COURSE GUIDE

FOR

DCTE 720/820 HUMAN-COMPUTER INTERACTION

CLUSTER FORMAT
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Getting Started

Welcome to the HCI course! This document provides specific instructions on what you need to do to complete the core course and the project course. As you know, much of your work will be completed in a computer-based format. In this dynamic environment, you will study human-computer interaction by researching and completing assignments and by discussing issues with your professor and fellow students.

Getting organized and maintaining organization is important for successful completion of this course. Please read this document carefully and login regularly to check for special announcements.

Online Access to Course Materials and Activities:

The HCI online study area is your direct link to the course, the professor, and fellow students. A Web site was designed for the purpose of centralizing and managing course activities. All of the most essential course materials (except hardcopy articles selected by the professor) are contained in files or menus off of the HCI online study area. In addition, this is the site where the professor frequently posts announcements to the class. Consider this online study area to be the “classroom” where you go to learn and communicate about HCI.

The HCI online study area is best viewed with a graphical browser. The URL address is: http://scis.nova.edu/nova/hci/top.html

Information Requested Early!

Shortly after the first cluster meeting, you will be given access to the Forums Web-based asynchronous bulletin board system. This is what I establish as the “HCI Discussion Groups.” In there I will post a thread called “Student Bios.” When this thread is established, please post a short biography about yourself. In your “e-bio,” indicate your full name, what term this is for you, and anything of interest to your fellow students. This will help us get acquainted in between cluster meetings.
Instruction Methods:

During the term, the class will continue in a computer-based format, primarily completed through the use of computer-mediated communication tools available through Nova Southeastern University's online environment:

The HCI Web site -- an online study area that presents this course and provides students with access to electronic mail (directly to the professor) and access to electronic conferencing (Student Forums).

electronic student/electronic teacher (ESET) -- the Web-based online tool available for submitting assignments. Note: accessible only with SCIS login and password.

electronic conferencing (Student Forums) -- for student participation and discussion. Can be accessed through the HCI Web site. Note: accessible only with SCIS login and password.

Accessing the HCI Online Study Area:

There are activities that you should check regularly to stay current with the course.

• Visit the Learning Connections link. That will lead you to your course section, lecture notes and other things to empower your learning experience.

• Visit the Interactive Exchanges link. In here I post Announcements, and a link to Student Forums. Be sure to check the “Announcements for Students” link on a regular basis. I often post messages to the class weekly.

• Visit the HCI Web Exploration link. There are several HCI resources to help you with your research.

NOTE: Revisions to the interface and other additional items will probably occur to the HCI online study area during the term. Remember, this is a dynamic environment!

About Student Forums -- Class Participation
The Student Forums is a Web-based conferencing system designed to serve as a discussion environment in which students and the professor discuss HCI issues throughout the term. The Student Forums can be accessed through the course Web site or through the SCIS Web site. Once you access the bulletin board corresponding to your course, you will be given topical areas pertinent to HCI. The professor will be posting topics throughout the term.

There will be several threads or mini-conference themes relating to Human-Computer Interaction (HCI). Specific topics will be posted throughout the term by the professor. Each student is required to participate in the discussions throughout the term. Points will be given on the basis of effort and meaningful contribution to the discussions throughout the term. Several short responses are encouraged, but they should be responses that reflect thought and promote further interest in the topic, not just responses for the sake of meeting the participation requirement. Steady contributions over the term are expected of all students in DCTE 720.

You may be the first student to contribute to a theme! Don’t be shy. Special recognition will be given to students who really contribute to the conference activity -- those who contribute first to a theme and those who participate regularly.

Please DO NOT establish your own threads or themes. If there is a particular topic you would like to discuss as a theme, write Dr. Dringus an email. From there, the professor will post all conference threads or themes. Also, the professor is the gatekeeper of the forums. So, the professor reserves the right to delete any student postings that are considered inappropriate or irrelevant to the discussions. Scholarly discussions are expected for this class discussion activity.

