

Course-Management System: Final Report

Stuart Douglas
1214422

McMaster University
dougl2@mcmaster.ca

Matthew Pagnan
1208693

McMaster University
pagnanmm@mcmaster.ca

Rob Gorrie
1222547

McMaster University
gorrierw@mcmaster.ca

Derek Dagworthy
1214937

McMaster University
dagwordj@mcmaster.ca

ABSTRACT

The final report for a design project for a course-management system is presented here. The proposed course-management system allows university students to enroll in courses, view their schedule and perform other course-related tasks from a web portal.

Firstly, the proposed project and suggested improvements over existing systems are explained. To inform this, four Canadian university course-management systems were surveyed, and the surveys are presented after the suggested improvements. Each survey has a brief description of the software followed by a critique of the major usability flaws and strengths. Three personas are then presented to demonstrate the potential users of the system that guided the design process. Following personas, information about the usability tests conducted for this system is presented followed by the results, discussion about the results, and final conclusions about the project.

NOTE ABOUT FORMATTING

This document strictly follows the ACM CHI format. Extra spacing between paragraphs is created by LaTeX to better arrange content, and is not directly controllable by the creator. The format used for the Personas section is based off of the format given along with Milestone 2 to fit into the 2-column layout, with images included inline (which does not violate the ACM CHI template). Extreme care has been given to follow the specified format exactly, including fonts, margins, and figures.

INTRODUCTION

The project proposed in this document is the design of a new university course-management system. Through scrutinization of several pre-existing systems, we will apply design concepts discussed in class to determine what features and design choices are crucial to the success of a course-management system's design.

Users of the proposed system should be able to perform the following functions:

- enroll in courses
- change timeslots for lectures, tutorials, and labs of enrolled courses
- view weekly schedule
- view exam schedule

In the following section we will introduce several possible improvements that could be made to existing systems, informed by the system surveys conducted. These suggested improvements were incorporated into designs mockups for the new system, and into the final design of the working system.

Suggested Improvements to Existing Systems

We have outlined several improvements over existing systems that have been incorporated into the design of the new system. The software surveys identified several key areas of weaknesses, and solutions to those are presented below.

Dynamic Element

One of the highlighted points of weakness in all the systems surveyed was the ability to surface the most relevant data to the user quickly and consistently. To improve this aspect, the concept of an intelligent, “dynamic” element was proposed. This prominent element is the first thing users see on the home page of the new system. Several factors including the current date and enrollment status are used to determine which task the user is most likely to perform.

For example, when the user accesses the system during exam season, the element displays the student’s exam schedule. During the course registration period, the element displays information related to course registration. If a user is not yet accepted into University, the element displays their application status.

This dynamic element helps users quickly find the information they are looking for by making information more visible and easier to access. All functions continue to be displayed below in a static and consistent manner, in case the user wishes to perform a less common task.

Improved Navigation

Many tasks performed by users of course-management software are broken into several steps. A weakness of the existing products was in visually showing the user at which step they were at. To solve this, a “breadcrumbs” navigation element was added when the user is engaged in a multi-step task. This element shows which step the user is currently on, and includes the ability to go back to a previous step, or jump ahead to the first uncompleted step.

This visual indicator improves the user’s comprehension of how the system works, and gives them the ability to better navigate between steps. It also improves user satisfaction,

as they are less likely to become impatient when they know exactly how many steps they have completed and how many remain.

Smarter Schedule Generation

An initial proposal for the system was to have the system generate several possibly schedules based on the users wish-list, and rank them based on several factors such as early classes, gaps between classes and having certain days completely off. We do believe this would be a meaningful addition to a course-management system, however decided not to include it in the final product due to time and resource constraints.

RELATED WORK

Four course-management systems from Canadian universities were selected for review. For each system, a brief description was followed by a critique of the major usability flaws and strengths. From this, the main goals and tasks of users using the systems was extracted.

McMaster University – Mosaic

The purpose of the software is to allow students to manage their courses (enrolling, dropping etc.), and view information about their current status (current timetable, enrollment status, financial balance etc.). The main interface for the software consists of several collapsible modules encapsulating different aspects of the software in a main column. These include Academics, Finances, Personal Information, and Admissions. A small column to the right holds less common sections, such as Enrollment Dates and Graduation. The focus of this analysis is on two common tasks – enrolling in courses and viewing one's course schedule.

