User Interface Design

CSCI 3160 (CRN 12697)*

Fall 2012/2013

Meeting Time:	Tues. & Thurs. 10:05 – 11:25 a.m.
Meeting Room:	Life Sciences Centre room C236
Professor:	Jamie Blustein
	Office Hours: Tues. & Wed. 2:30–3:30 p.m. *and* by appointment
	Office: #223, Goldberg Computer Science Bldg.
	E-mail: ⟨jamie@cs.dal.ca⟩
	Telephone: +1 (902) 494-6104
Class website:	⟨URL:http://www.cs.dal.ca/~jamie/CS3160/⟩
Prerequisites†:	CSCI 2132 or INFX 1616
Co-requisite†:	CSCI 2140 or CSCI 2141
Ante-requisite:	CSCI 4163
Required Textbook: (*either one*)	*The Resonant Interface: HCI Foundations for Interaction Design* by Steven Heim. © 2008. Published by Addison Wesley Higher Education (ISBN 978 0 321 37596 4). *User Interface Design and Evaluation* by Debbie Stone *et al.* © 2005. Published by Elsevier, Inc. as Morgan Kaufmann (ISBN 978 0 120 88436 0).
Recommended Textbook: (*any* edition)	*The Non-Designer's Design Book* by Robin Williams. Published by Peachpit Press (3rd ed. (2008), ISBN 978 0 321 53404 0)

Assessment Components:		
	Project	33%
	Test (25 October)	15%
	Final exam	40%
	Class participation, Assignments, Homework, Quizzes	12%

Syllabus and Course Updates:	The schedule and procedures in this syllabus are subject to change in the event of extenuating circumstances. Updates to the syllabus or other material on the CD-ROM will be posted to the webpage at ⟨URL:http://web.cs.dal.ca/~jamie/course/CS/3160/Updates/⟩.

1 Class Content and Goals

'This class deals with concepts and techniques underlying the design of interactive systems. Both human factors and the technical methods of user interface design are covered. Students will learn how to apply various techniques through the design, creation, and testing of a prototype system.'

quoted from *Dalhousie University Calendar 2012/2013*

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*3 credit hours, undergraduate class, syllabus version 02 September 2012 (1c).

†According to *Dalhousie University Undergraduate Calendar 2012/2013*.

1.1 Teaching Perspective

As the professor my first goal in this class is to raise awareness of the importance of design that accounts for users' physical, behavioural and information processing characteristics and requirements. Experience has shown that failure to deal with such characteristics can lead to wasted functionality, user frustration, inefficient practices, discomfort and error-prone activity.

You (the student) will develop the following basic skills:

- abstract task analysis

- design specification

- user testing

- critical evaluation of results of user testing

- working in small groups to develop a draft of a user interface for specific users with specific needs

A secondary goal is to teach you how to develop interfaces for software and hardware applications in which user experience is a central issue. I will use a hands-on approach to introduce techniques and tools to support a an iterative user centred software lifecycle consisting of

1. requirements gathering
2. design
3. evaluation
4. prototyping
5. testing
6. refinement

1.2 Tentative Topic List

1. Introduction to HCI
   - what is HCI, why we need it
   - how it fits into software design

2. Introduction to usability engineering and project
   - Usability Engineering lifecycle models
   - Items of production

3. Models of usability

4. Basics properties of users
   - sensation, perception, cognition, and motor skills
   - memory, reasoning and information processing, expertise

5. Interaction styles
   - Menus,
   - Form fill-in,
   - Command line interfaces,
   - Direct manipulation,
   - Novel interfaces (e.g. haptic feedback)

6. Evaluation of user interfaces
   - Testing without users
     - Guidelines and heuristics
     - Scenarios and cognitive walkthroughs
   - Prototyping
     - Paper prototypes
     - Web prototypes
     - Code prototypes

7. Design methods
   - Formative evaluation
   - User and feature analysis
   - Task analysis
   - Prototyping

8. Potential Additional Topics
   - Design for Happiness (Pieter Desmet)
   - Activity Theory for HCI

Sample only — this is not the current syllabus

1.3 Unofficial Learning Outcomes

The Faculty's Curriculum and Teaching committee has produced a non-binding list of 'student learning outcomes' for this course. The list from ⟨URL:https://academics.cs.dal.ca/curriculum/manage/course/CSCI/3160⟩ as it appeared on 13 August 2012 is below.

- Describe the importance of user interface design and usability in the application development process.
- Select appropriate interaction styles input choices, and navigation types for different interfaces and information spaces.
- Identify the basic properties of users and devices that must be considered when designing and implementing interactive applications.
- Recognize the different models of usability.
- Develop a user interface prototype that considers the basic properties of users and devices.
- Evaluate user interfaces without users.

- Design a user interface in agreement with the standard user interface guidelines and best practices.
- Identify and contrast different user interface design methods.
- Justify the design decisions made for appropriate interface types.
- Apply a user interface design method to develop a user interface prototype.
- Contrast the role of low and high fidelity prototypes in user design and evaluation.
- Construct low and high fidelity prototypes.

2 Expectations

My **rôle of your professor** is not to teach as such but to *help you to learn*. You are responsible for your own learning. I will explain and motivate the material. Grades will be based on my assessment of the quality of your work. You must *demonstrate* that you understand *and* can apply the material to succeed in this course. I will give you assignments that will help you to practice and improve your skills. I will try to make the assignments interesting and challenging.

Our **time in the classroom** will be used for lectures, discussions, quizzes, and work in groups.

The typical **student should** spend at least three hours studying for every hour of time in the class meetings. Some of that time will be preparation for lectures, some will be for review, and some will be time spent on the project and assignments. Some weeks more time will be required than in other weeks, but to best use your time I recommend that you spend at least some time *on the day of* a class meeting reviewing your notes and the material that was presented.

I expect you to attend each class meeting, to be on-time, and to be prepared for virtually all of the class meetings. I expect you to participate meaningfully in all of the activities in the classroom. I remind you that part of your grade is based on your participation in the intellectual atmosphere of inquiry in the class (see §3.2.4 on page 9).

If you miss a class meeting, for any reason, you are responsible for the material covered, any assignments that were given, and any announcements that were made. I will try to make copies of lecture notes, etc. available to you on the CD-ROM you got at the start of the class, on my website, at the Killam library, or all three.

A **tentative list of topics** for us to study is in §1.2 on page 2. The list and order may change depending on what you (the students as a whole) have as background knowledge and what I feel is necessary for you to get the most out of the project.

Before I lecture about most topics I will assign **readings from the textbook or elsewhere** for you. You should consider that the readings listed in the schedule (§4, pp. 11*ff*) as assigned unless I inform you otherwise. *You will get the most benefit from the class if you complete the assigned reading and make notes before the class meets.* If you cannot complete the reading before the lecture and in-class discussion then you should do the reading carefully after the meeting has met to discuss the topic.

2.1 Prerequisites

At a minimum I expect students to be familiar with modern computer systems, have some experience writing computer software (preferably interactive programs with a graphical interface), basic problem-solving ability, fluency in written and spoken English to be expected of a successful student after two full years of university education in English.

Formal prerequisites for this class are one of CSCI 2132 (Software Development) or INFX 1616 (Applications of Computing) and the former CSCI 2140 (Data and Knowledge Fundamentals) or CSCI 2141 (Introduction to Database Systems). Of those classes, only CSCI 2140 can be taken concurrent with this class.

The FCS requires a minimum grade of C^- to satisfy a pre-requisite[*].

Students with experience working in groups might find the collaborative project part of the class easier. An important part of the course is an introduction to concepts in user-centred design and usability engineering. Students with experience, and knowledge of, the fundamentals of software engineering should find the introduction of usability engineering lifecycle models easier than students without formal exposure to those concepts. Many projects that students select for this class are fundamentally about structuring, using, and managing information and knowledge, so it can be to the advantage of prospective students to have a practical understanding of databases and related issues.

Therefore the following courses are **recommended but not required**:

- CSCI 2110 (Computer Science III)

- CSCI 2132 (Software Development)

- CSCI 3130 (Intro to Software Engineering)

- INFX 2640 (Use and Design of Databases)

2.2 Help

There are many resources to help you in this class: me (your professor), the materials provided by your professor, the textbooks, the lab, certain websites, and the other students. In the end however the responsibility for learning is yours. Details of the various assignments will be discussed in meetings. All students are expected to do their own work!

2.2.1 Office Hours

The office hours listed on the front of this syllabus are times when I will be in or near my office. You may drop-in to discuss anything related to the class during those times. If you want to meet with me at some other times then it is best for you to make appointment, but you can also come to my office in case I have time available right then. You can make appointments in person (e.g., after class meetings or during my office hours), by e-mail or by telephone.

2.2.2 Materials in the Killam Library

Federal law and university policy forbid me from *directly* providing you with photocopies or digital copies of materials from textbooks. Several books (including the textbook by Stone et al.) are on reserve in the Killam Library. All of those materials should be listed by your instructor's surname viz. ʙʟᴜꜱᴛᴇɪɴ but not necessarily by course name or number.

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[*]*Dalhousie University Undergraduate Calendar 2012/2013* p. 266

Sample only — this is not the current syllabus

2.2.3 Writing Centre

The Writing Centre has asked me to pass along the following information in the syllabus.

Writing expectations at university are higher than you will have experienced at high school (or if you are entering a master's or PhD program, the expectations are higher than at lower levels). The Writing Centre is a Student Service academic unit that supports your writing development. Make an appointment to discuss your writing. Learning more about the writing process and discipline-specific practices and conventions will allow you to adapt more easily to your field of study.

Dalhousie Writing Centre Main Location   (Learning Commons, Main Floor)

Monday & Tuesday	10:00 – 19:00
Wednesday & Thursday	10:00 – 21:00
Friday	10:00 – 16:00
Sunday	12:00 – 17:00

At Sexton   (Room A108)

Wednesday	18:00 – 21:00
Friday	09:00 – 12:00

At Black Student Advising   (4th Floor SUB)

Monday	12:00 – 14:00

Weldon Law Library   (Basement — Room 114 F)

Wednesday	18:00 – 20:00

Book an appointment: E-mail writingcentre@dal.ca or call 494-1963 or go to the Dalhousie homepage, log on to MyDal, and select the "Learning Resources" tab. You'll see the "Writing Centre" BOOK AN APPOINTMENT button.

3 Policies and Rules

Students are subject to all applicable University and Faculty policies. By your enrollment in this class beyond the first day you are deemed to be fully aware of all such obligations and responsibilities so most of them will not be repeated here.

3.1 General

Your attention is particularly drawn to some of the policies, rules, and regulations that apply to all undergraduate classes.

3.1.1 Grading Scale

I do not assign grades, rather I assess the quality of your work to determine how well you demonstrate your understanding of the topics of the class. The definitions of grade levels are in Dalhousie University's current Undergraduate Calendar. I am bound by Faculty of Computer Science regulations that do not allow more than 20% of the students to get $\mathcal{A}$-level grades other than in the most exceptional circumstances.

Regulations: FCS Council Meetings of 2004-03-23[*] and 2005-05-24.