The professor will post a couple of starter topics early in the term so that you can practice using the Student Forums conferencing system. The first formal discussion topic will be posted around the third week of the term. Note that Student Forums is an asynchronous system enabling students to participate AT ANY TIME in the discussions. Participation on a specific evening and at a specific time is not required by this professor. However, to keep the discussions lively and active, students should plan as part of the weekly activity, to check out and perhaps contribute to the on-going themes. The Student Forums works best when everyone participates throughout the term. This is an opportunity for students to get to know one another during the term!
DETAILS ON COURSE ASSIGNMENTS

ASSIGNMENTS:
These assignments require outside research and activity:

Assignment #1: Due on or before April 7, 2002
Select and review five (5) journal articles related to the theory and practice of usability or usability as a process. Only specific HCI journals and conference proceedings may be used to select appropriate articles. One file containing all five reviews is the deliverable. Details for completing this assignment are presented in this course guide.

Assignment #2: Due on or before June 4, 2002 (The Monday after the second cluster meeting).

HCI Journal Report -- Keep and present your own HCI journal -- containing weekly observations of the HCI issues that pertain to your work and the work of others. A written report containing the journal entries and a summary of literature integration is the deliverable. Be prepared to discuss selected journal entries in class at the second cluster meeting. Details for completing this assignment are presented in this course guide.

Assignment #3 -- Due on or before July 21, 2002

Usability evaluations -- Conduct and report a usability test using a minimum of three subjects. If the test is planned and executed effectively, the results of the usability evaluation can lead to valuable recommendations for improving the quality of the product under evaluation. You will prepare a detailed report that will contain a presentation and discussion of the entire usability evaluation process (from conceptualization to reporting results and making recommendations). This exercise will give you direct experience of assessing user interface design by performing systematic observation of test subjects. Instructions for completing this assignment are presented in this course guide.
INSTRUCTIONS FOR COMPLETING ASSIGNMENT #1:

Usability Article Reviews

Article Review Guidelines

Choose five articles that are related to the theory and practice of usability or articles that present methods or processes for usability evaluation. Theory articles are geared towards discussing the attributes and metrics of usability, the definitions of usability attributes and metrics, and how these attributes and metrics apply to the design of user interfaces. Theory articles can also discuss usability principles as they apply to the practice of design, e.g., principles of good web design, etc. The good articles will offer a discussion of theory and practice to further along an understanding about something related to usability.

New methods or processes for usability evaluation are a common theme in HCI-type publications. For example, an article on applying the “think aloud” method in usability evaluation is acceptable, as well as other methods such as heuristic evaluation, etc. The types of articles you need to select for the reviews can ultimately be used for Assignments #2 and #3, when you synthesize literature in the papers to support your discussions. So be smart as to what articles you select for this assignment.

Only high-level HCI and usability articles are acceptable for this assignment, so be sure that you choose your articles ONLY from one of these sources:

Communications of the ACM
ACM Interactions (the official publication of ACM SIGCHI)
ACM Transactions on Computer-Human Interaction
CHI Proceedings, years 2000 to present
Proceedings from the Usability Professional’s Association, years 2000 to present.
The International Journal of Human-Computer Interaction (Lawrence Erlbaum Associates)
Human Factors and Ergonomics Society’s The Magazine on Human Factors Applications:
   Ergonomics in Design
Interacting With Computers (Elsevier Science)

Many of these publications can be found directly through NSU’s Digital Library – ACM Digital Library Database and other databases.

Each article review should be no more than two pages in length (double-spaced). Each article review should contain the following:

1. A full citation of the article. Present this first.
2. State the problem presented in the article in your own words.
3. Summarize the article, identifying the major issues and conclusions.
4. Describe your reactions. State whether you agree or disagree with the author(s)’ findings and/or conclusions, and explain why.
5. Provide a list of references at the end of each article that are of interest to you and that you may want to read to gain better perspective on the ideas presented in the article.

**Format for the Usability Article Reviews**

1. Follow all standard procedures (title page, line spacing, margins, proper citation format, etc.) as established in the SCIS Dissertation Guide.
2. Provide a Reference List at end of each article. (Again, adhere to the SCIS Dissertation Guide).
3. Submit the assignment AS ONE FILE through ESET.