Critique

The largest usability flaws in Mosaic center around difficulty to access required information. Combined with an unintuitive and inconsistent navigation interface. The HTA for enrolling in a course demonstrates this through the large number of steps required to perform a routine and common task. Other functions are hidden behind dropdown menus, and are difficult to discover.

The navigation is separated into a top navigation bar separated by user-type (e.g. Students and Employees). Within the student center page, functions are separated into modules, an effective strategy to group related functions. Navigating to one of the sub-functions (such as enrolling in a course) presents secondary and tertiary menus below the main one. Navigation within one of these is handled by blue text hyperlinks back to previous pages. Native back and forward browser functionality does not work. There is little visual indication of where the user is beyond the navigation bars at the top, which do not go to a depth sufficient to cover all pages used when performing common actions, such as enrolling in a course.

Guelph University – WebAdvisor

Guelph University's course enrollment software, WebAdvisor, provides a variety of functions for students to manage their courses. The student page interface contains two columns – a main column with course-related news, and a righthand column with links to each of the functions (Register for Courses, View Schedule etc). These "function" pages are one column, and may contain several sub-pages as processes are broken into steps. Navigating between sub-pages is done using native browser back and forward buttons. If an error occurs, such as no courses found for specific search criteria, a large box is displayed with information about the error and the option to search for a solution.

Critique

There are a variety of usability issues associated with WebAdvisor that could be improved upon, especially in the area of navigation. There are also certain strengths to the system as compared to others surveyed. The navigation issues largely stem from a lack of consistent navigation elements to show the user where they are. For example, when enrolling in a course there are several steps that must be completed (refer to HTA – WebAdvisor, Enrolling in A Course). The user is not aware how many steps there are total, how many they have completed or how many remain. Another large usability issue is an inefficient use of space on the main page. The visibility of important functions is reduced by putting all functions in a small column to the right of the main content. This main content contains news items, such as exam period times and service outages, generally information that the user is less likely to need than the functions beside it.

WebAdvisor does do some things quite well from a usability perspective however. One of the most common tasks is enrolling in a course, and WebAdvisor has the most streamlined process of all universities surveyed. Although it is not always clear at which step the user is at as discussed above, the process is straightforward and contains much fewer steps than performing a similar task using a different system.

Carleton University – Central

Central is the course-management system for Carleton University. It has a similar feature-set to the other systems surveyed. This includes allowing users to enroll in courses and view their schedule. The user interface for Central primarily is based on text links to different pages, with very little use of icons or colour. The main student page is a one-column list of text links to the various student-related categories of functions. A tab bar at the top lets the user switch between different sections of the system including Student Services and Employee Services.

Critique

There are a large number of prominent usability flaws in Carleton University's course-management system. Visibility of common functions on the main page is very low, as a long

list of hyperlinks contains all the categories (e.g. Registration, Student Records etc) requiring the user to read each one until they find the correct one. Once a category is selected, then another list of hyperlinks to each of the functions in that category is shown (see figure 4). Again, the user must read through each one until they find the desired function.

Another large usability flaw is the poor mapping between many actions. For example, when adding a course, the user first enters a course number into one of several (unlabeled) input boxes, and then they click the Submit button (see figure 3). The submit button is aligned with other buttons for Class Search, which takes the user to a separate page, Reset, which undoes their changes, and Return to Worksheet which navigates the user to a page showing them their preferred courses. These buttons are not all related, and grouping them together may confuse the user.

Overall, Central is a relatively unintuitive system, requiring users to spend more time finding the information they need through poor mappings and a lack of a visual hierarchy.

Waterloo University – Quest

The Quest system is designed to let students manage several aspects of their university enrollment, such as course management, financial inquiries, and contact information. Students can also sign up for a GO Bus pass, view their grades and transcript, and check the status of scholarships and other applications. The main page is broken up into 8 collapsible sections, 4 main sections (Academics, Finances, Personal Information, Admissions) with another four sections in a sidebar (Holds, Finance Information, Academic Information, Other Useful Links). The critique will focus on enrolling in courses and viewing a user's course schedule.

Critique

Quest has some major usability issues when it comes to providing the user to information and functions they can use. The system is notorious for hiding options and menus from the user, requiring several screens of drill down menus before being able to access any meaningful options. The menus look unfinished or poorly formatted, and it is easy to become lost and confused while navigating the various pages. Navigation on the main page uses hyperlinked text, while traversing the deeper options is done using blue menu tabs. Native browser back and forward commands generally work as expected, which makes navigation a little more manageable.

