Course Syllabus

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CSCI 514 - Research Methodology in Computer Science

Term

Spring 2025

Instructor Information

Yasmine Elglaly

email: elglaly@wwu.edu

Office hours: Thursday 12:00 to 1:00 PM, any by appointment.

Office: KB-403 C

Students are welcome to make an appointment to meet or to visit during office hours to ask questions. If you are planning on visiting during office hours, it is helpful (but not required) to inform the professor in advance so that if several students want to meet, then different appointment times can be established.

TAs

Daniel Koronthaly *(He, him, his)*

email: **korontd@wwu.edu (mailto:korontd@wwu.edu)**

Office hours and location: CF405 Wednesday 3-4pm

Siddhu Bhimireddy

email: **bhimirs@wwu.edu (mailto:bhimirs@wwu.edu)**

Office hours and location: CF 163, Thursday, 12:30-1:30pm

Section

Tuesday and Thursday: 10:00 to 11:40 AM, Location: AW-306

Prerequisites & Notes

Graduate Status, pre-master and senior students with GPA 3.0+.

Credit hours: 4

Course Description

Research methodology topics identified as appropriate, emphasizing basic and applied research skills. This course will have research as its primary focus. Course content includes preparation of research studies, reports, and papers. Students are expected to generate a research project proposal on their own research topic as a final project.

Course Topics

- Overview of the research process
- Literature review
- Research qualitative methods
- Research quantitative methods
- Experimental design
- Proposal development
- Research ethics and validity

Course Outcomes

After taking this class, the student should be able to:

- Summarize and interpret a body of literature on a particular topic; identify gaps in the literature; write a literature review
- Formulate and motivate research questions
- Understand what research designs and research methods are available for empirical research
- Design empirical studies for different purposes (e.g., evaluating a tool, understanding a phenomenon); choose appropriate methods and defend the choice
- Analyze qualitative and quantitative data
- Run statistical tests and interpret results
- Draw conclusions from empirical data
- Present results verbally and in writing

Course Schedule

Check this **tentative course schedule (https://wwu.instructure.com/courses/1765416/pages/tentative-course-schedule)** .

Method of Instruction

The course will be run as a lab and seminar involving discussion and hands-on practice of research skills including research design, experimentation, qualitative analysis, and statistical analysis. Students will design a research project in the course, typically but not necessarily with their advisor. Assignments will include selected readings, research write-ups, as well as activities focused on supporting the materials reviewed in class.

Research Project

You will choose your project topic; I will not assign a project topic. The project can be part of your research with your advisor, or research you are doing for another class. I will set some milestones to be sure that you aren't caught at the end of the quarter with an incomplete project. A "complete" project by my definition consists of a proposal and research design, work materials (such as questionnaires, coding forms, etc.), pretest or pilot data analyses, and a draft write-up and presentation of preliminary results from pretests or pilot data. Ideally, this project will be the basis for a conference paper or journal publication.

Required Textbook

Booth, Wayne C., Gregory G. Colomb, and Joseph M. Williams. *The craft of research*. University of Chicago press, 5th Edition.

Recommended Readings

- Creswell, John W., and J. David Creswell. *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications, 2017.
- Cook, Thomas D., Donald Thomas Campbell, and William Shadish. *Experimental and quasi experimental designs for generalized causal inference*. Boston, MA: Houghton Mifflin, 2002.
- Wohlin, Claes, et al. *Experimentation in software engineering*. Springer Science & Business Media, 2012.
- Shull, Forrest, Janice Singer, and Dag IK Sjøberg, eds. *Guide to advanced empirical software engineering*. Springer Science & Business Media, 2007.

Research Ethics

All course projects that involve human subjects must comply with research ethics as described on WWU's Institutional Review Board (IRB)website:

https://rsp.wwu.edu/human-subjects-research ⤷ **(https://rsp.wwu.edu/human-subjects-research)**

You will not be able to publish any data which was not collected under the approved IRB.

