Spring 2019

STS 205-H02: Introduction to Research Methods

Elizabeth Petrick

STS 205: Intro to Research Methods - Honors

Wednesday/Friday 1-2:20pm
Honors College 210

Professor Elizabeth Petrick
Email: elizabeth.r.petrick@njit.edu
Office: 324 Cullimore Hall
Office Hours: Tues/Thurs 11:30-12:30 or by appointment.
Prerequisites: HUM 101 and 102 or equivalent.

Faculty Mentors:

Professor Matthew Adams [Civil and Environmental Engineering]
Professor Sagnik Basuray [Chemical Engineering]
Professor Dibakar Datta [Mechanical Engineering]
Dean Louis Hamilton [History]
Professor Mathew L. Schwartz [College of Architecture and Design]
Professor Xinyue Ye [Informatics]

Course Description:

This course is intended to give first and second year undergraduate honors students an understanding of what research is, what it is used for, how it is conducted, and how it is reported. It provides an overview of applying the scientific method to real-life research, including ethical concerns, qualitative and quantitative methods (and how and when they should be used), and how to critically evaluate published research findings. Students work with faculty mentors on research projects, while writing proposals for the funding of future research.

Objectives:

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

- Define science
- Identify a research problem
- Identify and mitigate ethical issues associated with a research project
- Conduct a thorough literature review and critique published research
- Develop research questions and hypotheses
- Determine which type of data (qualitative or quantitative) is most appropriate to answer the research questions
- Assess multiple formats for organizing, developing, and presenting research
- Develop a research network and understand how to communicate with faculty, graduate students, peers, etc. about research

Required Readings:

All readings will be available on Moodle.

Course Requirements:

Research Proposal: 35%
    Draft: 5%
    Final: 30%
Course Participation / Lab Practicum Faculty Mentor Evaluation: 15%
Student Presentation: 25%
Literature Review: 15%
CITI Responsible Conduct of Research course: 10%

Late Paper Submissions: Papers will lose one grade for every day late (A to A-, A- to B+). Papers will not be accepted more than 1 week late.

Paper Formatting: All papers should be typed, double-spaced, 12 pt standard font (Times, Helvetica, Arial, etc), 1" margins. For digital submission, only the following file types are accepted: pdf, doc, docx.

Grading Scale (for assignments only, course grades will not include: A+, A-, B-, C-, D+):

96-100	***A+***
93-95	***A***
89-92	***A-***
86-88	***B+***
83-85	***B***
79-82	***B-***
76-78	***C+***
73-75	***C***
69-72	***C-***
66-68	***D+***
60-65	***D***
0-60	***F***

Academic Integrity:
Students are expected to follow the University Code on Academic Integrity. Plagiarism will not be tolerated. All cases of suspected plagiarism/cheating will be reported for investigation. For details, see: http://www.njit.edu/academics/integrity.php

Laptops and other technology rules:
Students may use laptops, tablets, cell phones, or other technology in this course for class-related activities only. Texting, using Twitter, playing games, etc. interrupts the flow of discussion, distracts other students, and will inevitably embarrass you when I have to call you out. Students are prohibited from using headphones. You are in this class approximately 3 hours a week. Please be present and prepared when you are here. If you would rather text or surf the internet, please do not come to class.

Students with Disabilities or Special Needs:
Students who have disabilities or special needs should contact NJIT's Student Disability Services to help procure accommodations in completing coursework. The center can be found at http://www.njit.edu/counseling/services/disabilities.php.

Class Schedule:

Note1: Underlined days are normal class; Lab Practicum days are spent conducting research with your mentor.
Note2: Dates subject to change as NJIT schedules relevant events.

Week 1: Introduction

1/23 – What Is Science?

1/24 – Research Questions and Qualitative Research

- Lisa C. Kaczmarczyk, Elizabeth R. Petrick, J. Philip East, and Geoffrey L. Herman. 2010. "Identifying student misconceptions of programming." In *Proceedings of the 41st ACM technical symposium on Computer science education* (SIGCSE '10). ACM, New York, NY, USA, 107-111.
- Bring any scientific article of your choice to class (paper or electronic copy)

Week 2: Choosing a Research Project

1/30 – Quantitative Research and Lit reviews (Guest lecture by Dr. Kyle Dobiszewski and Dr. Davida Scharf)

2/1 – Faculty Mentor Guest Lectures

- Professor Dibakar Datta [Mechanical Engineering]
- Dean Louis Hamilton [History]

Week 3: Choosing a Research Project Cont.