3.1.2 Accommodations to Ensure Accessibility

Any student wishing to discuss an accommodation on the basis of permanent or temporary disability is asked to register with the Advising & Access Services Centre (AASC) in the Mark A. Hill Accessibility Centre off the patio in front of the Killam library, by telephone at 494-2836, by e-mail at staccess@dal.ca, or by fax at 494-2042. *Your grade should reflect how much you can demonstrate you know and can apply about the topics of this class.* If you have registered with the AASC then I will be guided by their advice in deciding how you are asked to demonstrate that knowledge.

The AASC asked me to pass on the following statement to my students.

> Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic under the Nova Scotia Human Rights Act. Students who require academic accommodation for either classroom participation or the writing of tests and exams should make their request to the Advising and Access Services Center (AASC) prior to or at the outset of the regular academic year. Please visit www.dal.ca/access for more information and to obtain the Request for Accommodation – Form A.
>
> A note taker may be required as part of a student's accommodation. There is an honorarium of $75/course/term (with some exceptions). If you are interested, please contact AASC at 494-2836 for more information.
>
> Please note that your classroom may contain specialized accessible furniture and equipment. It is important that these items remain in the classroom, untouched, so that students who require their usage will be able to participate in the class.

3.1.3 Plagiarism

Plagiarism will not be tolerated in any part of any work presented or submitted to the professor for any reason. You must do your own work and provide proper credit when quoting or paraphrasing the work of others. This policy applies equally to text, images, program code and algorithms. This policy applies to everything that you present or submit (in class meetings, in assignments, etc.) as part of this class. This policy applies to the whole of everything that you present or submit and every part of everything that you present or submit.

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[*]'2004-03-23' is the ISO format for the date 23 March 2004.

You may use any standard style guide you wish so long as you use it consistently. The reference desk at the Killam library or your professor can offer suggestions for style guides. Further details are in the §3.1.4 (immediately below).

3.1.4 Academic Integrity[*]

At Dalhousie University, we respect the values of academic integrity: honesty, trust, fairness, responsibility and respect. As a Dalhousie student and a member of the academic community, you are expected to abide by these values and the policies which enforce them. What is academic integrity?

Academic integrity means ensuring that any work you submit is your own and that you have given appropriate acknowledgment to any sources that you consulted. 'Dalhousie University defines plagiarism as the submission or presentation of the work of another as if it were one's own. Plagiarism is considered a serious academic offence which may lead to the assignment of a failing grade, suspension or expulsion from the University.' (from Undergraduate Calendar (2010/2011) section on Intellectual Honesty, p. 22).

Some examples of plagiarism are:

- failure to attribute authorship when using a broad spectrum of sources such as written or oral work, computer codes/programs, artistic or architectural works, scientific projects, performances, web page designs, graphical representations, diagrams, videos, and images;

- downloading all or part of the work of another from the Internet and submitting as one's own

- the submission of an assignment or other work prepared by any person other than the individual claiming to be the author

- submitting work that has been completed through collaboration or previously submitted for another assignment without permission from your instructor

How is plagiarism detected?   Professors and TAs are highly skilled at recognizing discrepancies between writing styles, inappropriate citations, and obvious word-for-word copying. In addition, the Senate has affirmed the right of any instructor to require that student papers be submitted in both written and digital format, and to submit any paper to an originality check such as that performed by Turnitin.com for essay papers, and MOSS for software code. Copies of student essay papers checked by this process will be retained by Turnitin.com.

What happens if I am accused of plagiarism?   Instructors are required to forward any suspected cases of plagiarism to the Academic Integrity Officer (AIO) for the Faculty. You will be informed of the allegation by the AIO and a meeting will be convened. You may contact the Dalhousie Student Advocacy Service who will be able to assist you in preparing a defence. Until the case is resolved, your final grade will be 'PND'. If you are judged to have committed an offence, penalties may include a loss of credit, '$\mathcal{F}$' in a class, suspension or expulsion from the University, or even the revocation of a degree (for more information see Dalhousie's Academic Integrity website).

PND status came into effect 2009-01-21

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[*]The section is adapted from the original version which is from the Faculty Resources section of Dalhousie University's Academic Integrity website (⟨URL:http://academicintegrity.dal.ca/Faculty%20Resources/index.php⟩) entitled *Academic Integrity Statement for Syllabus*. The original is dated 16 July 2008. It was copied on 25 September 2008.

3.1.4 Academic Integrity *(cont.)*

How can I avoid plagiarism?

- Give appropriate credit to the sources used in all of your assignments

  – Use RefWorks to keep track of your research and edit and format bibliographies in the citation style required by the instructor — ⟨URL:http://www.library.dal.ca/How/RefWorks⟩

- If you are unsure about anything, contact your instructor or TA

- Prepare your assignments completely independently

- Make sure you understand Dalhousie's policies on academic integrity

Specifics for CSCI 3160: You must do your own work and provide proper credit when quoting or paraphrasing the work of others. This policy applies equally to text, images, program code and algorithms. You may use any standard style guide you wish so long as you use it consistently.

When citing webpages you must include the following details:

1. the address of the webpage,

2. the author of the webpage or a note that it is anonymous,

3. the date that the page was last updated or, if that is not available, the date that you read the page and a note to that effect.

Use of images (e.g. logos and icons) by someone else is essentially the same as quoting text. You must provide full citation information for any image that is not your own, even if the image is 'royalty free', you purchased rights to use it, or it includes the trademark symbol '$^{\text{TM}}$' or registered trademark symbol '®'.

 If you alter an image by someone else (for example by cropping or blurring it) or you combine two or more images to make a new image then you must identify the source of the original images (just as though you had used them without alteration) and note that you have modified, combined, or modified and combined the images.

☛ **In all circumstances** it is the student's responsibility to ensure that full credit is given and that it is clear whom is being credited for what.

3.1.5   Where can I turn for help?

Academic Integrity website — ⟨URL:http://academicintegrity.dal.ca⟩
     Links to policies, definitions, online tutorials, tips on citing and paraphrasing

Writing Centre — ⟨URL:http://writingcentre.dal.ca⟩
     Proofreading, writing styles, citations

Dalhousie Libraries — ⟨URL:http://www.library.dal.ca/How/Classes⟩
     Workshops, online tutorials, citation guides, Assignment Calculator, RefWorks

Dalhousie Regulations — ⟨URL:http://ug.cal.dal.ca/UREG.htm#12⟩
                 — ⟨URL:http://ug.cal.dal.ca/UREG.htm#13A⟩
     Definitions of 'intellectual honesty' and 'academic dishonesty', respectively

3.2 Regulations specific to this class

3.2.1 Late Policy

Since my comments on your work should influence the next stage of your project it is especially important that I receive your assignments on time.

Deadlines are at the beginning of class on Tuesdays and Thursdays, and noon otherwise. Work which is due at the start of the class meeting period but was not submitted to me in-class by that time will be late. *Even if your work is late* you should attend that day's class meeting.

Late work will be penalized by one grade level[*] per day (or part thereof) for the first day, and two grade levels per day after that. Saturday and Sunday will count as one day for this policy. You may not receive credit for work that is more than three calendar days late.

3.2.2 Assignments and Homework

Multi-page homework submissions must be neatly stapled (or otherwise bound) and your name must appear on the top sheet. Homeworks that are not stapled and documented will not receive full marks. **When sending documents by e-mail** please use either Adobe's portable document format (PDF) or plain text.

3.2.3 Quizzes, Tests, and Exams

The project guide includes a calendar of milestones for the class, including dates of tests. Exams will be scheduled by the Faculty and University. Quizzes are unlikely to be announced in advance. The dates for the test or tests are shown on the first page of this syllabus.

There will be no make-ups for quizzes. The quizzes are intended mostly to give you and me and indication of how well you understand material recently covered. If there are three or more quizzes then your lowest quiz score will not be used in the computation of your grade.

No make-up tests will be given without my permission. You will not get my permission without either prior notice of absence, a detailed letter from your physician, or evidence of a serious family crisis that required your attention. Make-up exams and tests may be administered in an essay form.

Unless specifically noted the following conditions will apply to all of your tests and the examination:

1. Your answers will be graded for accuracy, clarity, and completeness. It follows that rambling or excessively lengthy answers cannot earn full marks.

2. Answers which do not clearly refer to specific principles will not earn full marks.

3.2.4 Participation[†]

Your participation will be assessed on your contributions to discussion during class meetings, i.e., your readiness and eagerness to engage actively in discussion, your display of familiarity with the class materials, *and* willingness to ask intelligent and helpful questions. Participation is assessed more by contribution to the intellectual atmosphere of inquiry than by the number of questions, answers or comments.

Uncollegial behaviour will reduce your grade.

Pre-test Review One component of your participation will be based on the quality of the written questions and answers you submit as homework at the start of the class meeting preceding a test or exam. To help you prepare for tests, each student should submit two or three questions with answers that could appear on the forthcoming test. The class as a whole will take up some of the questions to help review the material prior to being tested on it.

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[*]One 'grade level' is the difference between an $\mathcal{A}^+$ (A-plus) and an $\mathcal{A}^\natural$ (plain A).

[†]The description of criteria for your participation grade is based on text used by A.-B. Graff of Nipissing U.

The schedule and procedures in this syllabus are subject to change in the event of extenuating circumstances.

3.2.4 Participation *(cont.)*

Assessment Scale   Please be aware of the following scale:

$\mathcal{A}$-level	student always has something interesting to say or work through with the help of the other students and professor; needs little or no prodding to participate.
$\mathcal{B}$-level	student more often than not productively participates in discussion generated by others.
$\mathcal{C}$-level	student occasionally participates in discussion, usually with some prodding; does not always demonstrate a grounding in the material, perhaps the student has not read all of the assigned material.
$\mathcal{D}$ or $\mathcal{F}$	student does not participate in class discussion, for whatever reason.

Semester Calendar

Week # ⇒	0	1	2	3	4	5	6	7	8	9	10	11	12	X	⇓ Day
Su		9	16	23	30	7	14	21	28	4	11	18	25	2	Su
M		10	17	24	1	8	15	22	29	5	12	19	26	3	M
Tu		**11**	**18**	**25**	**2**	**9**	**16**	**23**	**30**	**6**	**13**	**20**	**27**	**4**	**Tu**
W		12	19	26	3	10	17	24	31	7	14	21	28		W
Th	**6**	**13**	**20**	**27**	**4**	**11**	**18**	**25**	**1**	**8**	**15**	**22**	**29**		**Th**
F	7	14	21	28	5	12	19	26	2	9	16	23	30		F
Sa	8	15	22	29	6	13	20	27	3	10	17	24		1	Sa
Day ⇑		September				October				November				Dec.	⇐ *Month*

Dalhousie will be closed on 08 October.
There will be no classes at Dalhousie on 12 & 13 November.
Dr. Blustein will be away on 17, 18, 26 September, and 05 October.
The Registrar's Office will schedule the exam for sometime between 06 and 17 December.
Deadlines are at the beginning of class on Tuesdays and Thursdays, and noon otherwise.

4   Tentative Lecture Schedule

15 August 2012 (1a)

This schedule is subject to change to meet the learning needs of the students. In general, we will follow this order although some of the usability engineering (UE) implementation lectures may move to earlier dates. Those lectures should occur before the project phases to which they are most relevant.

