

## School of Computer Science

**Course Title:** Introduction to Human-Computer Interaction

**Date:** 8/16/11

**Course Number:** CEN-3721

**Number of Credits:** 3

<b>Subject Area:</b> Computer Systems	<b>Subject Area Coordinator:</b> Christine Lisetti <b>email:</b> lisetti@cis.fiu.edu
<b>Catalog Description:</b> Fundamental concepts of human-computer interaction, cognitive models, user-centered design principles and evaluation, emerging technologies.	
<b>Textbook:</b> The Humane Interface Raskin Addison-Wesley, (ISBN: 0201379376) About Face 3.0: The Essentials of Interactive Design Cooper, Reimann, Cronin Wiley (3 <sup>rd</sup> edition, ISBN 978-0470084113)	
<b>References:</b> Designing Interactive Systems: People, Activities, Contexts, Technologies David Benyon, Phil Turner, and Susan Turner Addison Wesley (ISBN: 0321116291), 2005	
<b>Prerequisites Courses:</b> COP2210 or COP2250 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

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**Outline**

<b>Topic</b>	<b>Number of Lecture Hours</b>	<b>Outcome</b>
<ul style="list-style-type: none"> <li>• Essential Interactive Design System               <ul style="list-style-type: none"> <li>○ Varieties of interactive Systems</li> <li>○ Framework for design</li> <li>○ Skills of the interactive systems designer</li> <li>○ Importance of human-centered computing</li> </ul> </li> <li>• People, Activities and Contexts               <ul style="list-style-type: none"> <li>○ Accessibility, Usability, Acceptability, Engagement</li> <li>○ Design Principles</li> </ul> </li> </ul>	6	1,2
<ul style="list-style-type: none"> <li>• Understanding People 1: Introduction to cognitive psychology and human information processing               <ul style="list-style-type: none"> <li>○ Seven-stage activity</li> <li>○ Memory</li> <li>○ Attention</li> <li>○ Visual perception</li> <li>○ Gestalt laws of perception</li> <li>○ Depth perception</li> <li>○ Color</li> <li>○ Mental models</li> <li>○ Virtual reality</li> </ul> </li> </ul>	3	2,4
<ul style="list-style-type: none"> <li>• Supporting Single User Interaction               <ul style="list-style-type: none"> <li>○ User interfaces</li> <li>○ Graphical user interfaces</li> <li>○ Input devices</li> <li>○ Output devices</li> <li>○ Multimodal Human-Computer Interfaces</li> </ul> </li> </ul>	3	2,5
<ul style="list-style-type: none"> <li>• Understand People 2 : Embodied, Situated and Distributed Cognition               <ul style="list-style-type: none"> <li>○ Ergonomics</li> <li>○ Avatars</li> <li>○ Embodied Conversational</li> </ul> </li> </ul>	6	4,8

<ul style="list-style-type: none"> <li>Agents <ul style="list-style-type: none"> <li>○ Affordance</li> </ul> </li> </ul>		
<ul style="list-style-type: none"> <li>● Activities and Contexts of Interactive Systems Design <ul style="list-style-type: none"> <li>○ Scenarios</li> <li>○ Requirements</li> <li>○ Prototyping</li> <li>○ Evaluation</li> <li>○ Conceptual and Physical Design</li> </ul> </li> </ul>	10	7
<ul style="list-style-type: none"> <li>● Psychological Foundations <ul style="list-style-type: none"> <li>○ Memory, attention, and making mistakes</li> <li>○ Hearing and Haptics</li> <li>○ Affective Computing and Pleasure</li> <li>○ Intelligent User Modeling</li> </ul> </li> </ul>	6	4,6,8
<ul style="list-style-type: none"> <li>● Techniques for Interactive Systems Design and Evaluation <ul style="list-style-type: none"> <li>○ Contextual Design, interview and work modeling</li> <li>○ Task Analysis</li> <li>○ Generic techniques and current issues</li> <li>○ Software characters, intelligent agents and special contexts</li> </ul> </li> </ul>	4	7, 8

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**Course Outcomes Emphasized in Laboratory Projects / Assignments**

	<b>Outcome</b>	<b>Number of Weeks</b>
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

**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**

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

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**Theoretical Contents**

Topic	Class time

**Problem Analysis Experiences**

- |    |                                       |
|----|---------------------------------------|
| 1. | Human Information Processing Analysis |
| 2. | Task Analysis                         |

**Solution Design Experiences**

- |    |                                    |
|----|------------------------------------|
| 1. | Single User Interaction Design     |
| 2. | Innovative Interaction Prototyping |

**The Coverage of Knowledge Units within Information Technology Body of Knowledge<sup>1</sup>**

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

<sup>1</sup>See [www.computer.org/portal/cms\\_docs\\_ieeeecs/ieeeecs/education/cc2001/cc2001.pdf](http://www.computer.org/portal/cms_docs_ieeeecs/ieeeecs/education/cc2001/cc2001.pdf) for a description of Computer Science Knowledge units