PERSONAS

Presented are the personas used to develop our design. These personas were based off of the *Persona Template* as linked from the assignment outline from McMaster University, COMP SCI 4HC3. These personas were created to archetype the most common user types, and have been integral to developing a product that will satisfy all of them.

Trevor Clark

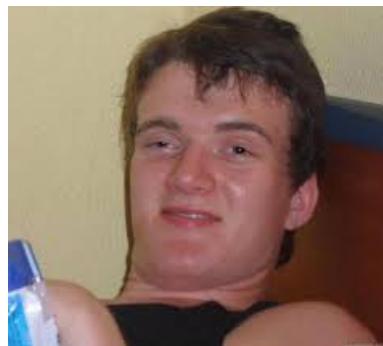


Figure 1: "When do classes start?"

- Born: London, ON
- Age: 22
- 3rd Year Engineering Student at McMaster

Trevor is a third year Civil Engineering student at McMaster. He currently lives 10 minutes away from campus with some friends he met in first year. Trevor's parents are paying for his tuition and he has a student loan which he uses to pay for rent and food.

Trevor is unorganized and rarely goes to class. He also forgets to hand in assignments on time. Trevor is not a part of any clubs and prefers to spend his free time with his housemates playing video games.

Trevor has trouble remembering important dates, like his course selection or when his exams are. When he searches for information, he usually gives up after five minutes if he cannot find what he is looking for. Trevor would like it if the new course management system was quick and easy to use. He also would not mind it if certain information was made more accessible during certain times of the year (easy to see link to exam schedule around exam season).

Candice Smith



Figure 2: "I don't know what electives I want to take for university next year"

- Born: Oakville, ON
- Age: 18
- Grade 12 High School Student

Candice has been accepted to the chemistry program at McMaster. Candice currently lives at home with her parents and will be moving into residence in the fall. Her parents are paying for her tuition, but Candice is paying for her residence and meal plan. Candice works part time at the Fortinos in her home town to save up money so she can go to the movies whenever new movies come out.

Candice has done well in all of her classes in high school and is a part of several high school groups; such as the volleyball team, track and field team and the Harry Potter fan club.

Candice has several electives that she can take, but she cannot decide which ones to enrol in. She has heard that she can change courses during the first couple weeks of class and plans on doing that if she ends up changing her mind. Candice has already made a list of classes she would like to take in her first year and is waiting for the course registration to open up. Candice would like the new course management system to allow her to browse all the courses available to her and would like it if there were descriptions for each course that she could read before she registers.

Adrian Lopez



Figure 3: "I have a lot of new things to get used to in Canada"

- Born: Mexico City, Mexico
- Age: 20
- 2nd Year Geography Student on Exchange to McMaster

Adrian is a geography student from Mexico on exchange at McMaster for the year. Adrian is living in a house 20 minutes away from campus with other students in the foreign exchange program. Adrian's tuition is being paid for by a grant he received for being a part of the foreign exchange program. His parents are giving him some money for rent and food but Adrian has to pay for some of it himself. Adrian is a hard working individual during the week and can be found in the Thode library between classes. Adrian likes to get all of his assignments done during the week so he can spend his weekend going to clubs with his housemates and friends.

Adrian is a part of the improv club which he regularly goes to. Adrian has chosen a light course load this year as he would like some time to experience Canada before he goes back to Mexico next September.

Since English is not Adrian's first language he sometimes has trouble reading and understanding websites that are primarily text, and he can get confused while navigating to the information he is looking for. Adrian would like it if the new course management system was easy to navigate and intuitive enough that he doesn't need to read an instruction manual to know how to use it.

DESIGN MOCKUPS

Please refer to the

USABILITY TESTS

Overview

This section of the document describes a plan for conducting a usability test for our course management software. This usability test plan will be based off of the Usability Test Plan Template created by the U.S. Department of Health & Human Services. The goals of this usability test are to establish a baseline of user performance, establish and validate user performance measures, and identify potential design concerns to be addressed in order to improve the efficiency, productivity, and end-user satisfaction of the product.

