

Professional Skills for Research Scientists

BME 6938 Section 3A20

Class Periods: Tues Period 4 (10:40 AM - 11:30 PM) & Thurs Periods 4-5 (10:40 AM - 12:35 PM)

Location: HPNP G-105

Academic Term: Spring 2024

Instructor:

Kevin Otto

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(352) 294-2227

Office Hours: Tuesdays, 3 pm – 4 pm; NEB 333

Course Description

This course covers the professional skills necessary to be successful as a research scientist. Although graduate students usually receive extensive education in the practice of research science, many of the professional skills necessary for a career in research science are learned in an indirect manner from advisement and observation. This course seeks to formalize the training of specific professional skills required by research scientists. Topics covered will include: literature and patent searches, scientific writing, research ethics, job searching and negotiations.

Course Pre-Requisites / Co-Requisites

None

Course Objectives

By the end of this course, students will be able to:

1. Carryout literature searches for journal articles, conference proceedings, patents, and funded grant proposals.
2. Define critical aspects for making a successful research presentation.
3. List characteristics of good scientific writing.
4. Identify critical scientific writing mistakes.
5. Describe the process for reviewing journal manuscripts in detail.
6. Define ethical standards for research including journal authorship, grant writing, collaborative research, protection of human research subjects and animal welfare in research, supervisory and mentoring relationships, and other scientific tasks.
7. Explain the procedures for grant application review at the National Institutes of Health (NIH) and the National Science Foundation (NSF).
8. Prepare an NIH or NSF style grant application.
9. Explain what an SBIR grant application is and identify the parts of one.
10. Prepare job applications for faculty and industry positions.
11. Describe the process of typical interviews for faculty and industry positions.
12. List and describe non-academic careers for individuals with graduate degrees in the sciences and engineering.
13. Compare and contrast the duties of being a faculty member at a small teaching institution, being a faculty member at a large research extensive university, holding a job as a research scientist in industry, and working for a consulting company.
14. Identify the principles and aspects of responsible conduct of research and scholarship.
15. Conduct a patent search and file a patent disclosure.

Materials and Supply Fees

None

Textbooks

- Making the Right Moves: A Practical Guide to Scientific Management for Postdocs and New Faculty, Second Edition. (FREE at: <https://www.hhmi.org/science-education/programs/resources/making-right-moves>)

Recommended Materials

- How to Write and Publish a Scientific Paper, 8th Edition, by Barbara Gastel, Robert A. Day. Greenwood. 2016. ISBN: 9781440842627 (<https://www.amazon.com/How-Write-Publish-Scientific-Paper-dp-1440842809/dp/1440842809/>)
- The Grant Application Writer's Workbook. National Institutes of Health 12.21 (or National Science Foundation 10.21) Version, by Stephen W. Russell, David C. Morrison. Grant Writers' Seminars and Workshops. (<https://www.grantcentral.com/workbooks/>)

Course Schedule

Week 1	Introduction to course, literature and patent searches
Week 2	Scientific ideation, journal publication process, how to write well
Week 3	Scientific ethics and misconduct, authorship, peer review, collaborations
Week 4	Postdoc'ing, ethical decision making, The Lab role playing, entrepreneurship
Week 5	Data management, human subjects training, animal research training
Week 6	Seeking research funds, mentoring
Week 7	Writing grant proposals, NIH & NSF formats, giving presentations
Week 8	Duties of a faculty member, getting a faculty position
Week 9	Tenure process and beyond, getting an industry or government position
Week 10	Teaching, research administration, interdisciplinary research
Week 11	Lab management, manager vs. leader, time management
Week 12	Practice scientific writing editing, work on hypotheses/goals
Week 13	Team success, leadership training, self-assessment
Week 14	Mock study section

FINAL EXAM: 5/1/2024 @ 7:30 AM - 9:30 AM

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is mandatory. Any student missing a class without prior approval from the instructor will have 5 points taken off their final average for each class missed. University related athletic, artistic, and academic participation, religious holidays, and medical appointments are valid reasons to miss class but approval needs to be obtained prior to the missed class. 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://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Evaluation of Grades:

1. Students will be required to complete homework assignments. Examples include preparation of a research presentation, review of a journal manuscript, writing sections of a grant proposal, and constructing a job application for a faculty position. Late assignments will not be accepted.
2. Students will have a quiz every Thursday that will cover reading assignments.
3. Students will complete an NIH or NSF style grant proposal for a project of their own choosing. Turning in the proposal late will lead to a zero grade.
4. There will be a final exam.

Student Evaluation:

Homework Assignments	25%
Quizzes	25%
Final Grant Proposal	25%
Final Exam	25%

Grading Procedures:

The grading scale for the course will be as follows:

Grade	Percentage
A	92.50-100%
A-	90.00-92.49%
B+	87.50-89.99%
B	82.50-87.49%
B-	80.00-82.49%
C+	77.50-79.99%
C	72.50-77.49%
C-	70.00-72.49%
D+	67.50-69.99%
D	62.50-67.49%
D-	60.00-62.49%
F	below 60.00%

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 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/>.

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 varied perspectives and lived experiences within our community and is committed to supporting the University’s core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

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:

- Francis Lai, Undergraduate Academic Advisor, 352-273-8096, undergrad@bme.ufl.edu
- HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Pamela Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@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/getting-help/>; <https://distance.ufl.edu/state-authorization-status/#student-complaint>.