2/6 – Faculty Mentor Guest Lectures

- Professor Sagnik Basuray [Chemical Engineering]
- Professor Matthew Adams [Civil and Environmental Engineering]

2/8 – Faculty Mentor Guest Lectures

- Professor Xinyue Ye [Informatics]
- Professor Mathew L. Schwartz [College of Architecture and Design]

Week 4: Lab Work

- Nicholas Walliman. *Research Methods: The Basics*. (New York: Routledge, 2011), pgs 65-77.

2/13 – Lab Practicum
Literature Review Due

2/15 – Lab Practicum

Week 5: Lab Work and Literature Review

2/20 – Lab Practicum

2/22 – Literature Review Workshop

Week 6: Lab Work

- Darrell Huff. *How to Lie with Statistics*. (New York: W.W. Norton & Co., 1954).

2/27 – Lab Practicum

2/29 – Lab Practicum

Week 7: Research Proposal Workshop

3/6 – Writing a Research Proposal Part 1

- Nicholas Walliman. *Research Methods: The Basics*. (New York: Routledge, 2011), pgs 146-166.
- Michael Tadros. "Investigating the lack of voter participation among the demographic of 18-24 year olds." NJIT Provost's Summer Research Fellowship, 2016.

3/8 – Writing a Research Proposal Part 2

Revised Literature Review Due

Week 8: Peer Review

3/13 – Lab Practicum

3/15 – Peer Review

Proposal Rough Draft Due

****SPRING BREAK, 3/17-3/24****

Week 9: Rough Draft Workshop

- "Organizing Your Social Sciences Research Paper: Writing a Research Proposal." University of Southern California Libraries, Jan. 15, 2019. http://libguides.usc.edu/writingguide/researchproposal [read while revising your proposal]

3/27 – Proposal Revision Workshop

3/29 – Lab Practicum

****Apply for Provost's Undergraduate Summer Research Award****

Week 10: Lab Work

4/3 – Lab Practicum

4/5 – Lab Practicum

Week 11: Lab Work

4/10 – Lab Practicum

4/12 – Lab Practicum

Week 12: Lab Work

4/17 – Lab Practicum

Dana Knox Student Research Showcase

4/19 - ****NO CLASS****

Week 13: Ethics and Presentations

4/24 – Responsible Research Discussion

- Paul Oliver. *The Student's Guide to Research Ethics*. (Maidenhead: Open University Press, 2003), pgs 1-74.
- "Avoiding Plagiarism." Purdue Online Writing Lab, https://owl.purdue.edu/owl/research_and_citation/using_research/avoiding_plagiarism/is_it_plagiarism.html

  CITI RCR Certification Due

4/26 – Presentations

Week 14: Student Presentations

5/1 – Presentations

5/3 – Presentations

Week 15: Wrap-up

5/7 – Future Plans

Final Proposal Due

Helpful Links

• The NJIT Undergraduate Research and Innovation Program's website has information aimed at the undergraduate researcher. The research proposal assignment for this course will follow the formatting and content instructions for the NJIT Provost Summer Undergraduate Research and Innovation Program. Alternatively, with permission of the instructor, the proposal can follow the guidelines for the Undergraduate Research and Innovation Student Grant. http://centers.njit.edu/uri/programs/index.php

• To participate in research at NJIT, certain safety-related training courses offered by Environmental Health and Safety may be required. Students are encouraged to attend both the "Lab Safety Training" AND the "Biological Safety and BBP Training" at the beginning of the Spring 2019 semester. The course schedule can be found at the following link: http://www.njit.edu/environmentalsafety/training-0/

• NJIT offers the Collaborative Institutional Training Initiative (CITI) Program to provide online, interactive courses on topics related to research (administration, ethics, safety). The CITI course on the "Responsible Conduct of Research" (https://about.citiprogram.org/en/series/responsible-conduct-of-research-rcr/) is required as a way of providing thorough training on research ethics.