

## ***BME 6938 – Professional Skills for the Research Scientists - Spring 2025***

### **Instructor:**

Wesley Bolch, PhD, (352) 273-0303, [wbolch@ufl.edu](mailto:wbolch@ufl.edu)

Office Hours: By appointment

*Email Correspondence: If emailing about class issues, please use the email facility within Canvas.*

### **Course Description (3 Credits)**

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 Prerequisites:** 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.

**Meeting Times:** Tuesdays, Periods 5-6, 11:45 to 1:40 pm / Thursdays, Period 6, 12:50 to 1:40 pm

**Meeting Location:** Keene-Flint Hall Room 121

### ***Textbooks***

- Making the Right Moves (**MRM**): A Practical Guide to Scientific Management for Postdocs and New Faculty, Second Edition. (<https://www.hhmi.org/science-education/programs/resources/making-right-moves>)
- How to Write and Publish a Scientific Paper (**HWPS**), 9th Edition, by Barbara Gastel, Robert A. Day. Greenwood. 2022. ISBN: 978-1-4408-7883-1 (e-book) (<https://www.amazon.com>)
- The Grant Application Writer's Workbook (**GAWW**). National Institutes of Health 12.21 (or National Science Foundation 10.21) by Stephen W. Russell, David C. Morrison. Grant Writers' Seminars and Workshops, LLC. (<https://www.grantcentral.com/workbooks/>)

**Attendance and Expectations:**

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/>.

Grading Policy	Total Points	Percentage of Final Grade	Exam / Due Dates
Homework Assignments	100 points each	25%	
Quizzes on Reading Assignments	30 points each	25%	
Final Grant Proposal	100 points	25%	
Final Exam	100 points	25%	May 1, 2025 / 10 am - Noon

**Grading Policy**

Percent	Grade	Grade Points
92.50 - 100.0	A	4.00
90.00 - 92.49	A-	3.67
87.50 - 89.99	B+	3.33
82.50 - 87.49	B	3.00
80.00 - 82.49	B-	2.67
77.50 - 79.99	C+	2.33
72.50 - 77.49	C	2.00
70.00 - 72.49	C-	1.67
67.50 - 69.99	D+	1.33
62.50 - 67.49	D	1.00
60.00 - 62.49	D-	0.67
Below 60.00	E	0.00

More information on UF grading policy may be found at:  
<https://gradcatalog.ufl.edu/graduate/>

## Lecture Schedule

<i>Week</i>	<i>Date</i>	<i>Lecture # and Topic</i>	<i>Reading</i>	<i>Guest Lectures / Class Activity</i>
<b>1</b>	<b>Jan</b>	14	Course Introduction	Course Syllabus
		14	Obtaining and Negotiating a Faculty Position	Chap 1 – MRM
		16	Scientific Writing – Some Preliminaries	Part 1 - HWPSP
<b>2</b>		21	Understanding the University Structure / Tenure	Chap 2 – MRM
		21	Understanding the University Structure / Tenure	Chap 2 – MRM
		23	Scientific Writing – Preparing the Text	Part 2 - HWPSP
<b>3</b>		28	Laboratory Leadership in Science	Chap 3 – MRM
		28	Laboratory Leadership in Science	Chap 3 – MRM
		30		Guest Lecturer #1
<b>4</b>	<b>Feb</b>	4	Staffing Your Laboratory	Chap 4 - MRM
		4	Staffing Your Laboratory	Chap 4 - MRM
		6	Scientific Writing – Preparing the Text	Part 2 - HWPSP
<b>5</b>		11	Mentoring and Being Mentored	Chap 5 – MRM
		11	Mentoring and Being Mentored	Chap 5 – MRM
		13		Guest Lecturer #2
<b>6</b>		18	Time and Project Management	Chap 6/7–MRM
		18	Data Management / Laboratory Notebooks	Chap 8 - MRM
		20	Scientific Writing – Tables and Figures	Part 3 - HWPSP
<b>7</b>		25	NIH Grants – Before You Begin Writing	Part 1 - GAWW
		25	NIH Grants – Specific Aims and Research Strategy	Part 2 - GAWW
		27		Guest Lecturer #3
<b>8</b>	<b>Mar</b>	4	NIH Grants – Rest of your Application	Part 3 - GAWW
		4	NIH Grants – Maximizing Competitiveness	Part 4 – GAWW
		6	Scientific Writing – Publishing Your Paper	Part 4 - HWPSP
<b>9</b>		11	NSF Grants – General Research Grants	
		11	NSF Grants – CAREER Awards	
		13		Guest Lecturer #4
<b>10</b>		18	<i>No Class – Spring Break</i>	
		18	<i>No Class – Spring Break</i>	
		20	<i>No Class – Spring Break</i>	
<b>11</b>		25	<i>No Class - NCRP Annual Meeting</i>	
		25	<i>No Class - NCRP Annual Meeting</i>	
		27		Guest Lecturer #5
<b>12</b>	<b>Apr</b>	1	Understanding Technology Transfer	Chap 11 - MRM
		1	Understanding Technology Transfer	Chap 11 - MRM
		3	Scientific Writing – Other Writing for Publication	Part 5 - HWPSP
<b>13</b>		8	Setting Up Collaborations	Chap 12 - MRM
		8	Setting Up Collaborations	Chap 12 - MRM
		10		Guest Lecturer #6
<b>14</b>		15	Teaching and Course Design	Chap 13 - MRM
		15	Teaching and Course Design	Chap 13 - MRM
		17	Scientific Writing – Conference Communications	Part 6 - HWPSP
<b>15</b>		22	Mock Study Section	Class Participation
		22	Mock Study Section	Class Participation

### ***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.a.a.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.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.a.a.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 Conduct 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. 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
- HWCOE Human Resources, 352-392-0904, [student-support-hr@eng.ufl.edu](mailto:student-support-hr@eng.ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto: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](mailto: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](mailto: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/>.

## Campus Resources - Academic Resources

**E-learning technical support**, 352-392-4357 (select option 2) or e-mail to [Learning-support@ufl.edu](mailto: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>.