The usability test objectives are:

- To determine design inconsistencies and usability problem areas within the user interface and content areas.
 - Navigation errors - failure to locate functions, failure to follow recommended screen flow.
 - Presentation errors - failure to locate and properly act upon desired information in screens, selection errors due to labeling ambiguities
- Exercise the web site under controlled test conditions with representative users. Data will be used to assess whether usability goals regarding an effective, efficient, and well-received user interface have been achieved.
- Establish baseline user performance and user-satisfaction levels of the user interface for future usability evaluations.

Procedure

The participant's interaction with the application will be monitored by the facilitator seated in the same room. The facilitator will be responsible for taking notes and logging data during the tests. The facilitator will explain that the amount of time taken to complete the test task will be measured as well as how many errors were made. At the start

of each task the facilitator will inform the participant of the tasks objective.

Once the participant starts the task the facilitator will begin to time the participant. The facilitator will instruct the participant to ‘think aloud’ so that verbal record exists of their interaction with the application. The facilitator will observe and enter user behavior, user comments, and system actions. After the participant has completed all tasks they will be asked to complete a questionnaire.

Following is a list of the tasks the participant will complete. The reason the courses in tasks 1.1 and 2.1 are different is that dummy courses were used for the new system, and have different course codes.

- **Task 1.1** - Have user enroll in the following courses for *Winter 2016* through Mosaic, selecting lectures, tutorials, and sections so as to eliminate conflicts as needed:
 - ANTHROP 1AA3
 - ANTHROP 1AB3
 - COMPSCI 2DM3
 - BIOLOGY 1A03
- **Task 1.2** - Have user find their exam schedule for the Fall 2015 semester on Mosaic
- **Task 1.3** - Have user find their weekly schedule for the Fall 2015 semester on Mosaic
- **Task 2.1** - Have user enroll in the following courses using the new system selecting lectures, tutorials, and sections so as to eliminate conflicts as needed:
 - ANTHROP 4AA3
 - ANTHROP 4M03
 - COMP SCI 1TA3
 - BIOLOGY 2AA3
- **Task 2.2** - Have user find their exam schedule for the Fall 2015 semester using the new system
- **Task 2.3** - Have user find their weekly schedule for the Fall 2015 semester using the new system

Usability Metrics

Usability metrics refers to user performance measured against specific performance goals necessary to satisfy usability requirements. Scenario completion success rates, error rates and subjective evaluations will be used. Time-to-completion of scenarios will also be collected.

Scenario Completion

Each scenario will require, or request, that the participant obtains or inputs specific data that would be used in course of a typical task. The scenario is completed when the participant indicates the scenario’s goal has been obtained (whether successfully or unsuccessfully) or the participant requests and receives sufficient guidance as to warrant scoring the scenario as a critical error.

Errors

Errors are deviations at completion from the targets of the scenario. Obtaining or otherwise reporting of the wrong data value due to participant work flow is a error. Participants may or may not be aware that the task goal is incorrect or incomplete. Independent completion of the scenario is a universal goal. Errors may be procedural, in which the participant does not complete a scenario in the most optimal means (e.g., excessive steps and keystrokes). These errors may also be errors of confusion (ex., initially selecting the wrong function, using a user-interface control incorrectly such as attempting to edit an un-editable field).

Subjective Evaluations

Subjective evaluations regarding ease of use and satisfaction will be collected via questionnaires, and during debriefing at the conclusion of the session. The questionnaires will utilize free-form responses and rating scales.

Scenario Completion Time

the time to complete each scenario will be recorded.

RESULTS

DISCUSSION

CONCLUSION

In conclusion, We proposed a design for a new university course-management system with several new features to reduce the amount of time it takes for students to enroll into course and view their weekly and exam schedules. We then surveyed four university course-management systems which we critiqued. Personas were then created to demonstrate potential users of the system that guided the design process.

Once we finished making the course management website we created several usability tests to gather data on how much more effective our new system was compared to Mosaic. The responses from the questionnaires show that users preferred our new system over Mosaic. Our results also show that it took far less time for users to find their exam schedule with our system. Course enrollment times were also on average short than those on mosaic.

Our system is not perfect as it is very difficult to create an application that can appease everyone. Mosaic clearly allows for the user to do more things however, we believe that the areas that we focused on, course enrollment and schedule viewing that if were implemented to mosaic would be seen as usability improvements.

