DO NOT TYPE IN THIS BOX

Bulletin # : 3

Academic Year : 2019-20

FLORIDA INTERNATIONAL UNIVERSITY
UNIVERSITY CURRICULUM COMMITTEE
Proposal for a New Course

1. **School/College** Engineering and Computing

   Div./Dept. in Which Taught School of Computing and Information Sciences

2. CIS (Alpha Prefix) | 3 (1st Digit) | XXX (Last 3 Digits) | ____ ("C"-lec-lab "L"-Lab) | 1 (Cr. Hrs.)

   CIP Code *(Leave this blank):* ____

CIS 3950

3. **Grading Method (select one):** ☒ Graded ☐ Pass/Fail

4a. **Course Title** Capstone I

b. **Abbreviated course Title** *(for computer class schedules, transcripts)* Capstone I

LIMITED TO 25 Characters *(including spaces)*

5. **Statewide Course Numbering Subject Matter Area** Computer Information Systems

6. **Catalog Description/Major Topics** *(not to exceed 200 characters including spaces)*

College of Medicine and College of Law: Attach description not exceeding 1,000 characters including spaces.

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.

7. **Attach detailed syllabus course outline and course justification on separate page(s).**
8. **Prerequisite(s):** COP 3337 (Programming II) and Junior standing
9. **Corequisite(s):** ____
10. **Objective(s) of Course:**

11. **Does this course duplicate/overlap other courses at FIU?** ☒ No ☐ Yes
    If yes, please explain: ____
12. **What other closely related department(s) have been consulted about this course?** ____
13. **Is this course used for the assessment of a program or a certificate (if yes, then send a notification to assessment@fiu.edu)?** No Yes

PROPOSAL REQUESTED BY:

Faculty Contact	Masoud Sadjadi (Type name)	(Signature)	11 / 25 / 2019
	sadjadi@cs.fiu.edu (Email address)	305-348-1835 (Phone number)	
Chairperson (Dept./Div.)	S.S. Iyengar (Type name)	(Signature)	11 / 25 / 2019
Chairperson (Curr. Comm.)	Wei-Chiang Lin (Type name)	(Signature)	11 / 29 / 2019
College/School Dean	John Volakis (Type name)	(Signature)	12 / 10 / 2019

Submit one original form. Attach one copy of the course justification and course syllabus, course description, objectives, major topics and textbooks.

CIS-3XXX Capstone I

New Course Justification

Currently, CS majors take the senior project in their last term. Since completing the senior project in one term demands a significant of time, students are unable to take other classes in the last term. To balance the course load and to improve the graduation rate, it is necessary to complete the senior project in two terms with a 1-credit "Capstone I" followed by a 2-credits "Capstone II".

This new 1-credit course "Capstone I" allows students to understand the technologies needed for their capstone project and plan a strategy for their chosen project. The prerequisite "COP3337 (Programming II) and Junior standing" will ensure students have completed the basic required courses to begin their capstone project.

Students who are admitted before Fall 2020 are also strongly encouraged to take Capstone I and II, but to accommodate them, they are allowed to fulfill the capstone requirement by completing IDS-4918 ("Vertically Integrated Projects C" 3-credits) in one term.

School of Computing and Information Sciences

Course Title: Capstone I **Date:** 11/22/19

Course Number: CIS 3XXX

Number of Credits: 1

Subject Area: Knowledge focus groups covered in the curriculum of the BS in Computer Science.	**Subject Area Coordinator:** Monique Ross **email:** moross *a* 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 (Programming II) 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.

School of Computing and Information Sciences
CIS-3XXX
Capstone I

Relationship between Course Outcomes and Program Outcomes

BS in CS: Program Outcomes	Course Outcomes
a) Demonstrate proficiency in the foundation areas of Computer Science including mathematics, discrete structures, logic and the theory of algorithms	1, 2, 3, 4, 5, 9
b) Demonstrate proficiency in various areas of Computer Science including data structures and algorithms, concepts of programming languages and computer systems.	1, 2, 3, 4, 5, 8, 9
c) Demonstrate proficiency in problem solving and application of software engineering techniques	1, 2, 3, 4, 5, 6, 7, 8, 9
d) Demonstrate mastery of at least one modern programming language and proficiency in at least one other.	4, 9
e) Demonstrate understanding of the social and ethical concerns of the practicing computer scientist.	11, 9
f) Demonstrate the ability to work cooperatively in teams.	7
g) Demonstrate effective communication skills.	10, 9

Assessment Plan for the Course and how Data in the Course are used to assess Program 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: http://www.cis.fiu.edu/programs/undergrad/cs/assessment/

School of Computing and Information Sciences
CIS-3XXX
Capstone I

Outline

Topic	Number of Lecture Hours	Outcome
• Project management ○ Organization ○ Planning ○ Monitoring	2	1, 2, 7, 8, 10, 11
• Problem Formulation ○ Motivation ○ Problem feasibility ○ Problem statement	2	1, 2, 7, 8, 10
• Requirements Specification ○ Domain analysis ○ Objectives of the solution ○ Validation adequacy criteria	2	1, 3, 7, 8, 9, 10, 11
• Design ○ Formulation of a plan to implement requirements ○ Limits on scope of solution	2	1, 4, 6, 7, 8, 9, 10
• Realization ○ Realize solution from design	2	1, 5, 6, 7, 8, 9, 10
• Validation/Evaluation ○ Check solution against requirements using adequacy criteria ○ Compare solution to alternative solutions.	2	1, 6, 7, 8, 9, 10

School of Computing and Information Sciences
CIS-3XXX
Capstone I

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		

School of Computing and Information Sciences
CIS-3XXX
Capstone I

Approximate number of credit hours devoted to fundamental CS topics

Topic	Core Hours	Advanced Hours
Algorithms:	**0.5**	
Software Design:	**0.5**	
Computer Organization and Architecture:	**0.5**	
Data Structures:	**0.5**	
Concepts of Programming Languages	**0.5**	

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

School of Computing and Information Sciences
CIS-3XXX
Capstone I

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)

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