting students from the classroom.
- Students are responsible for all announcements, assignments, etc., made during lectures, including changes in the scheduling of lecture topics, homework assignments, and exams. Class absence is not a valid excuse for being unprepared.

- Any changes in the schedule or assignments will be communicated to the class via e-mail using your Gatorlink (@ufl.edu) e-mail address and the course website. You are responsible for monitoring your mailbox and the website regularly for any class notices.

Homework policies

- Homework must be turned in through UF e-learning system **by the start** of class on the due date. **In general, late homework will not be accepted.**
- Homework must be neat and legible and show all major steps.
- Homework must be on 8.5" x 11" paper. Homework must have the assignment number, your name, and the date of submission in the upper right-hand corner of the first sheet.
- Homework must have the page number in the bottom right corner of every page.
- Multiple sheets must be placed in the proper order.
- Failure to adhere to the formatting requirements could result in loss of points.
- You may discuss the homework with your classmates; however, all students must provide the solutions themselves. Copying of homework will be treated as academic dishonesty. Use of a solution manual or any online answer source is also considered dishonest.

Exam policies

- It is the students' responsibility to demonstrate their knowledge on exams. In order to be able to grade your work, it must be neat, be legible, and follow logical steps with all work shown. Partial credit may be given for work that can be followed and where the nature and magnitude of the mistake can be identified. No credit will be given for correct answers with insufficient indication of how they were obtained.
- Students should be aware that their work is submitted under the honor code pledge taken by UF students. The pledge is *On my honor, I have neither given nor received unauthorized aid in doing this assignment.* Students can learn more about the UF honor code at the UF Student Government website. (<https://sccr.dso.ufl.edu/>)

[On-campus students]

The first exam will be held in the regular classroom during the regular class period on dates that will be announced later. The final exam will be held at the time assigned by the Registrar.

[Off-campus students]

All exams will be held online. The details will be announced prior to the exam dates.

Project (report and presentation) policies

[On-campus students]

Each team of four students must choose a subject relevant to nontraditional manufacturing processes, survey the relevant literature, and summarize the chosen processes.

[Off-campus students]

Each student must choose a subject relevant to nontraditional manufacturing processes, survey the relevant literature, and summarize the chosen processes.

Written report:

- The report must be on 8.5" x 11" paper.
- Use the provided template. The report must follow the guidelines described in the template. The page number must be in the bottom right corner of each page.
- The report must have the date of submission in the upper-right-hand corner of the first sheet.
- The report must include the title, your name, abstract, introduction, main body of the report, conclusions, and at least ten (10) references.
- The report must be no longer than six (6) pages overall.
- The project progress will be checked step by step: (1) title and abstract, (2) outline, (3) list of references, (4) introduction, and (5) figures and tables. Each document (PDF file) must be submitted **by the group leader** through the UF e-learning system **by the start** of class on the due date. In general, late submissions will not be accepted.

- **Each student** must submit the complete final report with his/her own *Performance Evaluation Form* (PDF file) through the UF e-learning system **by the start** of class on the due date. In general, late submissions will not be accepted.
- **Plagiarism is not acceptable.** To learn how to prevent misconduct related to plagiarism, refer to <http://flexible.dce.ufl.edu/policies/#plagiarism>.

Written presentation [**On-campus students only**]:

- The presentation must be prepared on PowerPoint slides (wide screen 16:9).
- The presentation slides must be numbered and must include the title, your name, main body of the presentation, and date of submission.
- The presentation must indicate sources as needed.
- **Plagiarism is not acceptable.** To learn how to prevent misconduct related to plagiarism, refer to <http://flexible.dce.ufl.edu/policies/#plagiarism>.
- The presentation slides (PowerPoint file) must be submitted by the group leader by e-mail through the UF e-learning system **by the start** of class on the due date. In general, late submissions will not be accepted.

Oral presentation [**On-campus students only**]:

- Use PowerPoint slides (wide screen 16:9).
- Each group must give a presentation in class. The presentation schedule will be determined later.

Feedback (on written report and oral presentation) policies

All students are required to submit feedback.

Written report:

- Each student must choose another students' project report and write comments and suggestions about it.
- Feedback must be on a single 8.5" x 11" page.
- Feedback must have the date of submission in the upper right-hand corner of the sheet.
- Feedback must include your name and the title of the project you chose.
- Use 10 pt. black Arial font.
- Use single spacing between lines.
- Use top, bottom, right, and left margins of 1".
- Feedback (PDF file) must be submitted through the UF e-learning system **by the start** of class on the due date. In general, late submissions will not be accepted.

Oral presentation:

- All students must listen to all on-campus students' presentations, evaluate their presentations, and write comments and suggestions about them.
- Presentation evaluation form (PDF file) must be submitted through the UF e-learning system **by the start** of class on the due date. In general, late submissions will not be accepted.

Evaluation of Grades

[On-campus students]

Assignment	Total Points	Percentage of Final Grade
Homework Sets (3)	10 each	12%
Project (report and presentation)	25	25%
Feedback (report and presentation)	9	9%
Exam 1	25	25%
Final Exam	29	29%
		100%

[Off-campus students]

Assignment	Total Points	Percentage of Final Grade
Homework Sets (3)	10 each	12%
Project (report only)	25	25%
Feedback	8	9%
Exam 1	25	25%
Final Exam	29	29%
		100%

Grading Policy

The following is given as an example only.

Percent	Grade	Grade Points
90.0 - 100.0	A	4.00
87.0 - 89.9	A-	3.67
84.0 - 86.9	B+	3.33
81.0 - 83.9	B	3.00
78.0 - 80.9	B-	2.67
75.0 - 79.9	C+	2.33
72.0 - 74.9	C	2.00
69.0 - 71.9	C-	1.67
66.0 - 68.9	D+	1.33
63.0 - 65.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

[UF Graduate Catalog](#)
[Grades and Grading Policies](#)

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.ua.ufl.edu/public-results/>.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor

hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another

and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; <https://career.ufl.edu>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

On-Line Students Complaints: <https://distance.ufl.edu/state-authorization-status/#student-complaint>.