Syllabus
(Fa23)

CIT 490: Senior Research

Faculty: Yaser Mowafi, Ph.D.

Course Description
Students work on capstone research projects utilizing skills and knowledge from prior courses in the program. Projects performed, when possible, for a specific client or local industry.

Credit Hours: 3
Prerequisite: Consent of Instructor

Objectives and Learning Outcomes

This course contributes to the following outcomes:

1. an ability to identify, formulate, and solve information technology problems by applying principles of engineering, science, and mathematics
2. an ability to apply information technology design to produce solutions that meet specified needs with consideration of public safety and welfare, as well as cultural, social, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities and make informed judgments, which must consider the impact of information technology solutions in economic and societal contexts
5. an ability to establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Welcome!
Welcome to CIT 490 –Capstone Senior Research. My name is Yaser Mowafi, Ph.D. and I am anticipating a rewarding and fun experience.

Course Structure

The course allows students to contribute original work and/or ideas of a chosen CIT field theme (see Capstone Themes Section below) utilizing applied research methods. This course is primarily

oriented around producing a capstone project or research paper. Students will incorporate some dedicated time to work on the research work, and there will be assignments due at regular milestones. Students must submit their topic to their instructor for approval by the end of the second week of the academic semester. Once a topic is approved, students must submit the first draft of the capstone proposal by the end of the fifth week. The project will culminate a documentation that demonstrates a broader understanding of the chosen CIT discipline.

Topic Selection

Due to the technical nature of the capstone projects, students must submit their topics to the instructor for approval by the end of the second week of the academic semester. Once a topic is approved, students must submit the first draft of the capstone proposal by the end of the fifth week. A topic proposal has to:

- State a goal or a problem to be solved. For example, enable or apply a new product or service, produce new information for better decision-making or customer satisfaction.
- Offer a technology solution and explain how the technology will be implemented.
- Provide parameters to measure success.
- Refer to IT research, industry literature, and academic sources.

Students may form their own teams and each team will choose their own topic. Students can be allowed to form a group, if:
- Each student has contributed significantly to the completed work project in their work environment.
- Each student is able to submit proof of their significant involvement in their project.
- The instructor, based on the above criteria, approves the exemption and accepts the previous work products.

Students wishing to be considered for group projects must contact the instructor during the second week of the semester. If the exemption is granted, the students' project grade will be based on the submitted work using the same criteria as for the course project.

Final Paper: Outline & Writing Guidelines

The final paper for the capstone describes how information technology will help to achieve a work objective. The paper has three parts:

1. Problem statement/Business Requirement
2. Technical specifications
3. Implementation plan.

The paper size is limited to 25 pages.

See below links on research guides and "technical–academic" writing style:

https://libguides.usc.edu/writingguide/purpose
https://www.harvardwrites.com/
https://guides.library.harvard.edu/gsd/write/academic
https://owl.purdue.edu/owl/general_writing/common_writing_assignments/research_papers/index.html
https://writingcenter.fas.harvard.edu/pages/resources

Capstone Themes

Networking and Security: Students will work on enabling a computer networking and security themed product. The work will progress from product conception to requirements to design to implementation to evaluation. Work will incorporate key computer security tools and practices, including threat modeling, penetration testing, and bug fixing. Examples include password managers, censorship resistance systems, and mobile payment systems. Students will tie together and apply previous experiences from CIT 370, 372, 416, 472, 476, 482 and other classes.

Systems Development and Programming: Students will work to apply software engineering and system design skills towards building or enabling a novel computing application applied to computing scenarios. Students will follow a human-centered design process to ideate, design, and prototype or showcase their novel system. Students will tie together and apply previous experiences from CIT 330, 332, 432, 436, 456, 492 and other classes. This work gives hands-on experience with product cycle from design to deployment of computing application applied to computing scenario.

Database Administration and Data analysis: Students will focus on selecting a data science question and crafting and evaluating a data science process to answer that question. Students will work to apply end-to-end process of data management including transformation, exploration, modeling, and evaluation choices, performed with code: the iterative, and often exploratory, steps that analysts go through to turn data into results. The focus is not limited to the complete process, including transformation, exploration, modeling, and evaluation choices, but also to statistical modeling or machine learning, as well as visualization and database methods, Students will tie together and apply previous experiences from CIT 350, 352, 452, 454, 486, and other classes. This work gives hands-on experience with selecting a data science question, and with crafting and evaluating a data science process.