**INSTRUCTIONS FOR COMPLETING ASSIGNMENT #2:**
HCI Journal Report

Overall Task: Keep an HCI journal for four weeks that includes your weekly observations of the HCI issues that pertain to your work and the work of others you either service or work with. As an information technology professional, this is an opportunity for you to reflect and observe on how HCI issues permeate what we do and how others are affected by how technology is designed and used.

Some directions on this: Present a chronological log of dates that provides a clear narrative of your observations/experiences in recognizing HCI in the digital environment. Some observations may include, but are certainly not limited to:

- The problems and opportunities of advocating HCI principles or strategies to fellow co-workers;
- Decisions on the job that are HCI related;
- Episodes of information overload and cause and effect;
- Norms of behaviors and habits of email communications;
- Observations of library patrons using an online catalog system;
- Your own enlightened view of the design of any interface;
- Copyright and intellectual property matters you may be dealing with;
- How people respond to online or hardcopy documentation;
- Some interface design challenges of multimedia retrieval;
- Observations on people and their information seeking behaviors or tasks and what HCI considerations are involved;
- Observations on differences or similarities between textual and graphical information (e.g. what was the last icon that you correctly or incorrectly identified?);
- Your thoughts on perceived vs. actual use of online library services, campus library services, Web search engines, etc.);
- Your favorite Internet sites that speak to good design and usability;
- Other creative ideas you may have!!

The list of possibilities for journal entries is endless! You will need to reflect considerably on things you may not have considered important in the past. Please do not provide sketchy observations and/or thoughts. Write your journal entries comprehensively and succinctly and demonstrate you have thought the experience through! The concluding part of the four-week journal should be a three-page summary of your experience observing HCI things and integrate pertinent HCI literature to support your observations/experiences. The HCI Journal report should be about 15-20 pages, including the journal entries and summary section. Be prepared to discuss selected journal entries in class.
Format for the HCI Journal

1. Follow all standard procedures (title page, line spacing, margins, proper citation format, etc.) as established in the SCIS Dissertation Guide.

2. Provide an introduction section (1 page) about the general issues of HCI that will be addressed in the paper.

3. Begin presenting journal entries:

   Example:
   
   Journal Entry #1, Monday 10/4/99 or give a scale of dates: Monday 10/4/99-Friday 10/8/99

4. Give a theme title to the observation

   Example:
   “The Design of a Billing Application Interface”

5. Describe the observation in third person narrative. Cite literature as appropriate.

6. Continue in this style, providing journal entries over a four-week period.

7. Provide a summary section of roughly 3-4 pages. The summary section should pull together many HCI issues observed or considered over the four weeks. It should contain substantial integration of prominent and current HCI literature.


   The paper should be about 15-20 pages, including back matter, etc.

INSTRUCTIONS FOR COMPLETING ASSIGNMENT #3:
Required Reading: (1) Review required texts for background on usability
evaluation, (2) Review professor's notes on usability evaluation, and
(3) locate additional (outside) usability articles or sources.

The student will conduct a usability evaluation. The results of the usability test can lead to
valuable recommendations for improving the quality of the product under evaluation. This
exercise will also give the student first-hand experience in assessing user interface design
through systematic observation. Note: these instructions are a GENERAL guide to usability
evaluation. Your usability evaluation will have to expand this general method. Some of these
issues may or may not be applicable to your usability evaluation.

General Method
You will need a minimum of three subjects for this exercise. Choose a hardware platform and
software package that you can arrange for your subjects (one at a time if necessary) to work
through the major features of the software package you have chosen. You will prepare a list of
tasks that each subject will perform with a brief description of each task to be performed on the
system. You may (if appropriate) prepare a flowchart showing the order tasks are to be
performed and other important events and sequences. Your job is to give each subject written or
verbal directions on how to complete the task; observe the subject working through the task; and
record the sequence of events. Upon collecting data from all subjects involved, prepare a report
describing the test process and the results of the usability test.

