Knight Foundation School of Computing and Information Sciences

Course Title: Internship Ready Software Development **Date:** 1/1/2024

Course Number: CIS 3XXX

Number of Credits: 0

Subject Area: XX	**Subject Area Coordinator:** XX **email:** XX@fiu.edu
Catalog Description: Gain effective hard and soft skills for a successful software engineering internship. Topics covered include software version control, project management, open-source development, and AI.	
Textbooks: TBD	
References: TBD	
Prerequisites Courses: COP 2210 or COP 2250 or equivalent	
Corequisite Courses: COP 3337 or COP 3804 or equivalent	

Type: Zero Credit Elective for CS, IT, Cybersecurity, and Data Science Majors

Prerequisites Topics:

1. Fundamental programming
    a. Objects, Classes, and fundamental Data Types
    b. Arrays, Strings, and Functions
2. Taking a course with Data Structures as co-requisite
3. Oral and written communication skills

Course Outcomes:

1. Apply the best practices for effective project management techniques (Applying).
2. Analyze various strategies and tools for developing a successful software development project (Analyzing).
3. Apply version control for software development (Applying).
4. Recognize the importance of version control in maintaining code (Remembering).
5. Evaluate the advantages and challenges of open-source software development (Evaluating).

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Relationship between Student Outcomes and Course Outcomes

Student Outcomes	Course Outcomes
1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.	1,2,3
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	1,2,5
3. Communicate effectively in a variety of professional contexts.	1,3,4
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.	2,5
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.	1,3,5

Assessment Plan for the Course and how Data in the Course are used to assess Student Outcomes

Student and Instructor Course Outcome Surveys are administered at the conclusion of each offering, and are evaluated as described in the School's Assessment Plan: https://abet.cis.fiu.edu/.

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Outline

Topic	No. of Lecture Hours	Course Outcomes
Version control with Git and GitHub		
• Describe why version control is a fundamental tool for coding and collaboration • Install and run Git on your local machine • Perform common tasks in GitHub. • Collaborate with others through remote repositories • Command-line interface / Integrations with various IDEs Assessment: • Managerial-style review of policies and feedback: o Was a repository created? o Does it follow guidelines? o Is it secure? o Is it properly described? o Are the commits properly described?	5	1,2,3
Open-Source Development		
• Define what open-source software is. • Identify the benefits OSS has provided to the world's technology infrastructure. • Describe collaboration best practices. • Encourage skill diversity in teams working on open-source projects. • Describe common methods, such as Continuous Integration and using GitHub and other hosting providers. Assessment: • Managerial-style review and progress report: o Were relevant OSS properly identified and researched? o Was a proper licensing selected? o Were the policies of the selected OSS reviewed? o What are the challenges and opportunities?	5	1,2,4
Project Management		
• Adopt the 5 practices of Agile, a subset of DevOps: small batches, minimum viable product, pair programming, behavior- and test-driven development. • Write good user stories, estimate, and assign story points and track stories using a Kanban board. Incorporate Scrum artifacts, events, and benefits. • Create and refine a product backlog using the sprint planning process. Produce potentially shippable product increments with every iteration. • Create burndown charts to forecast the ability to meet a sprint goal. Use metrics to enhance performance, productivity, and client satisfaction.	10	1,2

• Describe the five important Scrum events and how to set up each event for a Scrum team.
Assessment:
• Managerial-style product review:
  ○ Review of User Stories
  ○ Were the sprints and daily stand ups set appropriately?
  ○ Are they using appropriate tools?		

Special Topics Reviews		

• Learn the general concepts of data visualization along with basic methodologies and applications.
• Implement Dashboards using open-source and proprietary tools.
• Identify the best patterns for data visualization of numerical and non-numerical data.
• Practice best strategies for communication of results.
• Give a pitch
Assessment:
• Managerial-style review:
  ○ Feedback on presentation
  ○ Was the audience properly identified and addressed?
  ○ Was there any area for improvement?
	2	1,2

• Recognize the opportunities and challenges of the applications of Artificial Intelligence in software development.
• Evaluate Machine Learning Models.
• Using application programming interfaces (APIs) to transform data.
• Identify the best practices for the safe use of AI.
Assessment:
• Technology review:
  ○ Are all the risks and opportunities identified?
  ○ Are APIs used effectively?
  ○ Is there a plan for testing and deployment?
	3	1,2

Guided Development		

• Execute the proposed plan of a project.
• Implement the best practices of project management in a real-case scenario.
• Perform version control of a project using GitHub.
• Manage the scope of your project based on the current timeline.
Assessment:
• Code review:
  ○ Does the code follow guidelines?
  ○ Is it properly documented?
  ○ Has it been properly tested?
	15	1,2

• Perform a product presentation to a general audience. • Implement the best practices of technical communication	5	1

Assessment: • Start-up-style pitch review: o Feedback on presentation o Was the audience properly identified and addressed? o Did the solution address all the requirements?		

Performance Measures for Evaluation

Assignment	Total Points	Percentage of Final Grade
Use Scrum / Agile to Manage your Project	30	26%
Use an API and write code to implement features described in User Stories	30	26%
Apply Version Control Effectively	20	17%
Join an Open Source Project and Contribute to it	20	17%
Final Reflection	15	14%
	Total	100%

All assignments must be completed at least 80% score to gain the micro-credential badge.

Letter Grade Distribution Table

Letter	Range%	Letter	Range%	Letter	Range%
A	93 or above	B	82 – 85.9	C	70 – 73.9
A-	90 – 92.9	B-	78 – 81.9	D	60 – 69.9
B+	86 – 89.9	C+	74 – 77.9	F	Less than 60

Oral and Written Communication:

The final presentation may include a poster, presentation, and / or written report.

Social and Ethical Implications of Computing Topics:

Proper use of Open-Source Licenses

Theoretical Contents:

No Significant Coverage

Problem Analysis Experiences:

No Significant Coverage