

**CSC 212 Human-Computer Interfaces (formerly CSC 312A)**

**4 cr.**

**Instructor:** TBA  
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**Office:** location  
**Office Hours:** days and times

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| Section | Time           | Room     | Final Exam    |
|---------|----------------|----------|---------------|
| nn      | days and times | location | date and time |
| Lnn     | days and times | location |               |

**Catalog description:**

This course presents the fundamentals of computer/user interfaces using windows frameworks and object-oriented programming concepts. The basic concepts of a user interface, including command-based, graphical, and multimedia interfaces, are covered in a manner independent of specific technologies. A modern window-based interface implementation is then introduced through the use of one or more current object-oriented programming languages and object interface libraries. (Consult the instructor for the language(s) and libraries to be used.) Three lecture hours and three hours of scheduled laboratory per week, plus programming work outside of class. Not open to students who have received credit for CSC 312A.

**Prerequisite: CSC 115 or CSC 202J.**

**Goals:**

The purpose of this course is to develop an understanding of the factors influencing the design of human-computer interfaces. The goals for this course are:

- CG01: to develop an appreciation of the interdisciplinary nature of human-computer interface design;
- CG02: to develop an understanding of the effect of hardware and software technologies on human-computer interfaces, from the past through the present and the near future;
- CG03: to explore a state-of-practice library (including documentation), specifically one designed to support window-based event-driven interface implementation.

**Objectives:**

Upon successful completion of the course, student will have:

- CO01: demonstrated knowledge of the disciplines which contribute to Human-Computer Interface (HCI) design and their roles in the analysis and design process;
- CO02: demonstrated the ability to analyze the requirements for an interface, determine the significant environmental factors, and produce viable documented design proposals;
- CO03: selected and utilized tools required to implement an interface design;
- CO04: presented and defended HCI design(s) in a group setting;
- CO05: critically evaluated implemented interfaces.

**Program Outcome vs. Course Objectives matrix**

| Program Objective<br>(condensed form)                                  | CO01 | CO02 | CO03 | CO04 | CO05 |
|--|------|------|------|------|------|
| <b>PO-A:</b> apply knowledge of computing and math                     | ✓    | ✓    | ✓    | ✓    | ✓    |
| <b>PO-B:</b> analyze a problem and define its computing requirements   | ✓    | ✓    | ✓    | ✓    | ✓    |
| <b>PO-C:</b> design, implement and evaluate applications               |      |      | ✓    | ✓    |      |
| <b>PO-D:</b> function effectively in teams to accomplish a common goal |      |      |      | ✓    |      |
| <b>PO-E:</b> professional, ethical, and social responsibilities        |      |      |      |      | ✓    |

| Program Objective<br>(condensed form)  | CO01 | CO02 | CO03 | CO04 | CO05 |
|--|------|------|------|------|------|
| <b>PO-F:</b> communicate effectively with a range of audiences   |      |      |      | ✓    | ✓    |
| <b>PO-G:</b> local and global impact of computing on people and society  |      |      |      | ✓    | ✓    |
| <b>PO-H:</b> need for continuing professional development  |      |      |      |      | ✓    |
| <b>PO-I:</b> use current techniques, skills, and tools   | ✓    | ✓    | ✓    | ✓    | ✓    |
| <b>PO-J:</b> apply theory and principles to model and design systems   |      | ✓    |      |      |      |
| <b>PO-K:</b> apply design and development principles in constructing software  |      |      |      |      |      |
| note - full statements of the Program Outcomes (program objectives) for the Computer Science Major can be found in the document <i>Computer Science Major Program Educational Objectives and Program Outcomes</i> on the Assessment page of the Computer Science Major (cs.salemstate.edu) |      |      |      |      |      |

### Topics:

- Human-computer interface design as an interdisciplinary practice **HC1 (1.5)**
  - contributing disciplines and their roles
- Human side of HCI: psychology / physiology **HC1 (9)**
  - cognition
  - perception
  - attention and memory constraints
  - learning in context
  - social and organizational aspects
- Computer side of HCI: technological capabilities and limitations **HC1 (1.5)**
  - input devices
  - output devices
  - software tools
- Designing user interfaces: paradigms and their principles and characteristics **HC2(3)** HC4(3),HC5(1),HC6(2) (nc)
  - command-line
  - menus
  - forms
  - graphical
  - multi-media
  - natural language
- Comparison of interfaces paradigms, their strengths and weaknesses **HC3(3)** HC5(2) (not core)
  - command-line (text-based) vs. graphical user interface (GUI)
- Tools: high-level interface libraries **HC2 (1.5)**
  - constructing general dialogues
  - constructing file dialogues
  - constructing find and replace dialogues
  - building applications with standard document interfaces
- Tools: low-level interface components **HC2 (1.5)**
  - scroll bars
  - buttons
  - lists
  - grouped controls
- Multi-user systems HC8 (2) (not core)
  - design considerations
  - asynchronous vs. synchronous communication effects
- Multimedia systems HC7 (1) (not core)

### Case studies and laboratory exercises:

There will be 4 to 6 programming assignments in which students will be asked to implement selected techniques. There will also be periodic written homework assignments.