GUIDELINES FOR CONDUCTING THE USABILITY EVALUATION
The following guidelines have been adapted from the list of references at the end of this
section. These guidelines are provided to give you some ideas for organizing your usability test.
Some guidelines will be applicable to your test; some will not. Conversely, you may have other
ideas not mentioned here that would appropriately fit your test goal.

As you plan, conduct, analyze, and report your usability test, follow this format as
appropriate:

Planning Stage
1. Identify the test goals.
2. Describe what test method(s) you will use to reach
test goals.
3. Identify test subjects. This process should give
attention to:
   * a. user experience level/skills/capabilities
   * b. education
   * c. attitudes/willingness
   * d. demographics (age, sex, language, etc.)
   * e. user satisfaction of the product

*Note: This information is normally generated through a questionnaire. You should develop
a paper questionnaire or a list of interview questions to help you collect this information from your subjects.

You may also need to determine the requirements of users in regard to:
   a. speed required of user
   b. skill required of user
   c. physical capability of user
   d. responsibility required of user
   e. ease of use considered for the user
   f. the user's potential for misuse or error

4. Create workable tasks that test the product design.
   FOR EXAMPLE (these are not inclusive):
   a. Copy a table from a spreadsheet to a word processor document.
   b. Define a new printer.
   c. Print a document.
   d. Change a filename.
   e. Change the name of an icon.
   f. Change desktop colors and mouse speed.
   g. Move a file from one subdirectory to another.

5. Order and prioritize the tasks.

6. Determine which performance and subjective measurements to take.

7. Create the scenario (test lab) needed to conduct the test. (The "test lab" can be your office, home, or wherever you can set up the hardware and software.)

Remember to establish the following:
   a. workstation arrangement
   b. comfort/space of the testing lab
   c. modifiability of the testing environment
   d. room details (lighting/heat/air/cleanliness/noise/distractions.

8. In regard to tasks, be sure to:
   a. Provide a general description of each task to be performed.
   b. Describe what steps are in each task.
   c. Distinguish interaction with other tasks.
   d. Identify if it is an individual or group task (as applicable).

Conducting the Test/Collecting Data

There are different strategies for structuring the test for your subjects. You can either have all subjects work together at the same time (if you have access to multiple workstations), test a pair of subjects at one time (if you have at least two workstations), or test one subject at a time.
Whichever option is workable for you, your main role will be to initially describe the test procedures to the subject and RECORD their actions. (By RECORD, this means either get a script file or you will need to write down their actions on paper.) It is recommended that you do not offer assistance to subjects during the test period.

1. Describe the procedures explained to the subject.

2. Record on paper the subject's actions during the usability test. Recording possibilities could include, but are not limited to:
   a. the subject's comments (This is known as the "Think Aloud" Method).
   b. time spent on single tasks and overall test.
   c. time of day and the date subject completed test.
   d. the number of errors the subject made.
   e. the number of successes the subject gained.
   f. how the user was able to recover from errors.
   g. how often the user could not recover from errors.
   h. did the user seek help through online help, or written documentation.
   i. the number of times the subject sought assistance from you.

Reporting the Data
Prepare a report that describes what you did and what you found. Include the entire process (planning stage through collecting data) and the results of the usability test. You should be able to highlight unique events that occurred on the basis of the subject's performance and your systematic observation. Identify the major variables associated with usability of the product you have chosen (e.g. discuss learning factors, performance factors, error recovery factors, effort to complete a task or set of tasks, user's attitude toward program, etc). Give recommendations for improving the user interface or the software package in general. Discuss your results in relation to concepts presented in the required texts and in class. Also, provide integrate other literature sources that support or contradict findings relative to your usability evaluation. The report should be about 20 pages.

Format for the Usability Evaluation

1. Follow all standard procedures (title page, line spacing, margins, proper citation format, etc.) as established in the SCIS Dissertation Guide.
2. Provide an introduction section to describe what software or product is being evaluated and the general scope of the report.
3. Follow the Instructions. Also, be sure to follow the Usability notes contained in the HCI Resources and Notes.
4. The body of the report should contain an examination of the “process” of usability evaluation. The author should reflect on the process and integrate literature throughout the entire report to provide support for the discussion.
5. Provide a Reference List.
6. If appropriate, provide Appendices – can include surveys, task list, forms to organize observation and think aloud, other information gathering forms.