The following notation is used

Books

Heim	refers to the textbook by Steven Heim
Stone et al.	refers to the textbook by Debbie Stone and others
Williams	refers to the textbook by Robin Williams

Materials

$\odot : X \rightarrow Y$ refers to files on the CD-ROM.

To navigate to the appropriate file begin with the *Main Menu*, then go to the *Topics*, then go to the named topic ('X' in the example), then go the material or lecture named ('Y' in the example). *Note* that although much of the material on the CD-ROM are simple PDF files, some of the materials are lists of resources, and some may require access to the Internet. The icons in the menu indicate the file type.

Week 0[*]   06 Sept

Readings[†]

either $\begin{cases} \textit{Heim}: \text{Chapter 1} \\ \textit{Stone et al.}: \text{Chapter 1} \end{cases}$

Lecture slides and major topics

$\odot$: Introduction $\rightarrow$ Human Factors Basics

- Overview of human-computer interaction (human factors)
- Concept of usability

Assignment

Read project guide and syllabus

Week 1   11 & 13 Sept

Readings

either $\begin{cases} \textit{Heim}: \text{Chapters 3 and 4} \\ \textit{Stone et al.}: \text{Chapters 3, 4, 6, 7 (esp. §7.4)} \end{cases}$

Lecture slides and major topics

1. video demonstrations of user interface projects from KMDI at UofT

2. $\odot$: Usability Engineering $\rightarrow$ Early Analysis Activities
   - Needs analysis
   - User analysis
   - Risk analysis
   - Why no one should design for themselves

3. $\odot$: Introduction $\rightarrow$ Usability (by Andrew Dillon)
   - Usability and why it is important
   - Process-Outcome-Affect model

Assignment

Homework #1 (*Lewis & Reiman*'s exercise 0.1)

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[*]The dates corresponding to week numbers are in the project guide.

[†]Students will get the most out of the lecture/discussions if they prepare by reading either Stone et al.'s *User Interface Design and Evaluation* or Heim's *The Resonant Interface before* the class meets.

The schedule and procedures in this syllabus are subject to change in the event of extenuating circumstances.

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| Week 2 | 18 & 20 Sept |

Readings

1. either $\begin{cases} \textit{Heim}: \text{§2.1, §2.2} \\ \textit{Stone et al.}: \text{Ch. 5 (esp. §5.3), Ch. 9 (esp. §9.3), Ch. 10} \end{cases}$

2. *Some of Don Norman's User-Centred Terminology* (attached to P.O.E.T. lecture slide handout)

Lecture slides and major topics

1. $\odot$: Introduction → User Centered Design *(P.O.E.T.)*
   - User-Centred Design

Assignment
   Homework #2 (*Lewis & Reiman*'s exercise 0.1 using UCD terms)

Reinforcement
   Quiz

| Week 3 | 25 & 27 Sept |

Readings

1. HTA handout*

2. Brad Myers's 'Challenges of HCI design and implementation'
   in *interactions* v.I n.1 pp.73–83 (esp. sidebar)
   ⟨URL:http://doi.acm.org/10.1145/174800.174808⟩

Lecture slides and major topics

1. $\odot$: Usability Engineering → UE Lifecycle Models
   - usability engineering (UE)
   - UE lifecycle models
   - Principles of UI design

2. $\odot$: Usability Engineering → Early Analysis Activities
   - Task analysis
   - Participatory design
   - The design team & centrality
   - Types of task analysis

Assignments
   In-class cognitive task analysis group exercise
   Group exercise: Apply prior 'use scenario' for informal assessment of a product found online

Project Phase User & Needs Analyses **due** this week

Assignment Group exercise: Create 'use scenario' for a product found online

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*The HTA handout is in the Killam library.

| **Week 4** | 02 & 04 Oct |

Readings

1. either $\begin{cases} \textit{Heim}: \S11.1–11.4, \S6.5.4 \\ \textit{Stone et al.}: \text{Ch.4 } \S1.3, \text{ Ch.5 } \S2 \end{cases}$

Lecture slides and major topics

$\odot$: Psychology Basics → Learning & Information Processing Part I

- Basic psychological understanding of human cognition
- Learning
- Information Processing
- Recall, Recognition
- Expertise, Memory, Representation

| **Week 5** | 09 & 11 Oct |

Readings

either *Heim* or *Stone et al.*

$\begin{cases} \textit{Heim}: \\ \bullet \text{ Chapter 6 and Appendix B (for standards and guidelines)} \\ \bullet \S2.3 \text{ (Interface Styles)} \\ \bullet \text{ Ch. 5 (Design)} \\ \quad - \text{ We'll revisit } \S5.4 \text{ (about evaluation) later, so you can skim it for now} \\ \quad - \text{ Less important are Chapters 6, 10–14} \\ \text{In } \textit{Stone et al.}: \\ \quad \textbf{Design guidance } \text{Chapters 9, 10, 14, 15} \\ \quad \textbf{Interface styles } \text{Chapters 11, 13, 14, 16, 17, app. to Ch. 19} \\ \qquad \textbf{less important } \text{Chapers 12, 15, 18, 19 (read at least intros)} \end{cases}$

Lecture slides and major topics

1. $\odot$: Introduction → Standard & Guidelines (part I)
   - Standards, guidelines, principles, and theories
   - Types of standards and guidelines
   - Shneiderman's 8 Golden Rules
   - Overview of interaction styles
2. $\odot$: Usability Engineering → Design Documents
   - The design process
   - Concrete and conceptual design
   - Operators and actions

Project Phase Task Analysis **due** this week

Assignment Guidelines group assignment

| Week 6 | 16 & 18 Oct |

Readings

(required)

(a) Walter Maner's *Formative Usability Evaluation*

(b) either $\begin{cases} \textit{Heim:} \\ \quad \text{Ch. 6 (esp. §6.6 – §6.10),} \\ \quad \text{Ch. 9,} \\ \quad \text{Scenario 10.2} \\ \textit{Stone et al.:} \\ \quad \text{Ch. } 5 \text{ (esp. §5.2),} \\ \quad \text{Ch. } 9 \text{ (esp. §9.3),} \\ \quad \text{Ch. 13 (esp. §13.2 – §13.5),} \\ \quad \text{Ch. 14} \end{cases}$

(optional) *Williams*: Chapter 1 and Chapters 2–6

Lecture slides and major topics

1. $\odot$: Psychology Basics → Gestalt & Design

   - Principles of human perception
   - Principles of visual design
   - Grid method
   - Colour

2. $\odot$: S/W Development → Testing

   - Summative and Formative testing
   - Discount (non-user) testing methods
     - expert review (especially with heuristics)
     - GOMS
     - cognitive walkthrough
   - Testing with users
     - measures
     - scripts and scenarios
     - types of errors and what they indicate about users' mental models
     - data collection protocols

Project Phase Design Document **due** this week

| Week 7 | 23 & 25 Oct |

Lecture slides and major topics

- catch-up

- review

Test

| **Week 8** | 30 Oct & 01 Nov |

Readings

either *Heim* or *Stone et al.*

Heim:

- §5.3 – end of Ch. 5 (pp. 168–192)

Stone et al.:

- §6.6 (pp. 114–122)
- Case studies
  - Ch. 15 from §15.4.3 (pp. 286–294)
  - §19.5.1 (pp. 398–399)

Lecture slides and major topics

1. $\odot$: Usability Engineering → Prototyping
   - Lecture slides and discussion
   - Nielsen Norman Group Video: Paper Prototyping: A How-To Training Video [record at ⟨URL:http://www.worldcat.org/oclc/53887908⟩]
2. $\odot$: UI Styles → Overview
   - Overview of user interface styles

Project Phases   1. Testing Strategy **due**   2. Private Demonstrations to the professor **begin** this week

| **Week 9** | 06 & 08 Nov |

Readings

1. either

Heim:
Design guidance Chs. 5–7,
Interface styles Chs. 2, 10

Stone et al.:
Design guidance Chs. 9, 10, 14, 15
Interface styles
- Chs. 11, 13, 14, 16, 17
- Ch.19's appendices
- less important: intro and summary of Chs. 12, 15, 18, 19

2. $\odot$: UI Styles → Physical Principles

Lecture slides and major topics

1. $\odot$: UI Styles → Standard & Guidelines (part II)
   - Explanatory models and theories
   - Grammars
   - Shneiderman's O-A-I model
2. Certain Fundamental Physical Principles in HCI

Project Phase Due Private Demonstration to Professor will continue *if* necessary

Week 10	~~13~~ & 15 Nov

Lecture slides and major topics

- continued from previous week
- review

Week 11	20 & 27 Nov

Readings   To be announced / distributed

Lecture slides and major topics

$\odot$: Psychology Basics $\rightarrow$ Learning & Information Processing Part II

- Basic psychological understanding of human cognition
- Reasoning and the rôle of representation
- Information Processing

Project Phases

1. Analysis of Testing Data **due** this week
2. Demonstration of 'final' version to professor and the other students

Week 12	27 & 29 Nov

Readings   To be announced / distributed

Lecture slides and major topics   To be announced

Week X	04 Dec

Lecture slides and major topics

1. catch-up
2. pre-exam review

Project Phases Due

1. Final portfolio
2. Fairness evaluation

Optional
    Anonymous Project Assessment due 12 December

Optional
    Anonymous Project Assessment due 12 December

The schedule and procedures in this syllabus are subject to change in the event of extenuating circumstances.

