

**RI - MULTIDISCIPLINARY RESEARCH METHODS 2 - FALL 2016, 1-3 CREDIT
COURSE SYLLABUS**

EDF 3912 xxx (CRN)	Class time:	Classroom:
Instructor:	Email: Phone:	Office: Office hours:

Course Description:

This course supports students that already have a faculty research mentor as they navigate the undergraduate research process. This course is *inclusive* of multiple disciplines and methodologies, as opposed to a comprehensive survey, and will cover material that is both common to research in all disciplines and specific to the students' research interests. As a part of this course, students will have the opportunity to apply for research grants to fund their own research study.

Research Intensive Course:

This course contains assignments designed to help students conduct research and inquiry at an intensive level. If this class is selected to participate in the university-wide assessment program, students will be asked to complete a consent form and submit electronically some of their research assignments for review. Visit the Office of Undergraduate Research and Inquiry (OURI) for additional opportunities and information at <http://www.fau.edu/ouri>.

Learning Goals:

- Evaluate aspects of professional conduct in academic research and apply it to your research experience
- Learn the basic components of research ethics in order to relate research ethics to your own research and infer ethical decisions in case studies
- Practice/improve skills in efficiently reading, comprehending, and critiquing the primary literature
- Synthesize research literature so that you may construct a conceptual framework of the current state of research for your chosen topic/discipline
- Formulate a written abstract of your current research project
- Develop a professional curriculum vita (CV)
- Design a research proposal by incorporate the information and skills you've learned in this class
- Learn the steps involved in finding and applying for research funding, apply them to create and submit a research grant application
- Integrate effective oral presentation skills when developing/preparing for a talk

Required Course Materials:

- A research notebook
- Required readings: will be distributed in class and on Canvas and include the sources listed in the "Selected Readings and Resources" section below

Course Prerequisites and Co-requisite:

1. Research Methods I

* The prerequisite (Research Methods I) may be waived given demonstrated skill in peer-reviewed literature search, comprehension, and analysis as well as research ethics.

2. Students must have a faculty research mentor, be working on a project, and have collected some preliminary data

Course Policies and Procedures:

A. Course Evaluation: The course grade will be determined from student participation during class and on-time completion of assignments. Assignment due dates will be announced in class and on Canvas and submitted through Canvas. No late work will be accepted. To receive credit for an assignment, you must complete it to the best of your ability and submit it on time. All grades will be posted to Canvas.

Graded assignments and associated points:

Short writing assignments	(4*10pts) 40 pts
Bibliography and research paper pdfs	(2*20pts) 40 pts
2 Research workshop reflections	(2*10pts) 20 pts
Abstract	30 pts
Curriculum Vita	10 pts
Grant proposal	70 pts
Proposal presentation	40 pts
Total	250 pts

Assignment descriptions:

Short writing assignments: Summarize, reflect on, and critique aspects of topics discussed in class by providing well-thought-out, revised, logical paragraphs. Length and specific writing prompt will be provided for each particular assignment.

Bibliography and research paper pdfs: Find, read, understand, and critically analyze peer reviewed research publications using the skills gained in this course. Provide an annotated bibliography matching the template provided to you and submit pdfs of the papers you chose.

2 Research workshop reflections: Attend a minimum of two research related workshops or seminars before the last day of the class. Submit a 1 paragraph summary of each workshop along with comments on what new things you learned and how the workshop/seminar has bettered you as a researcher.

Abstract: Write a logical, descriptive, concise, 1-paragraph summary of your project.

Curriculum Vita (CV): Construct a comprehensive, professionally formatted CV that describes your academic, research, and other qualifications/experience. The audience for this document is a research mentor.