APPENDIX

Other Systems – HTA's

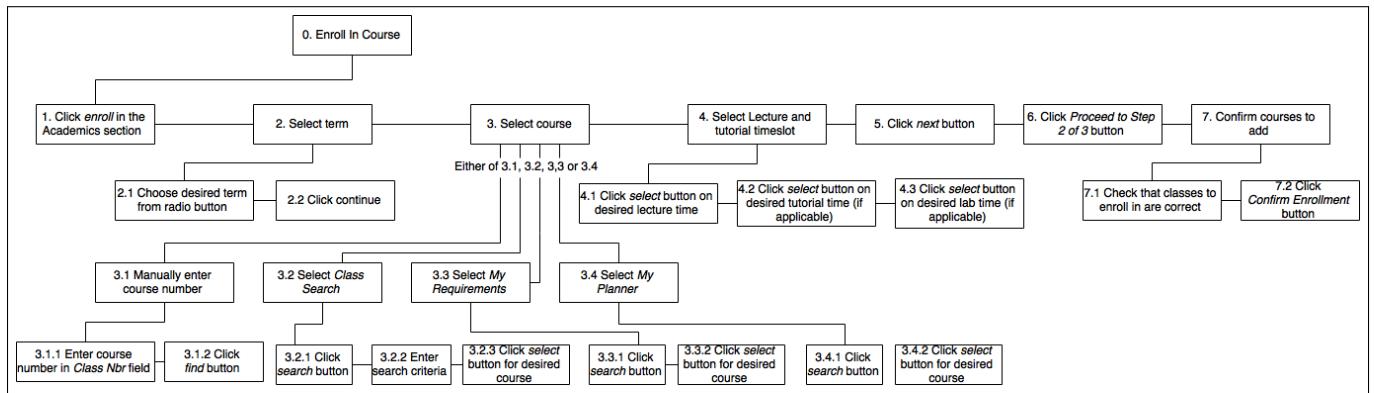


Figure 4: Mosaic HTA – Enrolling in a Course

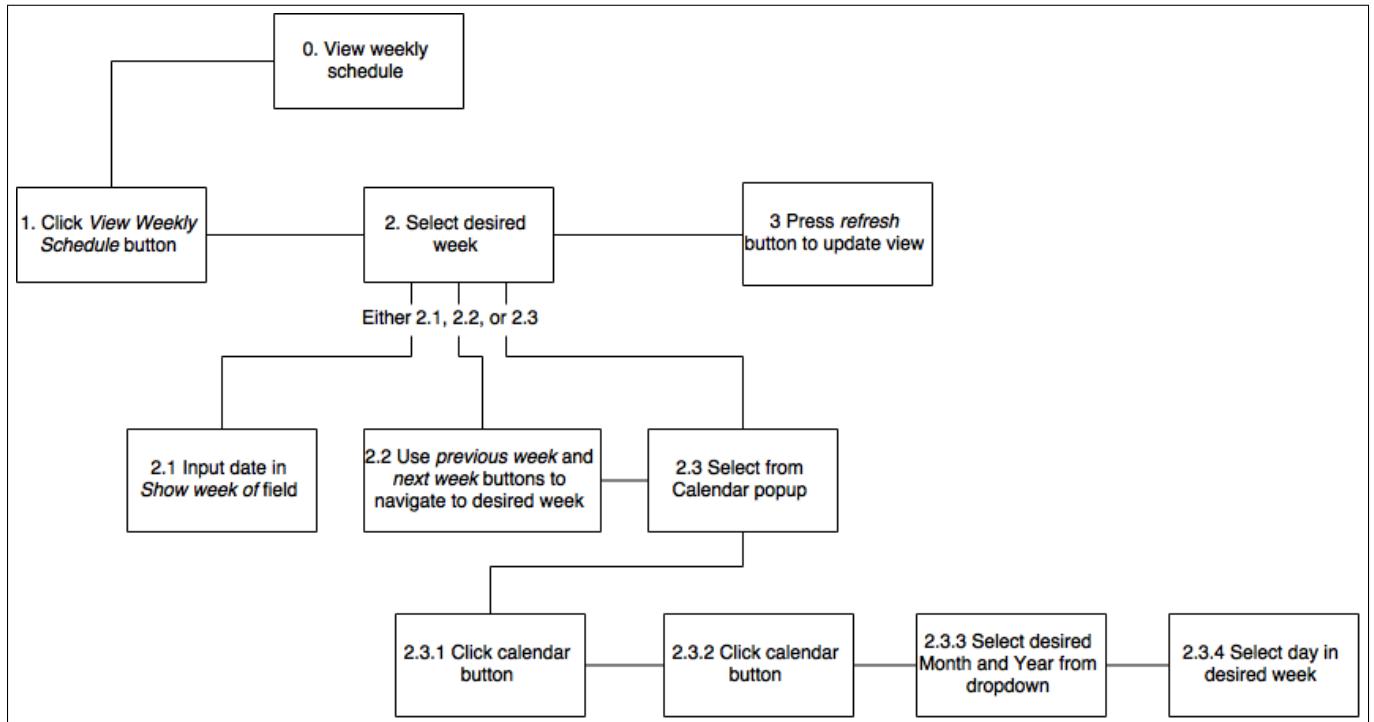


Figure 5: Mosaic HTA – Viewing Weekly Schedule

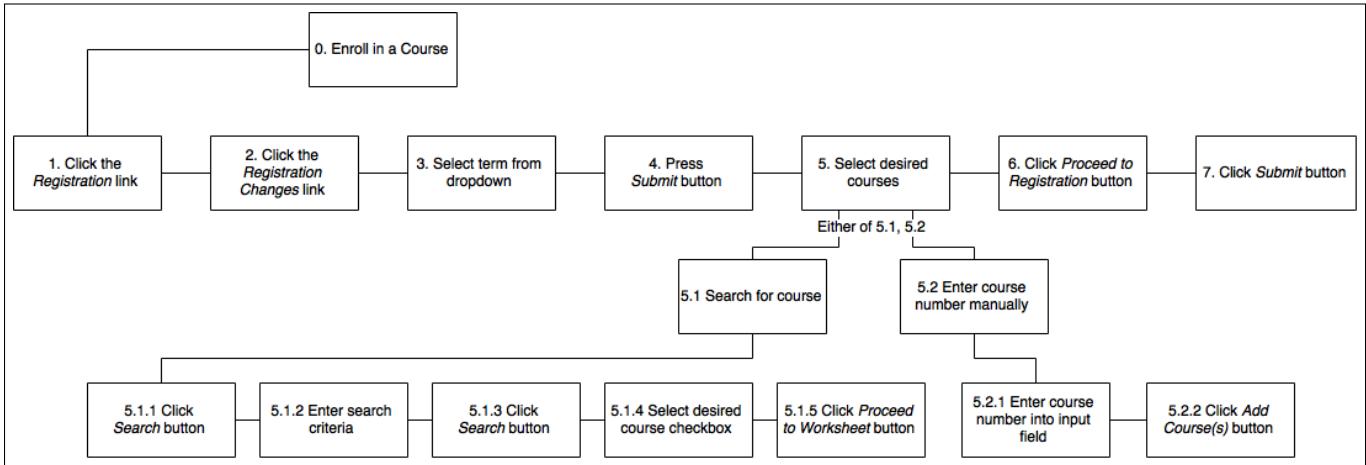


Figure 6: Carleton HTA – Enrolling in a Course

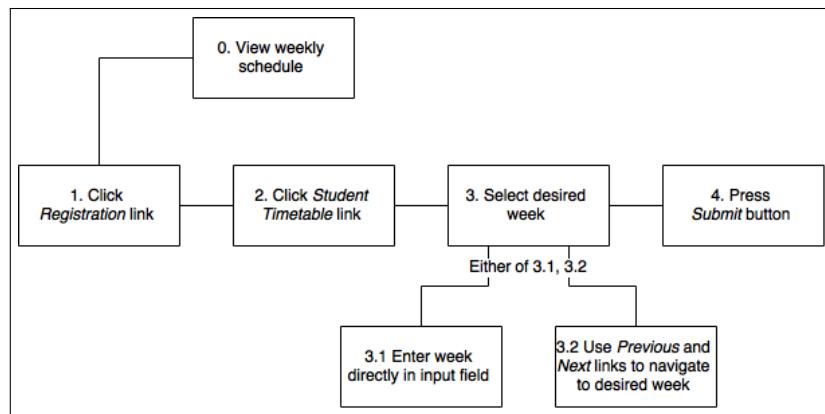


