Instructor:
Dr. David Hays
Office location: 1041 Nanoscale Research Facility (building #0070)
Office phone: (352) 273-2286
E-mail: dhays@ufl.edu (preferred contact method)
Office hours: by appointment only. We can meet through Zoom for any questions/concerns that you have.
Class website: run through e-learning in canvas at http://elearning.ufl.edu/

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
N/A

Course Description
This course will provide a foundation in the principles and theories of microscopy with a main emphasis on Scanning Electron Microscopy (SEM). The purpose of the class is to provide the necessary theoretical background to become an effective user of a SEM.

Course Pre-Requisites / Co-Requisites
None

Course Objectives
- Electron microscopy basics
- Vacuum systems and electron sources used in SEM
- Electromagnetic lenses
- Electron-sample interactions
- Backscatter electron yield
- Secondary electron yield
- Electron detectors and operation
- Compositional, topographical, and channeling contrast mechanisms
- The SEM image formation process
- High-resolution SEM imaging
- Sample preparation, contamination and environmental (low-vacuum) SEM
- Electron backscattered diffraction analysis
- Energy dispersive spectroscopy
- Wavelength dispersive spectroscopy
- Auger electron spectroscopy
- Cathodoluminescence
- Transmission electron microscopy

Materials and Supply Fees
None

Recommended Textbooks

Recommended Materials
None
**Course Schedule**

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<th>Week</th>
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**Course Policy in Response to COVID-19**

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.

**Attendance Policy, Class Expectations, and Make-Up Policy**

None

**Evaluation of Grades**

Three (3) mid-term exams administered through Canvas and using Honorlock exam monitoring (1/3 of final score for each mid-term exam)

Each mid-term exam will consist of 25 equally weighted multiple choice questions and will not be explicitly cumulative in nature; the use of a multiple choice format is to remove the ambiguity and fairness issues that tend to accompany the grading of essay/extended answer questions.
There will be an entire lecture dedicated for review before each exam. I will provide summary slides of what will be on the exam, so bring your questions!

You may bring one handwritten 8.5x11 inch sheet of paper to each exam with notes on both sides.

Tentative mid-term exam dates: June 3rd, July 8th, August 5th

**Grading Policy**

- 90% ≤ A
- 90% > A ≥ 87%
- 87% > B+ ≥ 84%
- 84% > B ≥ 80%
- 80% > B- ≥ 77%
- 77% > C+ ≥ 74%
- 74% > C ≥ 70% (lowest possible passing grade)

**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/](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/](https://gatorevals.aa.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/](https://ufl.bluera.com/ufl/). Summaries of course evaluation results are available to students at [https://gatorevals.aa.ufl.edu/public-results/](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/](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
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


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/](https://writing.ufl.edu/writing-studio/).

Student Complaints Campus: [https://care.dso.ufl.edu](https://care.dso.ufl.edu).