Note: Assignment #3 REQUIRES extensive discussion of detail about PROCESS. Outcomes are secondary to demonstrating an understanding of process. Synthesize the literature to support your notions or decisions regarding PROCESS.

The paper should be about 20 pages, including back matter.

DCTE 820: PROJECT IN HUMAN-COMPUTER INTERACTION

Objective: This course requires the student to plan and execute a project that applies the concepts of human-computer interaction in an experimental or real world, practical environment.

PROJECT DELIVERABLES
Project proposal: due on or before May 3, 2002:

The proposal should contain a narrative discussion of the following elements:

1. Introduction
   - Problem Statement and Goal
   - Relevance
   - Barriers and Issues

   Includes a complete description of your topic. State the problem. Provide background on the problem and what issues are involved. Provide supporting evidence through the literature.

2. Review of Literature
   Start on the review of literature -- the synthesis of literature as a conceptual bridge to your topic.

3. Plan and Approach
   - Describe the type of project you will be performing (research, design, implementation, evaluation, etc.).

   Describe and outline the general strategy (or method) for executing the project.

   Provide a list of research questions that will be used to explore the topic in depth.

4. Expectations
   - Discuss why this topic is important to explore, and if appropriate, how the topic relates to your dissertation research. Describe what you expect to accomplish by completing the project.

5. Reference List
   - This proposal should be about eight pages and should be written in the future tense (what will be proposed), third person narrative. Follow all standard procedures (title page, line spacing, margins, proper citation format, etc.) as established in the SCIS Dissertation Guide. Try to follow the five-chapter model as close as possible for this project.

Project Final Report: due on or before July 28, 2002:

The project final report should contain all five chapters of the five-chapter model (Introduction, Literature Review, Methodology, Results, Conclusions). In addition, appendices should be included where appropriate. The final report should be 30-40 pages. Follow all standard procedures as established in the SCIS Dissertation Guide.

Topic:
Based on new information and knowledge gained from the 720 course, students will be able to isolate a particular topic of their own interest relating to HCI, investigate the topic through literature search, and produce a scholarly project. Below are some suggested areas that are appropriate for further investigation.

**Agent Technology**  
Interfaces for agent technology, social aspects of agent technology, usability.

**Analysis and Evaluation Techniques**  
Methods for analyzing and evaluating the effectiveness of designs and implemented systems.

**Application-Specific Designs**  
Interfaces for specific application areas, in which the domain places significant constraints on the design or implementation of the interface.

**Design Processes**  
Explorations of the design process, techniques for capturing designs, and methodologies for producing good designs.

**Development Tools and Methods**  
Toolkits and interactive systems for constructing interfaces.

**Group Work**  
Explorations of people using computers to work together, and systems for enhancing group work.

**HCI and the Web**  
Explorations of Web technologies, user considerations, design issues, standards.

**Interaction Technology and Techniques**  
New input/output devices and techniques, and exploration of existing devices and techniques.

**Interface Components and Designs**  
Exploration of interaction styles, metaphors, and graphic elements that support the interface.

**Legal and Standards Issues**  
Patent and copyright issues, proposed standards for user interaction, and evaluations of existing standards.

**Models of the user**  
Models of user learning and user performance, mental models of system behavior, and studies of how these models can be used to improve interfaces.

**Organizational Context**
Understanding how HCI design and implementation fits into the organizations that use and develop interfaces.

**Other Areas**
Additional topics of relevance to the HCI community. Prior approval from professor is required. Submit requests in writing (via email) to the professor. 
*It is strongly suggested that you select a topic that is related to your dissertation topic. In this way, you can leverage the research performed for this project into your dissertation research.*

**Project Type**
One of the following project types is acceptable for this course:

1. Exploratory discussion on a topic. An extensive examination through literature review of an HCI issue. Provide specific research questions that form the basis for the discussion. Make recommendations for potential dissertation research in the area.