Case studies presented in class and used for programming projects will be drawn from areas of current interest and significance; examples of potential case studies include:

- | detailed design of a general interface
- | modification of a Class Roster program to allow dialogue input
- | modification of a text-based query system program to allow the use of buttons and dialogue boxes to express the query and scroll-barred windows to display the results
- | modification of other selected assignments from CSC courses to make use of an enhanced graphical input or output
- | construction of curriculum flow sheets to specify a prerequisite structure and to evaluate a transcript and/or specific requested courses

Careful attention will be paid to implementation details.

**Grading:**

The course grade will be determined using the following approximate weights: laboratory reports - 40%; written homework - 10%; examinations (two one-hour exams and a final exam) - 50%.

**Course Objective / Assessment Mechanism matrix**

|      | Test / Quiz Questions | Homework Problems | Programming Projects | Lab Exercises | Group Projects |
|------|-----------------------|-------------------|----------------------|---------------|----------------|
| CO01 | ✓                     | ✓                 | ✓                    | ✓             | ✓              |
| CO02 | ✓                     | ✓                 | ✓                    | ✓             | ✓              |
| CO03 | ✓                     |                   | ✓                    | ✓             | ✓              |
| CO04 |                       |                   | ✓                    | ✓             | ✓              |
| CO05 | ✓                     | ✓                 | ✓                    | ✓             | ✓              |

**Bibliography:**

*References*

Baeker et. al., editors. **Human Computer Interaction, Toward the Year 2000**. Morgan Kauffman, 1996.  
 Carroll, John. **Human-Computer Interaction in the New Millenium**. Addison-Wesley, 2002.  
 Dix, Alan J.; Finlay, Janet E.; Abowd, Gregory D.; Beale, R. **Human-Computer Interaction. Third Edition**. Prentice-Hall, 2003.  
 Galitz, Wilbert. **The Essential Guide to User Interface Design. Third Edition**. Wiley, 2007.  
 Gentner, D.; Grudin, J. "Design Models for Computer Interfaces" Computer, June 1996.  
 Heim, Steven **The Resonant Interface**, Pearson Addison-Wesley, 2008.  
 .  
 Lidwell, William, Holden, Kritina, Butler, Jill **Universal Principles of Design**, Rocport, 2003.  
 Preece, Jenny, *et al.* **Interaction Design. Second Edition**. Wiley, 2007.  
 Raskin, Jef. **The Humane Interface**. Addison-Wesley, 2000.  
 Schneiderman, Ben. **Designing the User Interface: Strategies for Effective Human-Computer Interaction. Fifth Edition**. Addison-Wesley, 2009.  
 Sharp, Helen, Rogers, Yvonne **Interaction Design: Beyond Human-Computer Interaction**, Wiley, 2007  
 Thimbleby, Harold **Press On: Principles of Interaction Programming**, MIT Press, 2008.

**Academic Integrity Statement:**

“Salem State University assumes that all students come to the University with serious educational intent and expects them to be mature, responsible individuals who will exhibit high standards of honesty and personal conduct in their academic life. All forms of academic dishonesty are considered to be serious offences against the University community. The University will apply sanctions when student conduct interferes with the University primary responsibility of ensuring its educational objectives.” Consult the University catalog for further details on Academic Integrity Regulations and, in particular, the University definition of academic dishonesty.

The Academic Integrity Policy and Regulations can be found in the University Catalog and on the University website ([http://catalog.salemstate.edu/content.php?catoid=13&navoid=1295#Academic\\_Integrity](http://catalog.salemstate.edu/content.php?catoid=13&navoid=1295#Academic_Integrity)). The formal regulations are extensive and detailed - familiarize yourself with them if you have not previously done so. A concise summary of and direct quote from

the regulations: "Materials (written or otherwise) submitted to fulfill academic requirements must represent a student's own efforts". *Submission of other's work as one's own without proper attribution is in direct violation of the University's Policy* and will be dealt with according to the University's formal Procedures. *Copying without attribution is considered cheating in an academic environment - simply put, **do not do it!***

**University-Declared Critical Emergency Statement:**

In the event of a university-declared emergency, Salem State University reserves the right to alter this course plan. Students should refer to [www.salemstate.edu](http://www.salemstate.edu) for further information and updates. The course attendance policy stays in effect until there is a university-declared critical emergency.

In the event of an emergency, please refer to the alternative educational plans for this course, which will be distributed via standing class communication protocols. Students should review the plans and act accordingly. Any required material that may be necessary will have been previously distributed to students electronically or will be made available as needed via email and/or Internet access.

**Equal Access Statement:**

"Salem State University is committed to providing equal access to the educational experience for all students in compliance with Section 504 of The Rehabilitation Act and The Americans with Disabilities Act and to providing all reasonable academic accommodations, aids and adjustments. **Any student who has a documented disability requiring an accommodation, aid or adjustment should speak with the instructor immediately.** Students with Disabilities who have not previously done so should provide documentation to and schedule an appointment with the Office for Students with Disabilities and obtain appropriate services."

**Note:** This syllabus represents the intended structure of the course for the semester. If changes are necessary, students will be notified in writing and via email.