Knight Foundation School of Computing and Information Sciences

Course Title: Capstone I   **Date:** 12/20/2022

Course Number: CIS 3950

Number of Credits: 1

Subject Area: Knowledge focus groups covered in the curriculum of the BS in Computer Science.	**Subject Area Coordinator:** Masoud Sadjadi **email:** sadjadi@fiu.edu
Catalog Description: Students learn how to perform efficiently in Agile/Scrum teams of up to 5 members and learn how to design and implement solutions to problems as a team.	
Textbook: No text book required	
References:	
Prerequisites Courses: (COP 3337 or COP 3804) and Junior Standing	
Corequisites Courses: None	

Type: Required

Prerequisites Topics:

- Programming knowledge.

Course Outcomes:

1. Demonstrate the ability to work effectively in a project team.
2. Demonstrate familiarity of formulating problems.
3. Demonstrate familiarity of specifying the requirements of a problem.
4. Demonstrate familiarity of designing the solution to a problem.
5. Demonstrate familiarity of realizing the solution to a problem.
6. Demonstrate familiarity to validate and evaluate the solution to a problem.
7. Demonstrate familiarity to manage a semester long project.
8. Demonstrate familiarity to think logically and critically when developing the solution to a given problem.
9. Demonstrate familiarity to apply concepts learned in various courses when developing the solution to a given problem.
10. Demonstrate familiarity to communicate the details of the technical solution through verbal and written modes.
11. Demonstrate familiarity to incorporate ethical issues into the project development and documentation process.

Association between Student Outcomes and Course Outcomes

BS in Computing: Student Outcomes	Course Outcomes
1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.	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.	4, 5, 6
3) Communicate effectively in a variety of professional contexts.	10
4) Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.	11
5) Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.	1, 7

Program Specific Student Outcomes

6) Apply computer science theory and software development fundamentals to produce computing-based solutions. [CS]	8, 9

6) Apply security principles and practices to maintain operations in the presence of risks and threats. [CY]	8, 9

6) Use systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to accomplish user goals. [IT]	8, 9

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	Number of Lecture Hours	Course Outcomes

• Project management
  o Organization
  o Planning
  o Monitoring
	2	1, 2, 7, 8, 10, 11

• Problem Formulation
  o Motivation
  o Problem feasibility
  o Problem statement
	2	1, 2, 7, 8, 10

• Requirements Specification
  o Domain analysis
  o Objectives of the solution
  o Validation adequacy criteria
	2	1, 3, 7, 8, 9, 10, 11

• Design
  o Formulation of a plan to implement requirements
  o Limits on scope of solution
	2	1, 4, 6, 7, 8, 9, 10

• Realization o Realize solution from design	2	1, 5, 6, 7, 8, 9, 10

• Validation/Evaluation
  o Check solution against requirements using adequacy criteria
  o Compare solution to alternative solutions.
	2	1, 6, 7, 8, 9, 10

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Course Outcomes Emphasized in Laboratory Projects/ Assignments

Outcome	Number of Weeks
1. Project Plan Outcomes: 1, 2, 7, 8, 10, 11	variable 1 - 2
2. Requirements Specification Outcomes: 1, 2, 7, 8, 10, 11	variable 1 - 2
3. Solution Design Outcomes: 1, 3, 7, 8, 9, 10	variable 1 - 2
4. Final Project Outcomes: 1,2,3,4,5,6, 7, 8, 9, 10, 11	variable 1 - 2

Oral and Written Communication:

Written Reports		Oral Presentations	
Number Required	Approx. Number of pages	Number Required	Approx. Time for each
4 (Project Plan, Requirements Document, Design Document, Final Project Document)	Variable (1-30)	at least 3 no more than 5	15 minutes per group (5 minutes per student)

Social and Ethical Implications of Computing Topics

Topic	Class time	Student performance measures
Intellectual property - Patents, trademarks, copyrights of other similar products, and licensing of final product		Written reports - Requirements document and Final Project Document.
Privacy - privacy protection		Written reports - Requirements document and Final Project Document.
Economic issues - pricing strategies		

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Approximate number of credit hours devoted to fundamental CS topics

Topic	Core Hours	Advanced Hours
Algorithms:	0.2	
Software Design:	0.2	
Computer Organization and Architecture:	0.2	
Data Structures:	0.2	
Concepts of Programming Languages	0.2	

Theoretical Contents

Topic	Class time

Problem Analysis Experiences

Feasibility study of alternative solutions
Specifying the requirements for a problem
Analyzing the requirements of a problem

Solution Design Experiences

Designing the solution to a problem
Techniques to validate the problem solution

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The Coverage of Knowledge Units within Computer Science Body of Knowledge[1]

Knowledge Unit	Topic	Lecture Hours
AL	Algorithms and Complexity	variable (1-2)
AR	Architecture and Organization	variable (1-2)
IM	Information Management	variable (1-2)
NC	Net-Centric Computing	variable (1-2)
OS	Operating Systems	variable (1-2)
PL	Programming Languages	variable (1-2)
SE	Software Engineering	variable (1-2)
SP	Social and Professional Issues	variable (1-2)

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[1]See https://www.acm.org/binaries/content/assets/education/cs2013_web_final.pdf for a description of Computer Science Knowledge units