School of Computing and Information Sciences

Course Title: Introduction to Game Design & Development **Date:** 3/5/2020

Course Number: CAP 4052

Number of Credits: 3

Subject Area: Computer Applications	**Subject Area Coordinator:** Leonardo Bobadilla **email:** bobadilla@cs.fiu.edu
Catalog Description: Introduction to game design and development concepts such as iterative design, prototyping, playtesting, game structure, game rules and mechanics, game theory, game system dynamics, and game balance.	
Textbook: Fullerton – Game Design Workshop, 4th Edition, CRC Press, 2018, 978-1138098770	
References:	
Prerequisites Courses: (STA-2023 or STA-3033) and COP-3530 and CAP-4104	
Corequisite Courses: None	

Type: Elective for CS (Applications group).

Prerequisites Topics:

1. Familiar with techniques of algorithm analysis and problem solving
2. Significant programming experience in a modern programming language
3. Familiar with encapsulation using functions
4. Familiar with concepts of probability
5. Familiar with arrays, pointers, dynamic memory, multiprocessing

Course Outcomes:

1. Be familiar with the history and types of games.
2. Be familiar with the iterative game design process.
3. Be familiar with prototyping and playtesting.
4. Be familiar with game system dynamics.
5. Be familiar with game rules and mechanics.
6. Be exposed to game theory.
7. Be exposed to game balance and completeness.
8. Master development of games to address topics in the above outcomes.

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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	6, 8
b) Demonstrate proficiency in various areas of Computer Science including data structures and algorithms, concepts of programming languages and computer systems.	8
c) Demonstrate proficiency in problem solving and application of software engineering techniques	2, 3, 4, 5, 8
d) Demonstrate mastery of at least one modern programming language and proficiency in at least one other.	8
e) Demonstrate understanding of the social and ethical concerns of the practicing computer scientist.	
f) Demonstrate the ability to work cooperatively in teams.	8
g) Demonstrate effective communication skills.	2, 3, 4, 5, 7

Assessment Plan for the Course & 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/

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Outline

Topic	Number of Lecture Hours	Outcome
1. Introduction to Games 1.1. Brief History 1.2. Types of games 1.3. Iterative design process 1.4. Prototyping and playtesting	10	1, 2, 3
2. Game Rules and Mechanics 2.1. Players 2.2. Objectives 2.3. Procedures 2.4. Rules	10	4, 8
3. Game Actions 3.1. Goals and feedback 3.2. Game time and levels 3.3. Story and world building	5	5, 8
4. System Dynamics 4.1. Terminology 4.2. Information structure 4.3. Control and feedback 4.4. Interaction loops and arcs	5	4, 8
5. Game Theory 5.1. History 5.2. Basics	3	6
6. Game Balance 6.1. Completeness 6.2. Balance	5	7, 8

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Course Outcomes Emphasized in Laboratory Projects / Assignments

Outcome	Number of Weeks
Introduction to games 1, 2, 3	2
Game rules and mechanics 4, 8	2
Game actions 5,8	2
System dynamics 4,8	2
Game theory 6	2
Game balance and completeness 7,8	2

Oral and Written Communication

No significant coverage

Written Reports		Oral Presentations	
Number Required	Approx. Number of pages	Number Required	Approx. Time for each
0	0	0	0

Social and Ethical Implications of Computing Topics

No significant coverage

Topic	Class time	student performance measures

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Approximate number of credit hours devoted to fundamental CS topics

Fundamental CS Area	Core Hours	Advanced Hours
Algorithms:		
Software Design:		
Computer Organization and Architecture:		
Data Structures:		
Concepts of Programming Languages		

Theoretical Contents

Topic	Class time

Problem Analysis Experiences

Solution Design Experiences

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

Knowledge Unit	Topic	Type	Lecture Hours

[1]See Appendix A in Computer Science Curricula 2013 at:
https://www.acm.org/binaries/content/assets/education/cs2013_web_final.pdf