Grant proposal AND proposal presentation: You will learn to write a basic research grant proposal and submit it to FAU's Undergraduate Research Grant (or similar appropriate) competition. During this intensive process, you will improve your research and communication skills while pursuing funding for your project. Specifically, we will address the following:

1. Knowledge:
 - a. Find and use scholarly resources, such as peer reviewed journal articles (incorporate those from your annotated bibliography).
 - b. Understand, analyze, evaluate, and build on the background scholarly literature

- pertaining to your project and discipline.
 - c. Appropriately incorporate the proper vocabulary of your field.
 - d. Describe, compare, contrast, and critique key theoretical frameworks applicable to your project.
2. Formulate Question/Problem:
 - a. Generate a feasible and novel research question that addresses an identified gap in the current research.
 - b. Justify your rationale for why it is *important* to address this question/problem.
 3. Plan of Action:
 - a. Design and describe your plan for answering your research question with the techniques and tools available to you in your lab. The design should be logical and based on relevant and current methodologies within your discipline.
 - b. Clearly explain the detailed procedures you use to collect and analyze your data.
 - c. Identify and discuss any potential pitfalls of your plan and how you intend to mitigate/control for them.
 - d. Implement that plan (enough to have generated data that you can discuss) and refine it, ensuring that you are gathering data that directly answer your original question.
 4. Critical Thinking:
 - a. Assess previous literature critically to determine its strengths and pitfalls and how that relates to your proposed project.
 - b. Evaluate and justify the feasibility of your project design.
 - c. Anticipate potential future outcomes from your project.
 - d. Interpret your preliminary data, making sure to address any unexpected findings
 - e. Anticipate and recognize potential sources of error in your interpretation of the data.
 5. Ethics:
 - a. Learn the key concepts pertaining to research integrity and become familiar with the related groups and resources available at FAU.
 - b. Identify research ethics considerations/concerns in your own project. With the help of your mentor, formulate your plan to preemptively address them.
 - c. Become certified as necessary based on what your project requires (IRB, IACUC, EH&S, CITI [strongly recommended for all], etc...).
 - d. Integrate what you have learned into the plan and execution of your project and convey that clearly in your proposal.
 6. Communication:
 - a. Effectively and persuasively convey your research project idea and preliminary results in your grant proposal.
 - b. Construct and deliver an oral presentation, with slides, that targets your educated, non-expert audience.
 - c. Incorporate all presentation guidelines provided by the instructor on content and formatting while also constructing a well-organized, logical, informative, and engaging talk.
 - d. Properly reference previous studies/works pertaining to your project.

B. Grading Scale: The following scale will be used for computing the final grade.

A	90 -100%
B	80 - 89%
C	70 - 79%
D	60 - 69%
F	less than 60%

C. Attendance Policy:

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance.

Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

If a student must miss a class, documentation must be provided to the instructor by the next class period, or the student's participation grade will be impacted. Only 1 excused absence is permitted; more than one absence will result the loss of 1 letter grade per absence.

D. Classroom Etiquette Policy: University policy on the use of electronic devices states: "In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions." You may be asked to leave the class session for noncompliance.

E. Code of Academic Integrity Policy: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001. http://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf

F. Disabilities Statement: In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

G. Counseling and Psychological Services (CAPS) Center: Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their

ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>.

H. SPOT Evaluation:

At the end of the semester, SPOTs (Student Perception of Teaching forms) are to be completed online. Faculty no longer provide paper SPOTs in class at the end of the semester. Please remember to complete the SPOTs for the classes in which you are enrolled. In order to complete the SPOT, please go to <https://spot.fau.edu>. The instructor will provide in-class time at the end of the semester for you to complete the SPOT in class using your smartphone, tablet, or laptop.

I. Important Dates:

The instructor reserves the right to make changes to this schedule at any time. Changes may be announced via Canvas and/or verbally in class. This schedule also includes dates based upon the current university academic calendar. You are responsible for checking the academic calendar on the university website for any changes during the academic term.

University-set dates:

First day of classes: 8/22

Last day to drop/add: 8/26

Veteran's Day, no class: 11/11

Last day to withdraw from course: 11/18

Last day of class: 12/6

Schedule of course topics:

Week	Dates	Topic	Homework (due following Friday)
1	Aug 26	Course introduction, discuss class expectations Discuss your previous research experience	<ul style="list-style-type: none"> Describe your previous research experience and your goals for our class
2	Sept 2	Review on literature search and analysis techniques	<ul style="list-style-type: none"> Find and read 2 articles related to your topic Create an annotated bibliography of these 2 articles based on the provided template & submit the pdfs of the 2 articles
3	Sept 9	Personal conduct in research settings Imposter syndrome	<ul style="list-style-type: none"> Reflect on an instance where you could have done things differently to create a better outcome during your research Find 2 more articles, read them, and add them to your annotated bibliography
4	Sept 16	Research ethics and Responsible Conduct in Research discussion	<ul style="list-style-type: none"> Complete CITI RCR training (recommended) to obtain certification Alternative assignment: complete one of the research ethics interactive training modules “The Lab” or “The Clinic” at https://ori.hhs.gov/
5	Sept 23	Writing a grant proposal: introduction and methods	Submit your proposal introduction & methods sections
6	Sept 30	Writing a grant proposal: preliminary/anticipated results, budget Following RFP guidelines	<ul style="list-style-type: none"> Submit the remainder of your proposal Revise your intro & methods sections Combine all sections into full grant application
7	Oct 7	Peer review of grant applications	<ul style="list-style-type: none"> Revise your grant application based on peer and professor feedback Submit draft to your mentor for review Submit your finalized application to the FAU Undergraduate Research Grant Pgm with permission from The instructor and your research mentor
8	Oct 14	Resume/CV writing Asking for LORs	Submit your CV
9	Oct 21	Finding funding & presentation opportunities outside of FAU	<ul style="list-style-type: none"> Find and list 3 other funding opportunities or conferences that apply to you Find 2 more articles, read them, and add them to your annotated bibliography
10	Oct 28	Writing abstracts	Write an abstract of your current research project
11	Nov 4	Guest research talk: Panel discussion	<ul style="list-style-type: none"> Revise your abstract and resubmit it

		on the variety of careers that utilize a background in research OR data recording, working in Excel, creating graphs, basic states analysis	<ul style="list-style-type: none"> • Work on proposal presentation
12	Nov 11	No class - holiday	Work on proposal presentation
13	Nov 18	Creating and delivering effective oral presentations The art of the “elevator pitch”	Work on proposal presentation
14	Nov 25	No class – Thanksgiving break	Work on proposal presentation
15	Dec 2	Proposal presentations	<ul style="list-style-type: none"> • Write a summary and critique of 2 presentations you saw • Notify the instructor of your of research plans

Selected Readings and Resources List:

- Andrade, C. 2011. How to write a good abstract for a scientific paper or conference presentation. *Indian J Psychiatry*. 53(2): 172-175.
- How to construct a *Nature* summary paragraph. *Nature* guide to authors: First paragraphs for Letters. Information sheets 3d. www.nature.com/nature/authors/gta
- Raff, J. 2013. How to read and understand a scientific paper: a guide for non-scientists. Published on <https://violentmetaphors.com>.
- A rough guide to spotting bad science. 2014 Compound Interest. www.compoundchem.com.
- Shiffman, D. 10 Tips for grad students to make the most of a scientific conference. www.southernfiredscience.com.
- Professionalism. WebGURU: Guide for Undergraduate Researchers. <http://www.webguru.neu.edu/professionalism>. Accessed 9/8/16.
- The Impostor Syndrome. Caltech Counseling Center. <https://counseling.caltech.edu/general/InfoandResources/Impostor>. Accessed on 9/9/16.
- Schwartz, M. 2008. The importance of stupidity in scientific research. *Journal of Cell Science*. 121(11): 1771.
- The Laboratory Notebook. WebGURU: Guide for Undergraduate Researchers. <http://www.webguru.neu.edu/professionalism>. Accessed 9/8/16.
- Zielinska, E. 2011. Poster Perfect: How to drive home your science with a visually pleasing poster. *The-scientist.com*. <http://www.the-scientist.com/?articles.view/articleNo/31071/title/Poster-Perfect/>. Accessed 3/2/17.
- CITI Program. Responsible conduct in research course. <https://about.citiprogram.org/en/homepage/>.
- The Office of Research Integrity. <https://ori.hhs.gov/>
- Resnick, D. 2015. What is Ethics in Research & Why is it Important? National Institute of Environmental Health Sciences. <https://www.niehs.nih.gov/research/resources/bioethics/whatis/>. Accessed 4/12/17.
- Koyama, D. and Nal, S. 2013. Introduction to grant writing. Purdue Online Writing Lab. <https://owl.english.purdue.edu/owl/resource/981/1/>. Accessed 3/10/17.