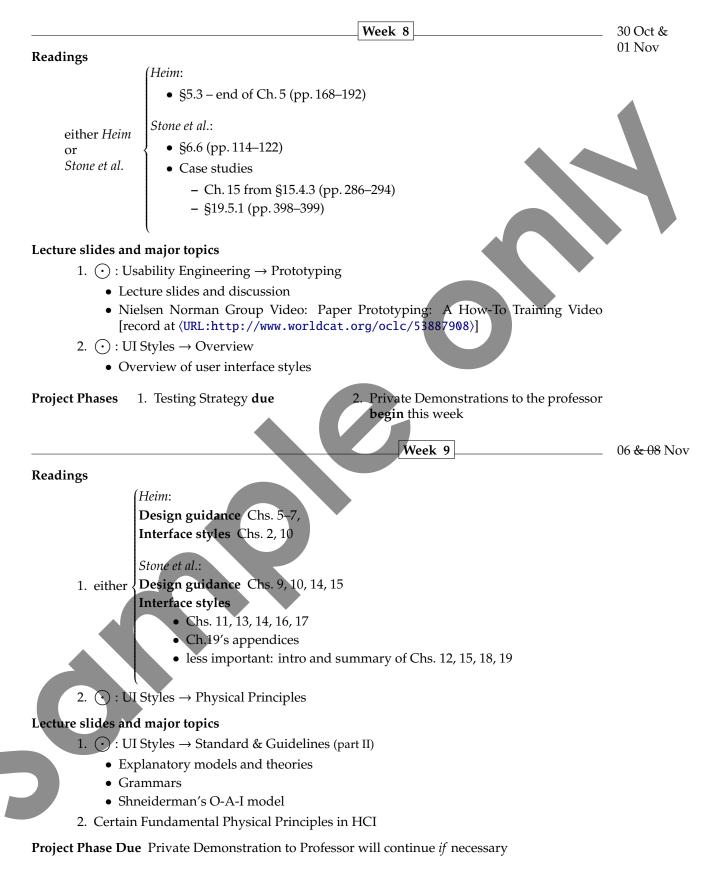Page 16 of 17   Version: 02 September 2012 (1c)
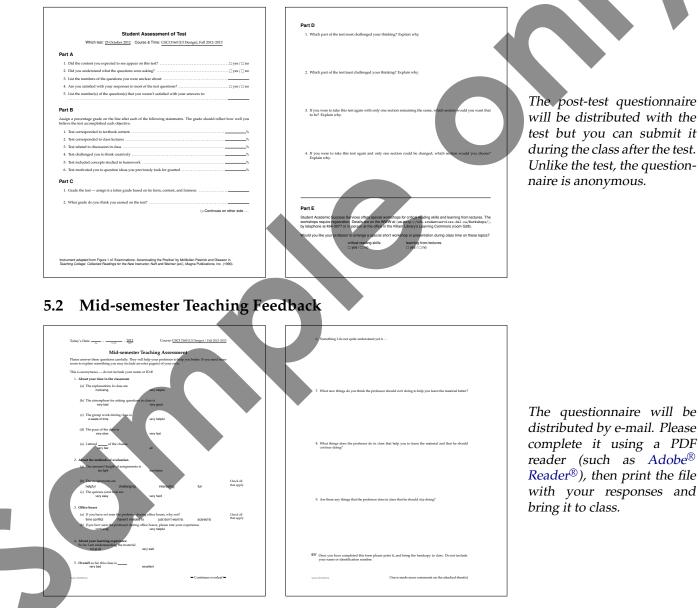
5　Anonymous Feedback to Your Professor

To help your professor to help you with your learning I will occasionally ask you for feedback on my teaching and the course. The views you share with me during the course can help me to make adjustments to suit you (the current students).

Thumbnail images of the two questionnaires I plan to use are below. PDF versions of the questionnaires are on your CD.

Please answer the questions honestly and constructively. Feel free to be candid since your responses are anonymous.

5.1　Student Assessment of Test

The post-test questionnaire will be distributed with the test but you can submit it during the class after the test. Unlike the test, the questionnaire is anonymous.

5.2　Mid-semester Teaching Feedback

The questionnaire will be distributed by e-mail. Please complete it using a PDF reader (such as Adobe® Reader®), then print the file with your responses and bring it to class.

The schedule and procedures in this syllabus are subject to change in the event of extenuating circumstances.

Page 17 of 17　　　　　　　　　　　　　　　　　　Version: 02 September 2012 (1c)

Usability Engineering Project

CSCI 3160   Sample Semester

2013-12-23 (1a)[*]

1 Overview

1.1 Description

For this project you will be part of a team of students that will design and implement a prototype of the user interface for a wide-ranging computer application. You must design a software interface. You may also design hardware interfaces.

In previous years, students have built systems for reading journal articles from computer screens, recipe management systems, and tools for keeping track of music collections. Your team may choose your own project (in consultation with me, your professor) *or* you may take my suggestion of a bibliography/citation management tool.

The project will consist of a set of phases. Each phase is important. Most phases will require you to submit an assignment, and will be graded separately.

All work you submit for grading must have a professional, finished appearance. When you need to submit rough drafts and handwritten records[†] they should be neatly organized.

1.2 Phases of Project and Schedule

In a real-world project the order of phases would likely not be so rigid, but because this is an educational exercise we are subject to different constraints than in the real-world. Below are the official due dates.

Milestone	Deadline	Weighting[‡]
User and Needs Analyses	Week 3	8%
Task Analysis	Week 5	20%
Design Document	Week 7	20%
complete prototype		
Testing Strategy	Week 8	17%
begin testing & data collection[§]		
Demo. to professor and TA	Week 9	5%
Analysis of testing	Week 12	17%
revise prototype		
Demo. of 'final' version to class	Week 12	7%
Final Portfolio	Week 13	3%
Group Leader Reports		3%
Fairness Evaluation	Week X	−50%
Project Assessment	Week X + 1	*optional*
Maximum *overall* bonus for appropriate innovation		+25%
Bonus is available for innovation that is appropriate to users and their needs/tasks		

Additional Notes

1. Deadlines are at the beginning of class (5:35 pm Tuesdays and Thursdays, and 11:05 am on Wednesdays) on the days when the class meets, and noon on the other days. Late work will be penalized as detailed in the syllabus.

2. The calendar (on page 20) shows the above dates.

3. The Registrar's Office will schedule the exam.

1.3 Project Homepage

Any updates to, resources for, and announcements about the project will be available from the project homepage on the WWW at ⟨URL:http://www.cs.dal.ca/~jamie/course/CS/3160/Project/⟩. Be sure to check it frequently. It includes a copy of this project description.

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[*]This project document is a revision of the January 1999 version of the Bowling Green State University Computer Science (BGSU CS) 324 course project description, which was written by J. Blustein. The BGSU CS document was based on earlier work provided by Laura Leventhal. For some details about the BGSU CS course see *Julie Barnes and Laura Leventhal; Turning the tables: introducing software engineering concepts in a user interface design course; In Proceedings of the 32nd SIGCSE Technical Symposium on Computer Science Education, (pp. 214 – 218), 2001; DOI:10.1145/364447.364587.*

[†]You will need to submit handwritten notes, etc. as part of your analysis of testing and final portfolio.

[‡]The negative weight indicates the maximum deduction; See also the grading scale in Appendix A (on page 19).

[§]You must not collect data from users without prior approval from the Ethics Authority (see p. 14).

2 Groups

> *'If you want to go fast, go alone. If you want to go far, go together.'*
> — proverb quoted by Prof. Susan Holmes

Products with significant user interface components should be developed in groups. Although many of you are not experts in UI design or the problem domain, you will benefit from group work. Being able to work in a diverse team will make you more valuable to potential employers.

2.1 Rules for Groups and Group Dynamics

1. Each group member is expected to make an equal contribution to the project. All group members will receive the same grades for the phases of the project except in the most exceptional circumstances.

2. The products of your group should be high-quality and I expect for the group to produce better products than would result from individual work.

3. For this project, your work should be detailed and grammatically correct. Phase assignments that are too short, rife with spelling errors or grammatically embarrassing will not receive passing grades.

4. If you submit group work for grading by e-mail then all of the group members should be sent a Cc of the e-mail message. None of the individual reports (below) are group work.

※ weekly log ↦ 5. You will need to keep a weekly log of group activities for the final group work report (described below in §2.3.3).

2.2 Rationale for Peer Assessment Reports[*]

I need to see your peer-assessments because they are the only way I can learn what is happening in your group and act to help you improve or intervene to resolve problems.

I also use self- and peer-assessments to

- help students take more responsibility for their success and to be more active and engaged learners;

- give students a way to understand user centred design and software design more deeply;

- give students (especially senior undergraduates) more control over their work;

- produce better and larger projects than would be possible without groups;

- give students a chance to develop leadership skills; and

- develop skills that are important in the workplace.

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[*]Sources: Schwartz/Ryerson, Holmes/Dalhousie (see §2.4).

2.3   Reports by Individual Students (Peer Assessment)

Each student must submit all of the following reports. These are not group work. I prefer to receive these reports by e-mail in PDF or text format, but hardcopies submitted to the TA are also acceptable. These reports will be confidential between their authors and me (the professor).

2.3.1   Group Leader Reports

The members of your group will take turns leading the group for phases of the project. You must all work together during each phase and part of the leader's responsibility will be to ensure that the work is shared equally. The group leader will also be responsible for coördinating meetings, activities, and documentation for that phase.

Where there are three members in a team, one of you will be the leader for the task analysis, another one will be a leader for the design document, and the third member will be leader for the testing strategy. There does not need to be a formal leader for the user & needs analysis. The title page of each project phase must identify the team leader (a simple way is to put an asterisk beside the name of the leader). ← title page

Where there are more than three members in a team, the others will lead for either the first demonstration or testing analysis phase. No team (for this project) should have more than five members.

Within 48 hours of completing their leadership phase the designated team leader *must* submit a teamwork report that:

1. lists all the team members and how each one contributed to the phase;

2. includes a ranking of the contributions with *no ties* (someone must have made the biggest contribution, and someone else the least);

3. shows how the leader made sure that the work was fairly divided amongst the team members.

2.3.2   Per Phase Group Work Evaluations

Within 24 hours of each phase of your project being completed you should submit a peer assessment of every member of your group (including yourself). These assessments are intended to help you and your teammates to work effectively and to alert me to potential problems that I could help you with before they become serious.

The form to use for these assessments is reproduced in the website.

Your grade for these reports will depend on the quality of your rationale. Be brief and to the point. Remember that you are assessing contributions not effort. No report should have more than one page of additional notes.

2.3.3   Final Group Work Reports aka Fairness Evaluations *(Required)*

After the final project is due all team members must submit their own group evaluation reports. Each team member will write their own report.

In the report you will tell me what you did in the project, what other members of your group did and how your team made sure that the work was divided fairly between all of you. You should keep a log of all the activities your group does each week to help you in writing the report.

The deadline is shown in §1.2 (on page 1); A few more details are in §10 (on page 19).

> **The Leader and Fairness reports are mandatory.**
> **You cannot receive a passing grade for the project without submitting both of these reports.**

2.4 Sources used for groupwork (especially peer assessment)

Susan Holmes of Dalhousie University provided excellent advice about the design of every aspect of the teamwork part of this project.

I also found the following sources particularly helpful as I developed the peer assessment of groupwork process and form. Prof. Holmes helped refine the form.

- *Improving Teaching and Learning Group Work and Group Assessment* (2004 Edition) from the University Teaching Development Centre (UTDC) at Victoria University of Wellington.

  I found Appendix D (Group Member Contribution) especially helpful so I have based parts of my form on it.

- *Peer and Self Assessment of Student Work* Prepared by Michelle Schwartz, Research Associate, for the Learning & Teaching Office at Ryerson University.

  - Parts of the rationale are drawn from lists on pages 1 and 7.
  - I found the example of the *Indiana University's School of Medicine Peer/Self Assessment Program Self Assessment* form by Carolyn Hayes (which is described as being adapted from the University of Rochester School of Medicine and Dentistry 'Peer Assessment Program') so helpful that I use the assessment scale in my form and have based much of my form on it.

- *Assessment Matters: Self-Assessment and Peer Assessment Teaching Development* by Dorothy Spiller (February 2009), produced by the Teaching Development Unit at Waikato University.

- *Methods for assessing groupwork* from the University of Waterloo's Centre for Teaching Excellence at ⟨URL:https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/developing-assignments/group-work/methods-assessing-group-work⟩ (undated; last accessed 2013-09-10).

  I adapted a few of their examples of aspects of team functioning (e.g. 'generating ideas and solutions' and 'willingly taking on unpopular jobs') for my form.

3 User and Needs Analyses

To determine the tasks that the user needs to perform with your system's interface, you might interview potential users, evaluate existing software (e.g. shareware) or both. Note in your report if you did or did not interview potential users.

