ISC 3523C, Section 1B81, RESEARCH METHODS
Spring, 2016, T,Th Periods 2-3, Flint 117

Instructor: Dr. Kathryn R. Williams; krw@chem.ufl.edu; 392-7369
Office Hours: W, 8th; Thurs, 9th; CLB 220

Course Description: Research Methods is a required one-semester, three-hour course in the UFTeach sequence. Students must be pursuing the UFTeach minor in science or mathematics education. Research Methods introduces students to scientific research in a broad sense, including experimental design and data analysis, as well as written and oral presentation.

Student Learning Outcomes: Research Methods is designed to accomplish the following educational goals:

- Provide students with the tools that scientists use to solve scientific problems;
- Give students the opportunity to use these tools in a laboratory and/or field setting;
- Introduce students to scientific communication via peer-reviewed scientific literature, as well as formal written and oral reports;
- Increase student understanding of how scientists develop new knowledge and insights.

Required Activities:
Three investigations:

1. Student-designed inquiry involving simple apparatus or non-intrusive observations. Data analysis using appropriate statistical methods and/or graphing techniques. Written report.
2. Student-designed survey (Institutional Review Board approval required). Data analysis using appropriate statistical methods and/or graphing techniques. Oral class presentation.
3. Research project under the direction of a UF faculty member. Students need to find a project director by the end of January. At least six hours of lab/field work per week. Data analysis in consultation with the project director and Dr. Williams. Written report and oral presentation.

Written commentaries on faculty presentations:
Throughout the semester, research faculty from various UF departments will give presentations on how research is performed in their disciplines. Students must attend all presentations and write summaries with personal reflections (one double-spaced page) for 10 of them. Commentaries must be submitted by the Tuesday following the faculty visit. Late commentaries will not be accepted.

The commentaries will contain two paragraphs: summary and personal reflection. The summary paragraph must be written in formal scientific English (proper grammar, no slang or street talk, no "I" or other personal references). In the second paragraph, you may use a freer writing style (but no "text-ese") to express your personal opinions of the presentation, research methodology, and/or scientific findings.

Classroom activities:
Students will be designated to introduce/thank speakers, lead class discussions, provide progress reports, etc. Students are expected to attend class and participate in discussions.

Assignments:
Written homework will be assigned throughout the semester.

Grading:
Grades will be distributed as follows:

Assignments:	14%	(Problem Sets, 10%; Library, 2%; NIH Certification, 2%)
Classroom activities:	15%	(-1% for each unexcused absence; one absence free)
Commentaries:	10%	
Project 1:	15%	(Proposal, 3%; Quality, 3%; Written Report, 9%)
Project 2:	12%	(Proposal, 3%; Quality, 3%; Oral Report, 6%)
Project 3:	34%	(Proposal, 3%; Quality, 3%; Progress Report 1, 5%; Progress Report 2, 5%; Final Written Report, 10%; Oral Report, 8%)

Grading Scale: Grades will be assigned according to the following percentage totals using standard rounding conventions:

90-100, A 85-89, A- 80-84, B+ 75-79, B 70-74, B- 65-69, C+
60-64, C 55-59, C- 50-54, D <50, E

Date	Speaker; Activity	Special
Tu, 1/5	Introduction; Lab Safety; Data analysis fundamentals	
Th, 1/7	Ms. Melody Royster	Meet in Marston 308; Bring laptops
Tu, 1/12	Discussion of Marder, Chap 1 Excel Practice;	Library assignment due
Th, 1/14	Prof. Sixue Chen Excel Practice;	Ideas for Project 1
Tu, 1/19	Excel Competency;	Project 1 proposal due Commentary, Chen
Th, 1/21	Report writing Professor Kevin Knudsen	Topics for Project 3
Tu, 1/26	Prof. Eric Deumens;	Commentary, Knudsen
Th, 1/28	Data analysis fundamentals Prof. Amlan Biswas	Project 3 proposal due
Tu, 2/2	Prof. Hans Van Oostrum Data analysis fundamentals	Commentaries, Deumens & Biswas
Th, 2/4	Prof. Tim Garrett	Project 1 draft report due
Tu, 2/9	Prof. Bruce Goldberger	Project 2 ideas Commentaries, Van Oostrum & Garrett
Th, 2/11	Peer review process; Prof. Ata Sarajedini	Project 1 final report due
Tu, 2/16	Prof. Catherine Price	Project 2 proposal Commentaries, Goldberger & Sarajedini
Th, 2/18	Ms. Michelle Leonard	NIH certificate due

Tu, 2/23	Prof. Samuel Wong	Project 2 draft PowerPoint Commentary, Price
Th, 2/25	Project 2 corrections	Data analysis assignment due
Tu & Th, 3/1 & 3/3	Break Week	
Tu, 3/8	Project 2	Project 2 presentations Commentary, Wong
Th, 3/10	Project 2	Project 2 presentations
Tu, 3/15	Project 2	Project 2 presentations
Th, 3/17	Project 3	Project 3 progress reports (Group 1)
Tu, 3/22	Project 3	Project 3 progress reports (Group 2)
Th, 3/24	Project 3	Project 3 progress reports (Group 3
Tu, 3/29	Project 3	Project 3 progress reports (Group 1)
Th, 3/31	Project 3	Project 3 progress reports (Group 2)
Tu, 4/5	Project 3	Project 3 progress reports (Group 3)
Th, 4/7	Project 3	Project 3 presentations
Tu, 4/12	Project 3	Project 3 presentations
Th, 4/14	Project 3	Project 3 presentations
Tu, 4/19		Project 3 written reports due

Note: Class time 3/17-4/5 will be devoted to progress reports. The class will be divided into 3 groups. Only the designated students need to attend and present reports.