Instructor Information
Name: Yaser Mowafi, Ph.D.

Office: COHH, RM 2110

Email: yaser.mowafi@wku.edu Phone: Voice 270-745-3415

My office hours: By appointment.

Email is the best method of contact. I usually respond in less than 24 hours except on weekends. Please don't wait until the weekend. Note that if you try to contact me late on Friday, you will likely not get a response until late Sunday or early Monday.

Grading

Grade Distribution:

Research Project	Percentage
Research topic and problem definition	*10%*
Proposal Report	*20%*
Final Paper	*70%*
Total	*100%*

Grading Letter and Distribution:

A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	Below 60%

Grade Reporting
Students will be required to check Blackboard for posting of grades throughout the term.
Academic Dates
To determine important academic dates such as the last day to drop with a W, or the final exam schedule, please see https://www.wku.edu/restart/bigredrestartcalendar/

Work Submission
- All work must be submitted online via Blackboard.
- Any student found cheating or found to have plagiarized from other material (or using any materials) will receive a grade of 0 for that submission and may face further disciplinary action according to university policy.

Ogden Student Course Attendance Statement
The faculty and staff of Ogden College of Science and Engineering are committed to providing you with learning experiences and opportunities. You must assume ownership of your education and be an active participant in the classroom and laboratory to take advantage of these opportunities. Active participation requires you to attend. Scientific studies have shown that attendance during scheduled classroom and laboratory meetings is directly correlated to your performance on assignments and exams and the potential to earn higher grades. Additionally, if you do not regularly attend class, you are missing important information about course topics, due dates, and assignment details that are crucial to your success in the course. Therefore, as a student enrolled in an Ogden course, you are expected to attend every class meeting and to

inform your instructor regarding the reasons for any absences as soon as practical. **Your instructor may incorporate class attendance/participation as part of the grading criteria.**

Attendance Policy
Because this is an online course there is no classroom attendance requirement. However, I strongly encourage you to remain actively involved in this course. Some suggestions for doing this are: 1) check your WKU email and Blackboard regularly for course announcements and information; 2) stay abreast of all due dates as they are added to the course schedule on Blackboard; 3) complete all work on time and to the very best of your ability.

Incompletes
All incomplete requests must follow school guidelines. See the catalogue.

Extra Credit There is no extra credit or make-up work as the class assignments reflect what is required for successful completion of this course.

Outline

Week	You should be working on:	Deadlines
1	Introduction Start on topic selection	
2	Topic selection	Research Topic
3	Problem Definition Start on proposal draft	
4	Structured requirements	Status Report
5	Structured requirements	Proposal Report
6	Structured requirements Start on analysis	Resubmit Proposal Report
7	Analysis	
8	Analysis	
9	Analysis Start on modeling and design Paper	Status Report
10	Modeling and design	
11	Modeling and design	
12	Modeling and design Start on final research paper	Status Report
13	Final research paper	

| 14 | Final research paper | Final Research Paper |
| 15 | Catch-up time | Resubmit Final Research Paper |

Note: The deadlines below allow for some slack in completion of the content areas. If you cover the content at the pace indicated above in the recommended schedule, you should be able to complete all assignments well ahead of the deadline, as recommended. Thus, the deadlines below should be considered "drop dead", or absolute latest dates. All assignments are due by **midnight** on the due date.
No extensions will be granted, and no credit will be given for late submissions.

Academic Standards
I expect all students to support the same respect for individuals, commitment to issue and problem resolution, and open communication and feedback as in any learning environment. Specifically, all students are expected to:
- Accept responsibility and accountability for all use actions and content posted to any online classroom, public meeting or personal inbox (email).
- Maintain the same ethical standards expected in a collaborative, academic environment.
- Demonstrate respect for all faculty, students, and staff regardless of age, race, gender, religion, national origin, veteran's status, disability, or sexual orientation.

In the online environment, the following will not be tolerated:
- Harmful, threatening, libelous, or abusive content.
- Profanity of any kind.
- Copyright infringement or violation of patent, trademark, proprietary information, or confidentiality agreements.
- Misrepresentation of identity through alteration of inbox (email) names.
- Posting unsolicited advertisements to public meetings or private inboxes- no spamming!
- Transferring computer viruses, intentionally or unintentionally, or other code that disrupts or interferes with other users' use of the online environment or personal computers, systems, or networks.