Because **you are not allowed to interview anyone from outside of the class** unless you have specific permission from one of the FCS CSBREB[*] or Dalhousie's SSHREB[†] **you are allowed to interview members of other groups so long as your interviewees do not also interview you**.

Your report will include two parts and must be double-spaced. Each part should be at least one page long, but the entire document should be less than six pages long[‡].

3.1 User Analysis

It would be best if your analysis was based on *two* groups of potential users of your system. Only one of those groups should be similar to students in this class. If you are not interviewing anyone from outside of the class then you will need to combine your imagination with some easily-gathered background facts.

Your report should include the following information for each of the groups:

1. Characterize the users as a group — who are they?

2. How will they use the system?

   - Who uses the system (will they do it themselves or will someone else do it for them)?
   - What benefit will the users get from the system (why should they use it)?
   - What is the environment in which it is used (e.g. an office, home, car)?

3. What skills do they have?

   - computer skills
   - skills in the domain of the system

4. What, if any, other important characteristics do the users have?

5. What interview questions did you use?

6. How did you choose these people to be interviewed?

Recommendations for *Interview-based* User Analyses

- To be meaningful you need to interview at least six people (i.e. three from each of two populations, five from each is even better).

- You should be able to show that the people you have chosen (your sample population) is representative of your target populations.

- None of your interviewees should be friends of yours, and you should not interview someone from another group that is also interviewing someone from your group.

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[*]Faculty of Computer Science's Course-based Research Ethics Board
[†]Social Science and Humanities Research Ethics Board
[‡]Copies of forms, responses, etc. that appear in an appendix to the document will *not* contribute to the page count.

3.2 Needs Analysis

Your analysis should have the following three parts:

Goal a statement of the expected use of the system

Assumptions and Constraints

1. You will need to refer to these estimates later in the project for the risk analysis (§5.3). The estimates should depend largely on the expected value of a product that will fulfill the needs. The value is not necessarily commercial: it can also be the value to the potential users, and satisfaction for the project team for example.

   ※estimate of resource constraints ↦

   - what do you need to assume about the available hardware, information, etc. for the system to work;
   - roughly how much will it cost (in effort to build, price to buy, and resources to create and use, etc.); and
   - what world-view does this system relate to (e.g. if people are more efficient then the company will make more money, or that helping people to be fully satisfied with their jobs is our most important goal).

2. It is much better to say what is needed than to jump to conclusion of how to satisfy the need(s). For example if you think that your implementation should use a website then explain why, perhaps because it can be used from any location, rather than specifying anything about how it will be implemented or presented to the users.

List of Features

   - less than one page long; and
   - specific things a user could, and would want to, do with the system.

⊙ Grading form is in the website

3.3 Grading Principles

Your analyses will be graded according to the grading scale in Appendix A (on page 19). It is particularly important that you describe the characteristics and needs of people from more than one population.

3.4 Readings for User & Needs Analyses

☛ For each phase of this project you should prepare yourself by studying the assigned readings in at least *one of* Heim's *The Resonant Interface* [5] or Stone et al.'s *User Interface Design and Evaluation* [20].

In *Heim* [5] Chapter 4 until §4.3 (pp. 101 – 119)

In *Stone et al.* [20] Chapters 2 and 3

(Optional) Related Readings

   - §6.4 (Soft systems methodology) of *Dix et al. (1998, 2e)* [2];
   - Chapter 2 (Thinking About Users) of *Hackos and Redish* [4];
   - Chapter 2 (User Profiles) especially part of the final example (pp. 64 – 65) of *Mayhew* [13]; and
   - In *Preece et al. (2002)* [15]:
     - §6.3, §7.1–§7.5, §13.1 & §13.2, and
     - Box 8.2 (pp. 251 – 252).

4   Cognitive Hierarchical Task Analysis (CHTA)

For this phase you will be performing a cognitive task analysis (CHTA) for the system for which you will later develop an interface. The point of the CHTA is to determine what users need (or want) to do to achieve their goals. In this phase you will produce at least the first four levels of a detailed hierarchical description of users' goals and sub-goals. The first level is one task name that describes the reason to use the whole system. The second level is a list of the major cognitive subtasks that users perform. At levels 3 and 4, the major subtasks are decomposed.

You should **not** be be making any design decisions in your decomposition. The task analysis is an early analysis activity in which requirements are gathered. It is one of the definitional phase in your project, therefore **feasibility** of implementation **should not be a consideration** in your task analysis.

The tasks must all be actions! For example, in the case of a cookbook/recipe management system, you might call a task 'Manage ingredients' rather than 'Ingredients'. Some of the tasks will have sub-tasks and others will be categories of tasks that are grouped together.

☞ **Do not include any tasks that are specific to any implementation.** See §4.5 for more details.

4.1   How to proceed

If you have not already identified users' goals through the user analysis and initial feature list, then you will need to do it before you can develop a complete task analysis*. To determine the tasks that users need to perform to fulfill their goals you may need to (re-)interview typical users and evaluate existing software. If you are working on a bibliography management tool or library catalogue then the CS librarian can show you some existing software programs and websites.

4.2   Notes

As you know, *goals* are what the users want (or need) to do and *tasks* are the steps that users need to do to achieve those goals.

Keep in mind that you can have more than one group of users (e.g. librarians, and library patrons).

4.2.1   Supporting users' goals

We use the name task analysis for historical reasons. A more apt name might be detailed description of users' goals and sub-goals. The point of the Cognitive Hierarchical Task Analysis (CHTA) is to determine what users need (or want) to do to achieve their goals. Only when you have described what users need to do are you ready to find ways to help them to achieve those goals. Tasks such as 'authenticate user with system' or 'sort records' are not related to goals but rather to a particular hypothetical system.

You should not limit your CHTA to describing tasks that you think can be carried out using software. The point of the CHTA is to determine what is needed and how the users will think about what is needed before you design something. If you limit yourself to only feasible things too early then you cannot free yourself to think of breakthrough designs, and you are likely to design a system with mediocre functionality and an interface that users must adapt themselves to, instead of a system with better functionality that supports users without forcing them to adapt themselves to software.

4.2.2   The user's cognitive and behavioural domains

Because the focus in this assignment is on cognitive tasks, the tasks that you describe will most often be decisions that the users will need to make.

The tasks that you describe *must* be what the user *wants* to do, not what the user might need to do, to work with some hypothetical system that you might create later. One of the purposes of the CHTA is to help you to think of the users' needs without consideration for what is feasible. Preparing a CHTA is a way for you to broaden your thinking, to consider possibilities that might not otherwise occur to you.

4.2.3   Task Analysis and Design

Do **not** think of the CHTA as **design**. It is an early analysis activity and, like all such activities, it is about requirements gathering to give you the information you need as source material for the design phase. Feasibility will be dealt with in phases that come after the CHTA.

---

*Your task analysis does *not* need to be for the same product you proposed in your Needs Analysis (§3.2).

4.3 Hand in

A graphical diagram (chart) and corresponding textual description are both required. Your chart should be in the style of one of (a) *Shepherd*'s[18] Figure 3.13 (on p. 54), (b) *Kirwan and Ainsworth*'s[7] Figure 3.14 (on p. 110) or (c) *Preece et al. (2002)*'s[15] Figure 7.13 (on p. 233). You may draw the diagram or chart by hand only if you are extremely neat, otherwise use a computerized drawing package.

For each task, give a written description of its function. Include the following details in tabular format:

Identification

- What is the name of this task?
- What is the goal of this task?

Location in Hierarchy

- What sub-tasks define this task?
- Is this task a subunit of a larger task?

Requirements (input) & Results (output)

- What kinds of inputs or actions does this task require from the user?
- What kind of 'visible'* outputs or results occur when this task is performed?

Non-interface Aspects[†]

- What non-interface functions does this task require? or
- What automatic actions does this task expect from the system?

Other[†] • What special characteristics of this task should be recorded?

⊙ Grading form is in the website

4.4 Approximate Grading Scheme[‡]

Professional appearance *and* format	20%	
Clean and clear		
See §4.3		
Breadth of analysis	25%	$\geq 15\%$ required to pass
basic tasks and parts		$\approx 15\%$ for basics
non-essential tasks and parts		
Depth of analysis	25%	$\geq 15\%$ required to pass
accurate descriptions of tasks		
sufficient details in tasks		
at least 3 tasks need to be ≥ 4 levels deep[§]		
Organization of analysis	30%	$> 20\%$ required to pass
independent of implementation		
tasks relate to users' goals not to system actions		
structure of tasks and subtasks reflect users' goals		

> **If your task analysis is not acceptable then you will need to do it again before you can move on to the next phase[¶].**

---

*'Visibility' in Don Norman's terminology[14] means perceivable.

[†]Most tasks will have neither non-interface nor other aspects. The description for tasks that do not have such aspects should be 'none' or 'N/A'.

[‡]See Appendix A, on page 19 for more details.

[§]The (unnumbered) top-level task is at level 1. Task 1.2.3, for example, would be at level 4.

[¶]The late penalty for work that must be done again may be reduced but it will not be eliminated.

4.5   Suggestions

Typical Errors to Avoid

- Lack of detail;

- Inconsistencies between the items in the chart and the written descriptions;

- Spelling and grammatical errors.

- Tasks which refer to implementation details rather than to the user's goals (e.g. selecting from a menu, sorting paper records or pop-up windows confirming data entry are all bad);

  Every time you think of a task to include in the CHTA you should ask 'Why does this need to be a task? What need or desire of the user does it help to fulfill?' If the answer is that it will be a necessary step for the type of system that you think you will develop then you need to rethink that task. Tasks in the CHTA are steps users must take to achieve their goals *independent of any particular implementation*.

  It sometimes helps when planning tasks to think of two different implementations (notes on paper and a distributed database application for example) to decide if the task makes sense in both implementations, *but* you still need to be sure that doing the tasks in either way will support the user's goals. To carry the example further: you can sort notes on cue cards and you can sort records in a database, so sorting may seem like a sensible task. However when you ask yourself why the user will want to sort records, you will find that for most CHTAs the sorting to make something easier find — so the *real goal* is to find something (perhaps by recognizing it when they see it or perhaps by name or other attribute or datum). Similarly, users do not want to search but they might want to find; so 'find' could be a goal but 'search' would not be a goal.

- Describing a hierarchical menu structure not a hierarchical task analysis (writing the description from the programmer's perspective, rather than the user's perspective is bad);

  Not all hierarchies are menus. If tasks can appear in more than one place you can label them as repeated and describe them in only one place in the chart. Remember that although the CHTA is hierarchical it is *not* a menu.

Best Practices

The best task analyses are easy to read and refer to. I suggest that you make sure that yours include these properties:

- the pages and tasks are numbered; and

- each of the tasks is described on one page, that is the task description is not split across a page boundary. Often three tasks can fit comfortably on one page.

There are many ways to make good hierarchical task decomposition charts however the best ones tend to have these properties:

- Anything that makes it easier to find the description that corresponds to the chart entries is good. For example, labeling tasks with numbers that correspond to the hierarchy in the chart can help, e.g. task 1.2.3 is part of subtask 1.2 which is part of task 1. Task 1 is part of the top-level task, which is not numbered.

