Knight Foundation School of Computing and Information Sciences

Course Title: Introduction to Human-Computer Interaction   **Date:** 5/7/2020

Course Number: CEN 3721

Number of Credits: 3

Subject Area: Computer Systems	Subject Area Coordinator: Antonio Hernandez email: antherna@fiu.edu
Catalog Description: Fundamental concepts of human-computer interaction, cognitive models, user-centered design principles and evaluation, emerging technologies.	
Textbook: The Humane Interface Raskin, Addison-Wesley, (ISBN: 0201379376), About Face 3.0: The Essentials of Interactive Design, Cooper, Reimann, Cronin, Wiley (3rd edition, ISBN 978-0470084113)	
References: Designing Interactive Systems: People, Activities, Contexts, Technologies, David Benyon, Phil Turner, and Susan Turner, Addison Wesley (ISBN: 0321116291), 2005	
Prerequisites Courses: COP 2210 or COP 2250 or equivalent	

Type: Required for BS-in-IT

Prerequisites Topics:

- Basics of perception, cognition, and memory
- Basic program control structures
- Basic concepts of data organization

Course Outcomes:

1. Be familiar with the essentials of computer system design
2. Be exposed to human-centered computing concepts and principles
3. Be exposed to principles and practices of interactive system design
4. Be familiar with the human information processing mechanisms
5. Master computer interaction design for single user interaction
6. Be familiar with embodied, situated and distributed cognition
7. Master activities behind interactive design
8. Be exposed to psychological foundations for interactive system design of the future

Knight Foundation School of Computing and Information Sciences
CEN 3721
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Outline

Topic	Number of Lecture Hours	Outcome

• Essential Interactive Design System
  o Varieties of interactive Systems
  o Framework for design
  o Skills of the interactive systems designer
  o Importance of human-centered computing
• People, Activities and Contexts
  o Accessibility, Usability, Acceptability, Engagement
  o Design Principles
	6	1,2

• Understanding People 1: Introduction to cognitive psychology and human information processing
  o Seven-stage activity
  o Memory
  o Attention
  o Visual perception
  o Gestalt laws of perception
  o Depth perception
  o Color
  o Mental models
  o Virtual reality
	3	2,4

• Supporting Single User Interaction
  o User interfaces
  o Graphical user interfaces
  o Input devices
  o Output devices
  o Multimodal Human-Computer Interfaces
	3	2,5

• Understand People 2 : Embodied, Situated and Distributed Cognition
  o Ergonomics
  o Avatars
  o Embodied Conversational Agents
  o Affordance
	6	4,8

• Activities and Contexts of Interactive Systems Design
   o Scenarios
   o Requirements
   o Prototyping
   o Evaluation
   o Conceptual and Physical Design
	10	7

• Psychological Foundations
   o Memory, attention, and making mistakes
   o Hearing and Haptics
   o Affective Computing and Pleasure
   o Intelligent User Modeling
	6	4,6,8

• Techniques for Interactive Systems Design and Evaluation
   o Contextual Design, interview and work modeling
   o Task Analysis
   o Generic techniques and current issues
   o Software characters, intelligent agents and special contexts
	4	7, 8

Course Outcomes Emphasized in Laboratory Projects / Assignments

	Outcome	Number of Weeks
1	Home Information Center Outcomes: 2,3,4,5	2
2	Single User Interaction System Design Outcome: 7	3
3	Innovative System Prototyping Outcomes: 6,8	2

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: https://abet.cs.fiu.edu/csassessment/

Oral and Written Communication
Some coverage

Social and Ethical Implications of Computing Topics
Some coverage

Approximate number of class credit hours devoted to fundamental CS topics

Topic	Core Hours	Advanced Hours
Algorithms:		
Software Design:	2.0	1.0
Computer Organization and Architecture:		
Data Structures:		
Concepts of Programming Languages		
Other CS Topics:		

Theoretical Contents

Topic	Class time

Problem Analysis Experiences

1.	Human Information Processing Analysis
2.	Task Analysis

Knight Foundation School of Computing and Information Sciences
CEN 3721
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Solution Design Experiences

1.	Single User Interaction Design
2.	Innovative Interaction Prototyping

The Coverage of Knowledge Units within Information Technology Body of Knowledge[1]

Knowledge Unit	Topic	Lecture Hours
HC1	Human factors: cognitive principles, understanding the user, designing for humans	6
HC2	HCI aspects of application domains: type of environments, cognitive models, approaches	6
HC3	Human-centered evaluation: heuristics, usability testing and standards	6
HC4	Developing effective interfaces: understanding interaction styles, matching interface elements to user requirements, GUIs and non-GUI interfaces, prototyping	6
HC5	Accessibility: biometrics, repetitive stress syndrome, guidelines and regulations	2
HC6	Emerging Technologies: alternative input/output devices, mobile computing, wearable computing, virtual reality systems, pervasive computing, sensor-nets	6
HC7	Human-Centered Computing: human-centered design methods, software development lifecycle, user analysis of profiles and personas, social computing, task analysis, scenarios, uses cases	6

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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