

Nontraditional Manufacturing

EML 6323 Sections 13706/CAMP, 13705/1FE2, 13704/HYBR, 25868/2FED

Class Period: MWF, 8th period, 3:00 pm-3:50 pm

Location: Online (UF Zoom)

Academic Term: Spring 2021

Instructor:

Hitomi Greenslet

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352-392-0812

Office Hours: MWF, 4:05 pm-4:55 pm, UF Zoom

Teaching Assistant:

Julian Long

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Office Hours: T, 1:00 pm-3:00 pm, UF Zoom

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

Pre-req: Graduate standing

Co-req: N/A

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

N/A

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

- *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, Surface and metrology
Week 2:	Abrasive technologies, Report preparation 1
Week 3:	Ultrasonic machining
Week 4:	Ultrasonic machining, Water jet machining
Week 5:	Abrasive jet machining, Abrasive water jet machining
Week 6:	Ice jet machining, Powder deposition technology
Week 7:	Magnetic abrasive finishing, Magnetorheological fluid finishing, On-campus activity for HYBR
Week 8:	Course review for midterm exam, Midterm exam, Report preparation 2
Week 9:	Electrodischarge machining
Week 10:	Electrodischarge machining
Week 11:	Laser beam machining
Week 12:	Laser beam machining, Electron beam machining
Week 13:	Plasma beam machining, Ion beam machining, Chemical milling
Week 14:	Photochemical milling, Presentation
Week 15:	Presentation, Course review for final exam

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: Sections 13706/CAMP, 13704/HYBR]

Midterm exam: March 3, 2021 (3:00 pm–3:50 pm)

Final exam: April 28, 2021 (3:00 pm–5:00 pm)

[EDGE students: Sections 13705/1FE2, 25868/2FED]

Midterm exam: March 3, 2021–March 8, 2021 (5:00 pm)

Final exam: April 28, 2021–April 30, 2021 (5:00 pm)

Online Course Recording

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

F2F Course Policy in Response to COVID-19

We will have face-to-face instructional sessions to accomplish the student learning objectives of this course. In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.

- You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.

- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms (Click here for guidance from the CDC on symptoms of coronavirus), please use the UF Health screening system and follow the instructions on whether you are able to attend class. Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms.
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. Find more information in the university attendance policies.

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 in compliance with the university policies in the Graduate Catalog (<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance>) and require appropriate documentation.

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. Do NOT slip it under Prof. Greenslet's door. **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: Sections 13706/CAMP, 13704/HYBR]

The first exam will be held 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.

[EDGE students: Sections 13705/1FE2, 25868/2FED]

All exams will follow UF EDGE regulations.

Project (report and presentation) policies

[On-campus students: Sections 13706/CAMP, 13704/HYBR]

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

[EDGE students: Sections 13705/1FE2, 25868/2FED]

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** 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** 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** 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 policies

Feedback is required for all students.

- 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** on the due date. In general, late submissions will not be accepted.

On-campus activity policies [13704/HYBR only]

- An assignment is arranged to be performed on campus in Week 7. The details, including assignment, location, date, and time will be announced later.
- The assignment must be turned in through UF e-learning system **by the start** of class on the due date. Do NOT slip it under Prof. Greenslet's door. **In general, late submission will not be accepted.**

Evaluation of Grades

[On-campus students: Section 13706/CAMP]

Assignment	Total Points	Percentage of Final Grade
Homework	15	15%
Project (report and presentation)	25	25%
Feedback	5	5%
Exam 1	25	25%
Final Exam	30	30%
		100%

[On-campus students: Section 13704/HYBR]

Assignment	Total Points	Percentage of Final Grade
Homework	13	13%
On-campus activity	2	2%
Project (report and presentation)	25	25%
Feedback	5	5%
Exam 1	25	25%
Final Exam	30	30%
		100%

[EDGE students: Sections 13705/1FE2, 25868/2FED]

Assignment	Total Points	Percentage of Final Grade
Homework	15	15%
Project (report only)	25	25%
Feedback	5	5%
Exam 1	25	25%
Final Exam	30	30%
		100%

Grading Policy

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:

<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

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.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and they 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.aa.ufl.edu/public-results/>.

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/policies/student-honor-code-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
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.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: <http://www.counseling.ufl.edu/cwc>, 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 Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.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://care.dso.ufl.edu>.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.