- Where special symbols are used (e.g. ★ for tasks that are defined elsewhere, slashed corners for optional tasks, boxes that contain tasks to indicate that they must be performed in order, dashed and solid lines) there is a legend explaining their meaning.

4.6   Readings for Your Task Analysis[*]

In *Heim*[5] §4.3 especially §4.3.1 (pp. 119 – 124)

In *Stone et al.*[20] Chapters 2 and 3

In Your Handout

- A chapter about HTA by *Annett*[1]

- *Shepherd*[18] pp. 26 – 33, 54
  about task analysis framework, example on p. 54

- *Dix et al. (1998, 2e)*[2] pp. 261 – 268

    - §7.2 (Differences between task analysis and other techniques),
    - §7.3 (Task decomposition),
    - §7.4 (Knowledge-based analysis)

- *Dix et al. (2004, 3e)*[3] pp. 532 – 538
  §15.6 (Sources of information and data collection)

(Optional) Related Readings

- *Kirwan and Ainsworth*[7] describe hierarchical task analysis on pages 104 – 118 and describe a case study on pages 324 – 339.

- Chapter 7, particularly §7.6 and §7.7 of *Preece et al. (2002)*[15]

    Note that you are required to prepare a more detailed and formal task analysis than is described in that textbook.

- §20.2 and §20.3 (pp. 413 – 419) of *Preece et al. (1994)*[16] give examples of a hierarchical task analyses.

    If you follow the examples in *Preece et al. (1994)* then be wary of the implementation-specific parts at the bottom left of Figure 20.1 and the lower levels of Figure 20.2.

- *Mayhew*'s[13] Chapter 3 description of procedures for generating task analyses may be helpful.

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[*]You need to prepare by studying the readings in *Heim* or *Stone et al.*

5   Design Document

The design document will be a record of the decisions you made about what the users will need to accomplish their tasks. As with all parts of the project, you may change it later but you must make a detailed record of your decisions so that you can refer to them at anytime. In a commercial venture the design document would also be used to communicate with clients.

The design document will be in two parts: a conceptual design and a concrete design.

5.1   Conceptual Design

The conceptual design is about the things that the user will use and the actions the user will take with those things. We call those things *objects*. The objects are very much like data structures in program code, but do not show any syntactic details of program code yet. I do want to see descriptions of the code that you would write but I do not want you encumbered by program syntax.

Your document must answer these questions:

- What things will the user work with?[*]

- How will the user get access to, and use, those things?[†]

5.1.1   Objects

You need to specify:

- What objects to use;

- What the properties of those objects are;

- How those objects and properties will be represented conceptually;

- How users will get access to those objects.

5.1.2   Actions (aka Operations)[‡]

We call the actions that users can do with your objects 'actions' or 'operations'. You need to specify:

- What are the necessary actions/operations;

- How will users select those actions/operations (through your system);

- How will users perform those actions/operations.

Remember that actions/operations are often about how a user can get to use instances of an object.

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[*]*Hix & Hartson*[6] Table 1.1, p. 7 call these 'interaction components of the interface'.

[†]*Hix & Hartson*[6] loc. cit. would call these parts of the 'interface software (to support interaction)'.

[‡]*Heim*[5] and *Stone et al.*[20] use the term 'action' for what some other authors call 'operations'.
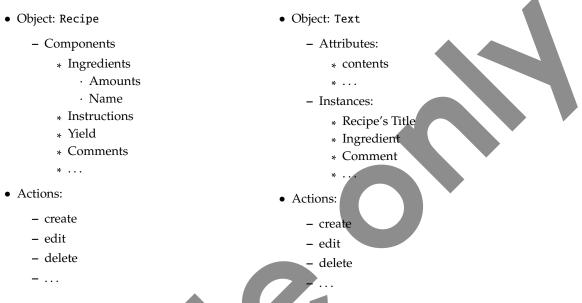
5.1.3 Presentation

You may present these details in any way that you think is meaningful. What matters is evidence that you have given sufficient thought to the design. Your conceptual design should be broad enough to cover everything and deep enough that there is clearly some way that it could be implemented.

I have found that some of the clearest presentations have used a hierarchical format such as those shown in the following two columns[*]:

- Object: `Recipe`
  - Components
    * Ingredients
      · Amounts
      · Name
    * Instructions
    * Yield
    * Comments
    * . . .
- Actions:
  - create
  - edit
  - delete
  - . . .

- Object: `Text`
  - Attributes:
    * contents
    * . . .
  - Instances:
    * Recipe's Title
    * Ingredient
    * Comment
    * . . .
- Actions:
  - create
  - edit
  - delete
  - . . .

Note that in the example above some objects have *components* (subparts) and others have *attributes* (properties). Objects with components have many parts. Objects with properties have many aspects or attributes, but these are not the same as parts[†].

When you refer to other other parts of your design in the written description use numeric identifiers and names. The numeric identifiers can be page numbers or might refer to a hierarchy with which you label your objects etc. just like you should have labeled tasks in your CHTA.

5.2 Concrete Design

In the concrete design you show how you think you will put your design into practice. This exposition is typically done with drawings or sketches that give the impression of the overall interface and some important parts in more detail. If you choose to do drawings or images from screen building software (e.g. Visual Basic or OmniGraffle) then you should include some text to annotate your figures.

※standards of appearance ↦ Your interface should be original and support users doing the tasks you specified in your task analysis, and in the user analysis. Make your concrete design detailed but don't try to make it perfect. It needs to be detailed enough for use but if it looks too much like a finished product it can be too hard to change later. Hand-drawn designs are perfectly acceptable if they are legible. Remember iteration is the key — you will need to change your design later.

5.3 Risk Analysis

You must include a brief assessment of whether or not your design is consistent with the estimate of resource constraints from your previous Needs Analysis (§3.2 on page 6). If the design is not consistent with that earlier estimate or if it is for a different product than the Needs Analysis then prepare an updated estimate and rationale for the change. The entire risk analysis section should comprise fewer than 200 words.

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[*]This example is specifically for a cookbook/recipe management system.
[†]See *Stone et al.* [20] §10.4.2, pp. 147 – 149 for more details about the differences between attributes and components.

5.4   Hand in

I need to see evidence that you have considered the implications of your design, used your (modified) task analysis, and are making good progress towards the final deadline.
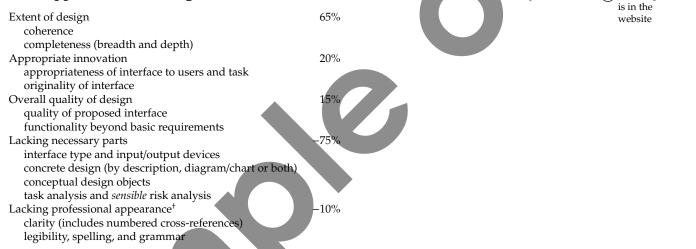
Your design document must be *at least* 5 pages long and include both stages and a risk analysis. Hand in your (modified) task analysis along with the design document.

If I told you that you had to modify your task analysis before moving on to the design document, *or if* you received a grade of $\mathcal{B}^-$ (or below) for the task analysis, then you *must* redo your task analysis before I will grade your design document.

↩ acceptable ※ CHTA

DDs without CHTAs are incomplete

⊙ Grading form is in the website

5.5   Typical Errors to Avoid

- Lack of detail;

- Spelling or grammatical errors;

- Inconsistency between the design and task analysis;

- Icons or command names that are not relevant to the user.

5.6   Approximate Grading Scheme*

Extent of design	65%
coherence	
completeness (breadth and depth)	
Appropriate innovation	20%
appropriateness of interface to users and task	
originality of interface	
Overall quality of design	15%
quality of proposed interface	
functionality beyond basic requirements	
Lacking necessary parts	−75%
interface type and input/output devices	
concrete design (by description, diagram/chart or both)	
conceptual design objects	
task analysis and *sensible* risk analysis	
Lacking professional appearance†	−10%
clarity (includes numbered cross-references)	
legibility, spelling, and grammar	

5.7   Readings for Design Document Phase‡

Steve Dow. How prototyping practices affect design results. *interactions* v. 18 n. 3 (May+June 2011) pp. 54–59.
⟨URL: http://doi.acm.org/10.1145/1962438.1962451⟩.
(**Optional**: recorded lecture at ⟨URL:http://youtu.be/nrNSfuGacZw⟩, 1'5.12'')

In *Heim* [5]
- §2.3 and Chapter 5 are most important
- Chapters 6, 10 – 14 are less important

In *Stone et al.* [20]
- Part 3 (Ch. 8 – 19) especially Ch. 8, 9, and 14
- Terms defined in §10.4.2, on pp. 147 – 149

(Optional) Related Readings
- Chapter 3 of *Lewis & Rieman* [8]

- Pages 236 – 238, and Chapter 8 of *Preece et al. (2002)* [15]

- Chapters 21 – 23 of *Preece et al. (1994)* [16] discuss some specific activities in the development of interface design documents. Chapter 22 is of particular interest.

- The terminology from *Hix & Hartson* [6] is described on pages 7, 132 – 144.

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*Negative numbers indicate maximum deductions; See also Appendix A (on page 19).
†See note on page 12 about the standards of appearance for your *concrete* design.
‡You need to prepare by studying the reading (or video) by Dow **and** a reading in either *Heim* or *Stone et al.*

6   Testing Strategy

You can start this phase *without* feedback about your design document

In this phase your group will develop the documents and plans needed to evaluate your prototype system with actual users. You will need to submit your plans to me and to an outside Authority. I will grade your methodology and suggest changes; the Authority will decide if you are allowed to use your methodology. If you cannot show that you used an approved methodology then you will be penalized in the next phase.

※Ethics authority ↦

You must not collect any data *from users who are not enrolled in this class* **without approval of** your methodology (including the consent form) by the **the Human Research Ethics authority**[*]. (You may however perform pilot testing since no data is being collected.) Exceptions are more clearly explained in §6.4.

You will need to develop your testing methodology and documents before you can get your methodology approved by the Authority. On the course website you will find a (9-page) PDF form to use for your application to the Authority and a (7-page) PDF file including instructions and a template for a consent form. You will need to prepare an application and a consent form for submission to the Authority. Your consent form should be on Dalhousie letterhead but it will be acceptable to include a copy of the university's crest instead.

> **Submit your application to the ethics authority as soon as possible.**
> The authority's evaluation of your proposal is separate from your professor's grading.

6.1   Hand in

1. scenarios of activities for users to perform (these should be based on your task analysis and should include a mixture of representative and critical tasks);

2. a list of measures you plan to use in your testing (where the reason for a measure is not obvious you should include a justification for how it will be used later); and

3. a description of the protocol you will use when interacting with the users (the instructions you will give to users, the forms you will use to record the test, how you will perform the test, a copy of the consent form you will use, etc.).

☞ **Do not delay submitting your testing strategy** because your methodology and consent form has not been approved. You must have an approved methodology and consent form to conduct the testing but **I can give you useful feedback** even if they have not yet been approved.