Attendance and Class Participation Policy

Participating in discussions, answering questions, reading assigned texts before class, and participating during in-class activities are all good ways to show "active participation." You will miss credit for activities that took place during the classes you were absent. Being considerate of your fellow students in the classroom is also an important part of your class participation grade. You can do this by not causing a distraction for your fellow classmates -- you can remember to turn off your cell phone before class, arrive on time for class, avoid side conversation or noise during class, etc. A good learning environment is also one in which everyone feels welcome and comfortable; so, please be respectful of the diversity of backgrounds, beliefs, and lifestyles of the students in our class.

Be professional. Practice common courtesy when I or your fellow colleagues are speaking, which leads us to:

Keep your hands off the mouse/keyboard, unless of course we are doing something that requires you to use your computer. Please refrain from email, IM, Tweeting, browsing, and game play or use the computers in any other unprofessional manner while I or your fellow colleagues are speaking. Likewise for laptops and phones.

Statement on Reasonable Accommodations

Disability Resources for Students

Reasonable accommodation for persons with documented disabilities should be established within the first week of class and arranged through the Disability Access Center: telephone 360-650-3083; email drs@wwu.edu; and on the web at the **Disability Access Center** ⏵ **(https://disability.wwu.edu/)** . Review their **Documentation Guidelines** ⏵ **(https://disability.wwu.edu/documentation)** for the procedure for providing reasonable accommodations for students with disabilities.

Religious Accommodation

Students seeking such accommodation must provide written notice to their faculty within the first two weeks of the course, citing the specific dates for which they will be absent. "Reasonable accommodation" means that faculty will coordinate with the student on scheduling examinations or other activities necessary for completion of the course or program and includes rescheduling examinations or activities or offering different times for examinations or activities. Additional information can be found in **SB 5166: Providing religious accommodations for postsecondary students** ⏵ **(https://app.leg.wa.gov/billsummary?BillNumber=5166&Initiative=false&Year=2019)**

Return of Graded Work

Because of long written format of some of the assignment submissions in this course, more than two weeks may be required to return graded work to students, especially for the longer assignments. Your grades will be posted on Canvas during the quarter. If you have specific questions about your grade on an assignment, then the best way to proceed is to send an email with your question to the instructor. You should mention which problem/question you are referring to, and you should discuss why you feel the grade should be reexamined.

Academic Integrity Policy

It is admirable to communicate with others, but when you get information from others (web, people, publications), you must cite your sources in a reference list. Research ethics require attribution.

Please read WWU academic honesty policy (**https://syllabi.wwu.edu/** ⏵ **(https://syllabi.wwu.edu/)**)

Use of Generative AI

Use of generative AI tools such as ChatGPT is permitted in this course for minor writing support only —for example, fixing grammar, improving clarity, or finding synonyms. AI tools may not be used to generate content for literature reviews, research analysis, or any portion of your research paper. All submitted work must reflect your own original thinking, research, and writing. Misuse of AI tools will be considered a violation of academic integrity policies.

https://atus.wwu.edu/academic-uses-ai-students ⤷ **[(https://atus.wwu.edu/academic-uses-ai-students)](https://atus.wwu.edu/academic-uses-ai-students)**

Calculation of Final Grade

In-class activities	10%
Assignments	30%
Research analysis (writeup and presentation)	10%
Project deliverables	50%
Total	**100%**

Grade Calculation

A range: 100% – 90%

B range: 89% – 80%

C range: 79% – 70%

D range: 69% – 60%

Course Summary:

Date	Details	Due
Tue Apr 8, 2025	📝 **[List of research topics (https://wwu.instructure.com/courses/1765416/assignments/10173657)](https://wwu.instructure.com/courses/1765416/assignments/10173657)**	due by 10am
Tue Apr 15, 2025	📝 **[Project Deliverable 1: Problem Statement (https://wwu.instructure.com/courses/1765416/assignments/10173660)](https://wwu.instructure.com/courses/1765416/assignments/10173660)**	due by 10am
Tue Apr 22, 2025	📝 **[Research Analysis 1 (https://wwu.instructure.com/courses/1765416/assignments/10173665)](https://wwu.instructure.com/courses/1765416/assignments/10173665)**	due by 10am
Tue Apr 29, 2025	📝 **[Project Deliverable 2: Literature Review (https://wwu.instructure.com/courses/1765416/assignments/10173661)](https://wwu.instructure.com/courses/1765416/assignments/10173661)**	due by 10am