2. Research: Apply the concepts of human-computer interaction in an experimental setting in order to validate or advance the knowledge in the field. Example: Design, perform, and report the results of an experiment to determine how user interfaces can support a variety of learning styles.

3. Design: Design a user interface for some specific application. Example: Design a user interface for a groupware application.

4. Implementation: Implement a new application or system and assess the results of the user interface.

5. Evaluation: Conduct another usability evaluation. Evaluate a single system or evaluate and compare two or more similar application products.

6. Other: Other project formats are acceptable but must be pre-approved by the professor. Examples: Report the current state-of-the-art of prototyping tools or outline a strategy for initiating participatory design activities in your company.

**Project Report Outline:**
Follow the procedures established in the SCIS Dissertation Guide!

Written in the past tense (what you did), third person narrative.

Title page: The title or your report, your name and username, the course number, and the date.

Table of contents
Chapter 1: Introduction. Includes a statement of the problem and a description of the significance of your project to the HCI field.

Chapter 2: Literature Review. A discussion of the current literature relating to your topic.
Note: in the proposal you will supply a brief start of the literature review. The final report must contain the complete literature review. You should include at least 20-30 references in your literature review in the final report. Preferably, these references should be from academic journals. Limit your use of magazine articles as they are often non-refereed sources. Online citations should be kept to a minimum, unless cites come from respected HCI sources. Scholarly texts on HCI are acceptable, too.

Chapter 3: Methodology. This chapter describes how you approached the project, including selection of subjects, procedures, experimental tasks, comparison/evaluation instruments, etc. Note that the methodology chapter is written in the future tense for the proposal, and in the past tense for the final report.

Chapter 4: Results. Provide narrative and tabular (if appropriate) results of your study.

Chapter 5: Conclusions. This chapter presents your conclusions and interpretations of your results, and relates your conclusions to the findings in the literature. In addition, this chapter presents your suggestions for areas which appear promising for further research.

Reference List: All sources used in researching and writing your report.

Back Matter: Appendices, large statistical tables, questionnaires, example screens, etc.

Tips to Providing Quality Submissions in this Course

It seems no matter how hard the professor tries to give explicit directions for completing assignments and project work, students often miss basic details in preparing their written work. Here I offer some “additional” tips to providing quality submissions in this course.

1. Remember that everything you submit to your professor should be of the highest quality work. You are to demonstrate scholarly knowledge of the subject area. Refrain from stating the obvious and generic things. Approach your work from a high-level of thinking – what are the underlying issues and how we can approach HCI differently.
Synthesizing the literature is very important in this course. Do not simply quote authors, instead paraphrase and cite important sources that describe the essential aspects of the issues. Compare and contrast what authors are saying about a particular issue.

2. Use third person narrative throughout your papers. Take a formal approach to presenting your discussion and arguments. Avoid “I, me” statements. If you have to refer to yourself, use “the author discovered……”

3. There should be ample literature citation in the body of the report and a correctly formatted Reference List at the end of the paper. Anything that is not of general knowledge to the reader should be cited in the body of the paper.

4. Use 12 pt type in all papers. Figures or tables can be reduced as needed. However, it is best to follow the SCIS Dissertation Guide for form and style.

5. Use current literature – 3 years to present will probably produce the most insightful information. Points will be reduced for extensive use of required reading and the use of sources that are not current. You must demonstrate that you have researched the topic beyond what the professor has already given you.

6. Limit the number of Web-based sources, UNLESS they are refereed-type HCI articles available on the Web. Only use high quality and reputable HCI Web-based sources.

7. You should have at least 10 sources for Assignments #2 and #3, but it is likely you will have 20-30 references for each assignment. Again, demonstrate that you have researched the topic through the literature.

8. Assignment #3 REQUIRES extensive discussion of detail about PROCESS. Outcomes are secondary to demonstrating an understanding of process. Synthesize the literature to support your notions or decisions regarding PROCESS.

9. Contact the professor if you have any questions!