6.2   Suggestions

- Plan to have all of your experimental participants perform tasks in the scenarios. You will need *at least* five participants plus pilot testers[9]. Serious testing of earliest prototypes requires at least eight participants.
  Plan to take careful notes of any comments, problems, and other noteworthy events that occur during testing. Plan to record what users do with the system as well as taking notes yourselves.

- Remember that if you use a paper prototype then one of your team will not be able to take any notes, so plan accordingly.

★★
You must use two methods

- Use a (modified) version of one of QUIS **or** SUMI to collect post hoc impressions. (There is a copy of part of QUIS[†] in *Shneiderman*[19] on pp. 136 – 143. Information about SUMI is available online at ⟨URL: `http://www.ucc.ie/hfrg/questionnaires/sumi/`⟩.)[‡]
  and the *System Usability Scale*.

- Gary Perlman's *Web-Based User Interface Evaluation with Questionnaires* has references to other questionnaires. Note that privacy laws might not permit you to collect or store questionnaire data outside of Canada. However *Dalhousie's Online Survey Service* webpage describes a service that you might be allowed to use.

6.3   Optional

- Include scripts which describe what the user should do with the interface. These can be used to test if the interface works the way you think it should and also to ensure that users understand the interfaces parts.

- Plan to use a table with headings such as those below to help you record events during the testing.

Time	Problem or Issue	Effect on Performance

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[*]Our Human Research Ethics authority is the Faculty of Computer Science's Course-based Research Ethics Board. To maintain the reviewers anonymity you should send submission to your professor to pass on to the reviewers.

[†]I have licensed a copy of QUIS for use in the Faculty of Computer Science. If you want to use it please ask me.

[‡]SUMI, QUIS, *Dalhousie's Online Survey Service*, and *Web-Based Interface . . .* URLs confirmed on 28 June 2013.

6.4   Exceptions to Ethics Requirements

The only exceptions to the requirements for prior approval of the Ethics Authority are that you are allowed to:

1. debug your testing strategy with potential users so long as you do not collect any data; this is called 'pilot testing'. If someone helped you with pilot testing then you should not use them for actual testing.   ↤ pilot testing

2. if time is running short you may test with other students in this class, but you will need to note which of your testers were from the class in the analysis document that you submit.

6.5   Grading Principles

⊙ Grading form is in the website

Your strategy and supporting documents will be evaluated using three criteria: (1) completeness of your plan (type of data to be collected, how data is to be collected, range of tasks used, etc.), (2) extent of preparation, and (3) professional appearance. A perfect strategy is one which shows me that you are prepared to begin serious testing immediately. Strategies which are disorganized, untidy or do not appear professional for other reasons will be penalized as much as one grade level.

Typical Errors to Avoid

- Lack of detail, specifically:
    - pilot testing not mentioned[*],
    - number of test participants not specified,
    - cognitive walkthroughs (for baseline performance) mentioned but no evidence of planning or completion included;
- Not planning to test enough of the system[10];
- Long documents without tables of contents;
- Inconsistency between description and forms;
- Recording made by hand and only by one person;
- Texts to be read to users that are in the passive voice.

6.6   Readings for the Testing Strategy Phase[†]

Highly Recommended Readings

- ★ Chapter 8 in *Heim*[5]
  or Part 4 (Ch. 20 – 27), especially Ch. 21 and 23 of *Stone et al.*[20]
- ★ *Maner*'s notes on formative evaluation[11]

(Optional) Related Readings

- ★ *Dix et al. (1998, 2e)*'s[2] Chapter 11 is an excellent overview of testing and evaluation.
- ★ *Maner*'s notes on scenario development[12] are highly recommended.
- Chapters 10 – 12, §13.3, and Chapter 14 of *Preece et al. (2002)*[15]
- Part VI of *Preece et al. (1994)*[16] discusses evaluation and testing. If you refer to that book then pay particular attention to Chapters 30 and 31.
- *Rubin*[17] has some very straightforward, practical advice.
- For initial testing and test design see §4.1 and §4.3 of *Lewis & Rieman*[8].
- For user testing see Chapter 5 until §5.6 (and Exercise 5.1) of *Lewis & Rieman*[8].

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[*]You should plan for pilot testing, but I don't require it to be done by the time this plan is due.
[†]You need to prepare by studying the readings in *Heim* or *Stone et al.*

7   Demonstrations

Demo. of first version	in class time*
Demo. to class & professor	during class*

I will be examining your work to see how much you have accomplished by these times. The first demonstration is to the professor and grading assistant only.

7.1   Private demonstration of first version to professor

I will be examining your interface to see how much you have accomplished by this time, and to offer practical advice specifically to your group. To do that I will determine how many of the features you specified in your task analysis and described in your design document you have implemented, and how well they have been implemented. You progress will be graded according to the criteria in Appendix A (on page 19).

I am expecting (1) to see partly complete prototypes, (2) to see nearly complete testing strategies, and (3) for you to have clear ideas of what you will be doing next and expected dates of completion. However I will help you with *whatever* you have. Please bring *all* of your project documents and grading forms, and most especially your prototype and testing plans to the classroom.

If you need a computer for your prototype then please bring one of your own. I need to see how your prototype will operate in the test sessions. I will examine your documents, test the prototype myself and then ask you to run me through at least one of your test scenarios.

Please arrive a few minutes early (if you don't have a class just before) so that no demonstrations are delayed.

7.2   Demonstration of 'final' version to class and professor

The demo to the class is your chance to show everyone what you have accomplished and learned through the project. I expect you to

- briefly introduce the class to your problem domain before

- showing them your prototype,

- discussing what you learned through testing, and

- what changes you have made since then.

How you do this is entirely up to you. I only require that you introduce the problem domain at the start of your presentation.

⊙ Grading form
is in the
website

Approximate Grading Scheme

The grading scheme for your demo of your 'final' version will be approximately as follows:

Current implementation &
Planned Improvements
    quality of implementation
    breadth of functionality   65%
    completeness
Insight into testing
    lessons learned from testing
    lessons learned about testing methods   15%
Appropriate innovation   10%
    as defined in §5.6 (on page 13)
Presentation quality   10%

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*The order of demonstrations will be posted in advance.

8   Analysis of Testing Data

Based on your users' experiences with your system, give a detailed list of the improvements that you plan to make in the next version of your user interface. For each improvement, specify why your improvement should be made. You must address each item of user feedback.

You must **show that the Ethics Authority approved your testing procedure** to get a passing grade for this phase. If you have not already turned in proof that your methodology and consent form has been approved then you must include that proof with this report.

The **sole exception** is if your testing was only inspection methods (aka discount usability testing) in which no person from outside of the team participated in the testing. Groups of three or more students who use *only* those methods *with* prior permission from the professor cannot earn a grade above $\mathcal{B}^-$ for this phase. Groups who use only those methods without prior permission should not expect a grade above $\mathcal{D}$ for this phase.

8.1   Suggestions

A summary table with headings such as in the one below *might* help to organize the parts you will need.

Problem	Effect on Performance	Importance	Frequency of Occurrence	Proposed Solution	Cost to Fix	Resolution

8.2   Lessons Learned

Reflect on what you have learned through testing. I would like you to tell me: (1) what things you did in testing that were the most helpful, and (2) if you could do the testing again, how would you change your strategy?

8.3   Grading Principles

When grading your report I will be considering three factors: (1) the thoroughness of your analysis of the problems in your interface, (2) how specific you are about solutions, and (3) the rationality of your suggested changes.

In the best planned improvements documents every statement is justified, every comment and issue found through testing, demonstrations, etc. is addressed, and there is a clear rationale for all suggested changes to the design.

Typical Errors to Avoid

- not including page numbers, table of contents, etc. to make the structure of the document clear
- not including the (original) raw data or a copy of the the raw data

8.4   Readings for the Analysis of Testing Data Phase[*]

In *Heim*[5]   Chapter 8

In *Stone et al.*[20]   Chapters 25 and 28

(Optional) Related Readings

- *Dix et al. (1998, 2e)*'s[2] Chapter 11 has some good advice about analysing test data; and
- *Lewis & Rieman*[8] from §5.5.5 to the end of Chapter 5 is about evaluating data collected during testing.

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[*]Additional readings may be assigned or provided by the professor. You need to prepare by studying the readings in *Heim* or *Stone et al.*

9   Final Project and Portfolio

Turn in:

- copy of your prototype
    - hardcopy of all non-code materials
    - *if* you wrote code: softcopy on CD-ROM of source and executable files
- a neat and well-organized portfolio of your project, including
    - all analyses,
    - user assessments,
    - planned improvements,
    - source code (*if applicable*),
    - signed consent forms (see the note below),
    - anything else to show how your project evolved, and
    - written list of the tasks that you identified in your task analysis and a description of which features/objects support your tasks and how the tasks were supported.

The **signed consent forms** must be included, but should be in a separate section *and* envelope so that they can be removed from the portfolio after grading.

9.1   Suggestions

I expect a detailed and well-organized document. The portfolio should be something that can be referred to repeatedly. Consider including a table of contents, indexing tabs or both.

9.2   Approximate Grading Scheme*

Current implementation	45%
breadth of functionality	
quality of implementation	
Planned improvements	40%
completeness	
appropriately detailed	
Appropriate† innovation	15%
interface	
functionality & automation	
(appropriate to users and task)	
Completeness of documents }	−40%
Consistency of documents }	
Professional appearance	−15%

---

*Negative weights indicate maximum deductions; See also the grading scale in Appendix A (on page 19).

†Innovation must be appropriate for the specified users and their specified tasks. See the earlier definition in §5.6 (on page 13), and §2.2 of *Lewis & Rieman*[8] as quoted in your lecture notes.

10   Fairness Evaluation (0% — Required, Max. deduction 50%)

Due at the start of class on Tuesday 03 December

It is essential that the group work is done fairly. Each of the group members must do this assignment on their own. Refer to your weekly log of group activities to help you complete this report. See item #5 of §2.1 (on page 2) for some details.

Every student must tell me (briefly):

1. What work each team member did to complete the project; and

2. What steps the team took to ensure that the work was divided fairly.

3. How fair they thought the overall division of project work was. In particular I need to know if anyone thought it was unfair.

11   Project Assessment (0% — Optional)

Please submit in the course mailbox or to the TA by noon on Tuesday 10 December

I will appreciate it if you would use a few minutes to write me briefly:

1. What you learned (about yourself, working in groups, and human-computer interaction) by working on this project; as well as

2. If you had do the project again, how would you do it differently?

☛ You may submit these 'lessons learned' anonymously. I want to know what you truly think about your experience with this project.

A   Application of Dalhousie Grading Scale

From Dalhousie University Undergraduate Calendar Academic Regulations §17.1 (Grade Scale Definitions)[*]:

Grade	Definition	
$\mathcal{A}$-level	Excellent	Considerable evidence of original thinking; demonstrated outstanding capacity to analyze and synthesize; outstanding grasp of subject matter; evidence of extensive knowledge base.
$\mathcal{B}$-level	Good	Evidence of grasp of subject matter, some evidence of critical capacity and analytical ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.
C-level	Satisfactory	Evidence of some understanding of the subject matter; ability to develop solutions to simple problems; benefiting [sic] from his/her university experience.
$\mathcal{D}$	Marginal Pass	Evidence of minimally acceptable familiarity with subject matter, critical and analytical skills.
$\mathcal{F}$	Inadequate	Insufficient evidence of understanding of the subject matter; weakness in critical and analytical skills; limited or irrelevant use of the literature.