Honesty
I highly value academic honesty. Please see https://www.wku.edu/studentconduct/process-for-academic-dishonesty.php
A student must always submit work that represents his or her original words or ideas. If any words or ideas are used that do not represent the student's original words or ideas, then the student must cite all relevant sources. The student should also make it clear the extent to which such sources are used.
Words or ideas that require citation include, but are not limited to, all hardcopy or electronic publications, whether copyrighted or not, and all verbal or visual communication when the content of such communication clearly originates from an identifiable source.

All submissions to any public meeting or private mailbox fall within the scope of words and ideas that require citations if used by someone other than the original author.

Academic dishonesty in an Online learning environment could involve the following:

- Having a tutor or friend complete a portion of your assignments
- Having a reviewer make extensive revisions to an assignment
- Copying work submitted by another student to a public class meeting
- Using information from on-line information services without proper citation

Any of these practices could result in charges of academic dishonesty. Sanctions range from failing assignment or class grades to expulsion.

I consider academic honesty a very serious issue. I have and will fail students that I discover are not adhering to the above guidelines.

Class Navigation

Go to http://blackboard.wku.edu and follow the login instructions (usually available by the first day of class). This site will be the primary means for quizzes, grades, announcements, exam and homework scores, reading materials, discussions, and other supplemental course information that you will need. Please be sure and check this site regularly.

Computer Access

This class requires each student to make use of several software packages, various other software tools and the Internet. All required resources are available either in the general Student Computer Labs across campus, on WKU Extended campuses, and typically, at public libraries. Lack of hardware, software and Internet connectivity at home to complete any assignment is not an acceptable reason for not completing work. You may work from any location you prefer (home, work, etc…), but you will need access to MS Office software.

Technology Issues

School servers are unavailable from time-to-time. Accordingly, I will accept e-mailed assignments to my personal mailbox for time-stamping purposes only. However, once Blackboard is available to you, in order to receive a grade, the assignment must be posted to the designated discussion board as detailed in this syllabus.

Please make sure that you have a reliable network connection prior to your attempts to take online exams, to avoid any Blackboard system lock-up during a quiz or exam. If this happens, please contact me as soon as possible. Also, from time to time the Blackboard system will lock-up during a quiz or exam. If this happens, please contact me as soon as possible. I can only reset the exam, which means you will have to take it over (this includes final exams). If you wait until the last minute to take an exam, you may not be able to reset due to time limitations.

For comments/complaints about technology issues (for example, Blackboard exam problems), please contact the Office of the Chief Information Technology Officer (270-745-2243). http://www.wku.edu/infotech/index.php?page=VP

Late Assignments

Due to the nature of this course and based upon my teaching experience, it is critical that you are timely in submitting the assignments. Since all assignments are made available before they are due, no late work will be accepted for any reason. Again, no late work will be accepted for any reason. Please do not wait until the last minute to do your assignments; no late work will be accepted for any reason.

Cancellations

If you are dropped for any reason (lack of payment, etc.), your access to Blackboard may be terminated. In this event you will **NOT** be permitted to make up on-line course assignments/activities during the time you lost access to Blackboard.

Student Disability

Services Students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for this course must contact the Office for Student Disability Services, Room 445, Potter Hall. The OFSDS telephone number is (270) 745-5004 V/TDD.
Please DO NOT request accommodations directly from the professor or instructor without a letter of accommodation from the Office for Student Disability Services.

Title IX Misconduct/Assault Statement

Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) at https://wku.edu/eoo/documents/titleix/wkutitleixpolicyandgrievanceprocedure.pdf and
Discrimination and Harassment Policy (#0.2040) at https://wku.edu/policies/hr_policies/2040_discrimination_harassment_policy.pdf.
Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121.
*Please note that while you may report an incident of sex/gender-based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and **MUST** report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.*

ADA Accommodation Statement

In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at sarc.connect@wku.edu . Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

The Learning Center Peer Tutoring Services

The Learning Center (TLC) provides free tutoring services that empower students to achieve academic success. Trained peer tutors are available to review course content, answer questions, and demonstrate effective study strategies. TLC offers individual appointments and group sessions (PASS) for hundreds of undergraduate courses. For more information or to make an appointment, visit www.wku.edu/tlc

Schedule Exceptions
I will not approve any schedule exceptions.