Grading Forms

Draft grading forms are available from the website.

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[*]⟨URL:http://www.registrar.dal.ca/calendar/ug/ACRG.htm⟩, retrieved 26 July 2009.

B   Calendar (Fall 2013 – 2014)

September						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				✗5		
		10	11	12		
		17	18	19		
		24	25	26		

October						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1		3		
		8	9	10		
	✗14	15	16	17		
		22	23	24		
		29	30	31		

November						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		5	6	7		
	✗11	✗12	13	14		
		19	20	21		
		26	27	28		

December						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		3		5		
		10				
		16				

Notes

1. There will be no class on 05 September; Classes will begin on Tuesday 10 September.

2. Dalhousie will be closed on 14 October and 11 November.

3. A test is scheduled for Thursday 24 October.

4. There will be no classes at Dalhousie on 12 November.

5. The Registrar's Office will schedule the exam for sometime between 05 and 16 December.

6. **Deadlines** are at the beginning of class (or tutorial) on Tuesdays, Wednesdays, and Thursdays, and noon otherwise.

References*

[1] John Annett. Hierarchical task analysis (HTA). In Neville Stanton, Alan Hedge, Karel Brookhuis, Eduardo Salas, and Hal Hendrick, editors, *Handbook of Human Factors and Ergonomic Methods*, Chapter 33 (pp. 33-1 – 33-7), CRC Press, 2005. ISBN 0-415-28700-6.

[2] Alan Dix, Janet Finlay, Gregory Abowd, and Russell Beale. *Human-Computer Interaction*. Prentice Hall Europe, second edition, 1998. ISBN 0-13-239864-8.

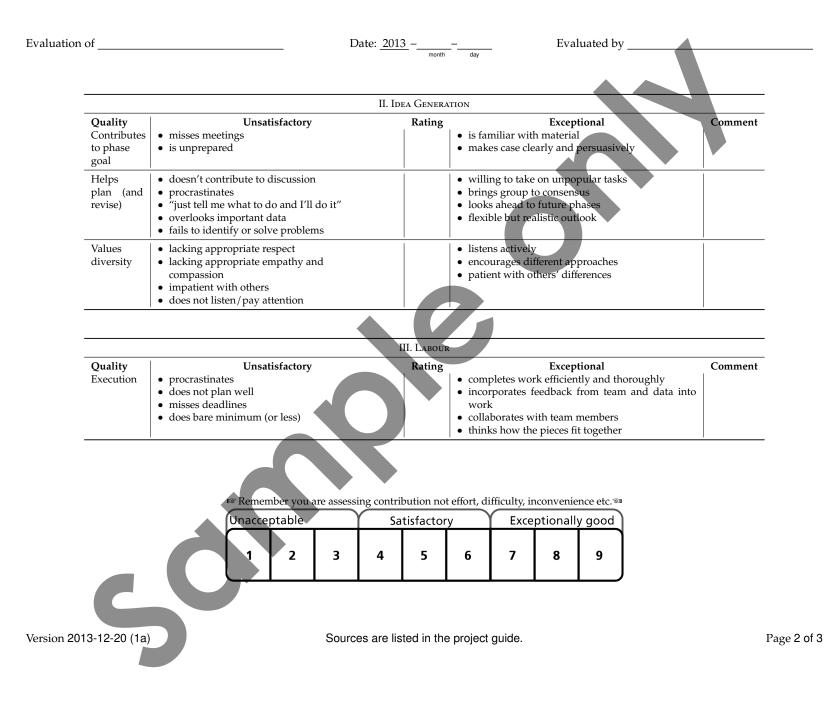[3] ⎯⎯⎯⎯⎯. ⎯⎯⎯⎯⎯. Prentice Hall, third edition, 2004. ISBN 0-13-046109-1.

[4] JoAnn T. Hackos and Janice C. Redish. *User and Task Analysis for Interface Design*. John Wiley & Sons, 1998. ISBN 0-471-17831-4.

[5] Steven G. Heim. *The Resonant Interface: HCI foundations for interaction design*. Addison-Wesley, 2008. ISBN 978-0-321-37596-4.

[6] Deborah Hix and H. Rex Hartson. *Developing User Interface Ensuring Usability Through Product & Process*. Wiley Professional Computing. John Wiley & Sons, Inc., 1993. ISBN 0-471-57813-4.

[7] B. Kirwan and L.K. Ainsworth (editors). *A Guide To Task Analysis*. Taylor & Francis Inc., 1992. ISBN 0-7484-0057-5 (cloth) / 0-7484-0058-3 (paper).

[8] Clayton Lewis and John Rieman. Task-centered user interface design: A practical introduction, 1993, 1994. At ⟨URL:ftp://ftp.cs.colorado.edu⟩ (as flat files), ⟨URL:http://hcibib.org/tcuid/⟩ (as a webpage) & ⟨URL:http://www.cs.dal.ca/~jamie/TCUID/readme.html⟩ (in PDF).

[9] James R. Lewis. Sample sizes for usability tests: Mostly math, not magic. *interactions* v. 13 n. 6 (Nov. + Dec. 2006) pp. 29–33. ⟨URL: http://doi.acm.org/10.1145/1167948.1167973⟩.

[10] Gitte Lindgaard and Jarinee Chattratichart. Usability testing: what have we overlooked? In *Proceedings of the SIGCHI Conference on Human factors in Computing Systems*, (pp. 1415 – 1424), 2007; ⟨URL:http://doi.acm.org/10.1145/1240624.1240839⟩.

[11] Walt Maner. Formative usability evaluation, 15 March 1997. ⟨URL:http://csweb.cs.bgsu.edu/maner/domains/Formeval.htm⟩. Copy at ⟨URL:http://www.cs.dal.ca/~jamie/teach/WaltManer/Formeval.htm⟩.

[12] Walt Maner. Scenario method, 15 March 1997. ⟨URL:http://csweb.cs.bgsu.edu/maner/domains/Scenario.htm⟩. Copy at ⟨URL:http://www.cs.dal.ca/~jamie/teach/WaltManer/Scenario.htm⟩.

[13] Deborah J. Mayhew. *The Usability Engineering Lifecycle: A practitioner's handbook for user interface design*. Morgan Kaufmann Publishers, Inc., 1999. ISBN 1-55860-561-4.

[14] Donald A. Norman *The Psychology of Everyday Things*. Basic Books, 1988. ISBN 0-465-06709-3.

[15] Jenny Preece, Yvonne Rogers, and Helen Sharp. *Interaction Design: Beyond Human-Computer Interaction*. John Wiley & Sons, Inc., 2002. ISBN 0-471-49278-7.

[16] Jenny Preece, Yvonne Rogers, Helen Sharp, David Benyon, Simon Holland, and Tom Carey. *Human-Computer Interaction*. Prentice-Hall Europe, 1994. ISBN 0-201-62769-8.

[17] Jeffrey Rubin. *Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests*. John Wiley & Sons, Inc., 1994. ISBN 0-471-59403-2.

[18] Andrew Shepherd. *Hierarchical Task Analysis*. Taylor & Francis, 2001. ISBN 0-7484-0838-X.

[19] Ben Shneiderman. *Designing the User Interface: Strategies for Effective Human-Computer Interaction*. Addison-Wesley, third edition, 1998. ISBN 0-201-69497-2.

[20] Debbie Stone, Caroline Jarrett, Mark Woodroffe, and Shailey Minocha. *User Interface Design and Evaluation*. Morgan Kaufmann Series in Interactive Technologies. Elsevier, 2005. ISBN 0-12-088436-4.

[21] Susan Weinschenk, Pamela Jamar, and Sarah C. Yeo. Analysis (Chapter 2; pp. 13–49). In *GUI Design Essentials for Windows 95, Windows 3.1 World Wide Web*. Wiley Computer Publishing. John Wiley & Sons, Inc., 1997. ISBN 0-471-17549-8.

*The materials referenced here were used to create this project, and may help the student. See also §2.4, on page 4.

Evaluation of _____   Date: <u>2013</u> – <u>_____</u> – <u>_____</u>   Evaluated by _____
month   day

	I. GROUP MANAGEMENT FUNCTIONS			
Quality	**Unsatisfactory**	**Rating**	**Exceptional**	**Comment**
Valuable team member	• lacks initiative • only assumes responsibility when forced or for personal reasons • untrustworthy, deceptive, hides own mistakes, takes credit for everything		• willing to take on unpopular tasks • able to defer to the groups' needs • helps form cohesive team	
Supports work and discussion of teammates	• does not seek feedback • is defensive and fails to respond to feedback		• presents extra material • supports claims with appropriate references • clearly explains ideas / produces innovative ideas • seeks to understand views of others • truly helps other to learn	
Leadership	• is dictatorial • refuses to share workload • lacks initiative • dominates the group		• plans effective meetings • ensures equitable participation • helps team reach consensus • encourages comments from everyone • listens to others • is consistent and follows-through • takes initiative • seeks appropriate responsibility • deals well with different personality types • manages domineering members • delegates to use team members strengths	
Cares about teamwork	• only wants successful product • no interests in teamwork • hinders group process • pleases superiors while undermining peers		• supports others in sharing their ideas • works co-operatively • pays attention to team dynamics • permits appropriate time for building team rapport	
Prepared	• presents the minimal amount of material or ideas • seldom supports ideas with facts from class or readings		• always prepared for meetings • responsive • acts in a timely fashion • completes work efficiently and thoroughly	

☞ Remember *you are assessing contribution* — not effort, difficulty, inconvenience etc.✍

Unacceptable			Satisfactory			Exceptionally good		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Evaluation of _____   Date: <u>2013</u> – _____ – _____   Evaluated by _____
month   day

		II. Idea Generation			
Quality	**Unsatisfactory**	**Rating**	**Exceptional**		**Comment**
Contributes to phase goal	• misses meetings • is unprepared		• is familiar with material • makes case clearly and persuasively		
Helps plan (and revise)	• doesn't contribute to discussion • procrastinates • "just tell me what to do and I'll do it" • overlooks important data • fails to identify or solve problems		• willing to take on unpopular tasks • brings group to consensus • looks ahead to future phases • flexible but realistic outlook		
Values diversity	• lacking appropriate respect • lacking appropriate empathy and compassion • impatient with others • does not listen/pay attention		• listens actively • encourages different approaches • patient with others' differences		

		III. Labour			
Quality	**Unsatisfactory**	**Rating**	**Exceptional**		**Comment**
Execution	• procrastinates • does not plan well • misses deadlines • does bare minimum (or less)		• completes work efficiently and thoroughly • incorporates feedback from team and data into work • collaborates with team members • thinks how the pieces fit together		

☞ Remember you are assessing contribution not effort, difficulty, inconvenience etc.☜

Unacceptable			Satisfactory			Exceptionally good		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Evaluation of _____   Date: <u>2013</u> – _____ – _____   Evaluated by _____
month   day