Figure 7: Carleton HTA – Viewing Weekly Schedule

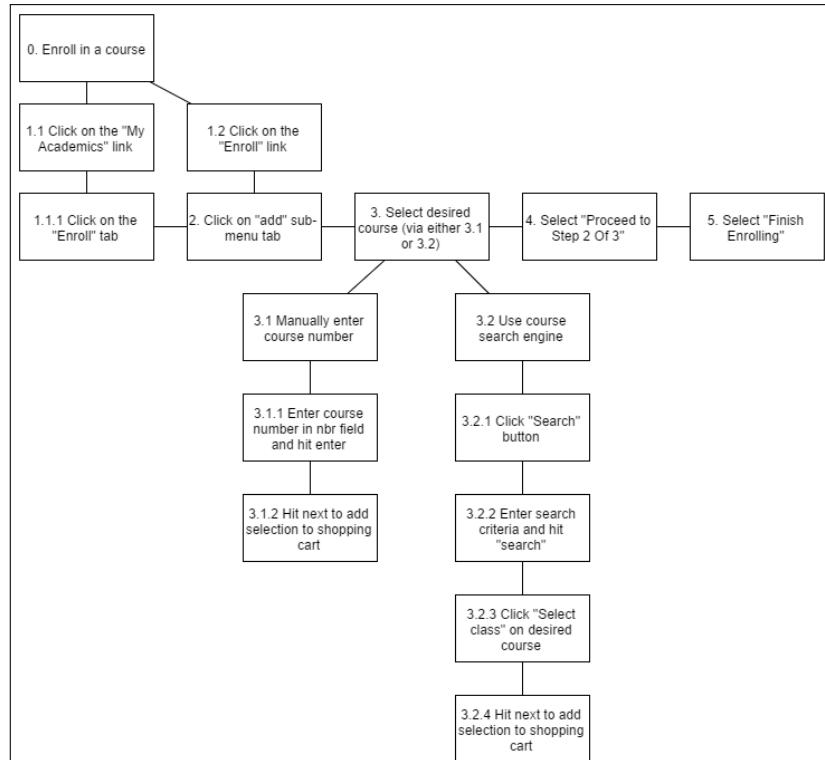


Figure 8: Quest HTA – Enrolling in a Course

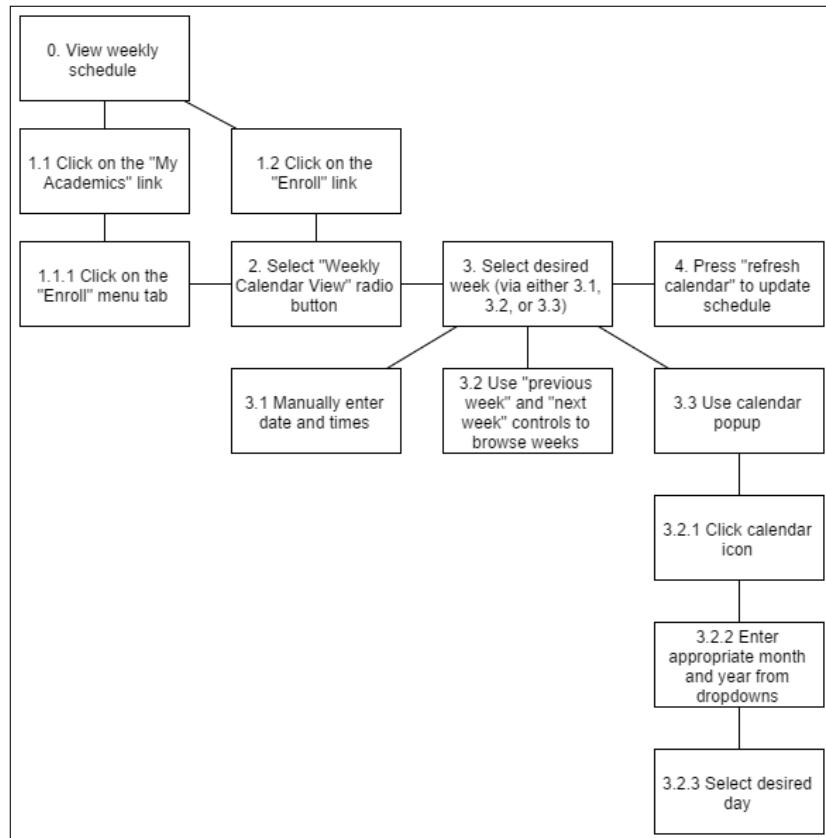


Figure 9: Quest HTA – Viewing Weekly Schedule

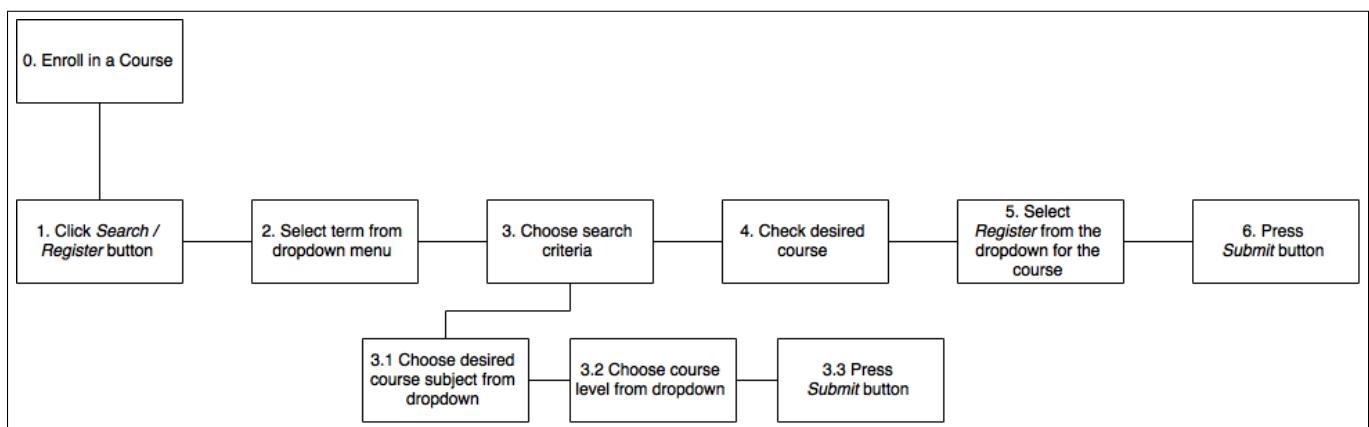


Figure 10: WebAdvisor HTA – Enrolling in a Course

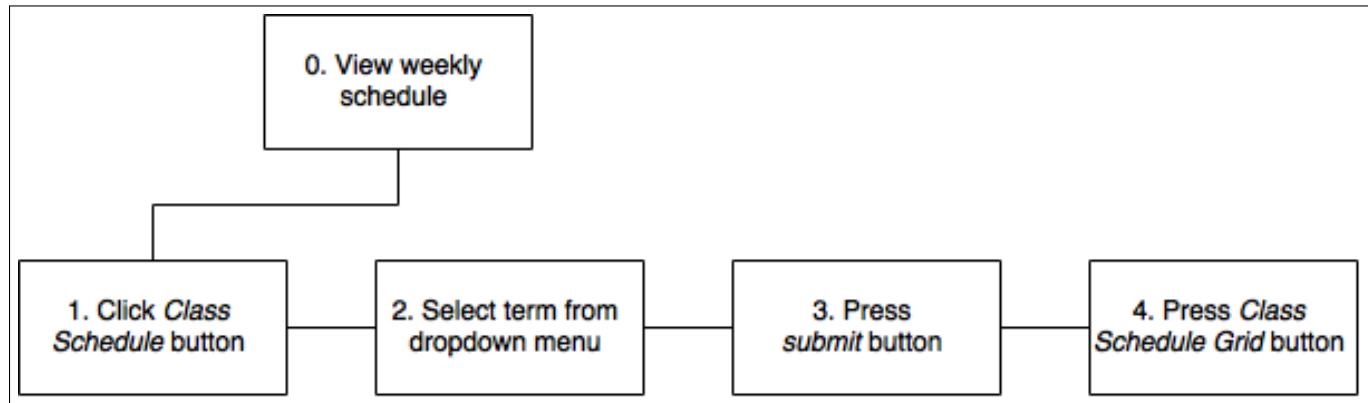


Figure 11: WebAdvisor HTA – Viewing Weekly Schedule

Other Systems – Screenshots

The screenshot shows the McMaster University Mosaic student portal. At the top, there are links for Favorites, Main Menu, Welcome STUART, Home, and Sign out. Below the header, the title "McMaster University Mosaic" is displayed with a logo. A navigation bar includes Home, Documentation, My Profile, My Work, Student Center, Student Guide, and Support. A user profile for "Stuart Douglas" is shown with a search bar and a "go to ..." button. Below this is a menu bar with Search, Plan, Enroll, and My Academics tabs. Under My Academics, there are buttons for my class schedule, add, drop, swap, and term information. A "Add Classes" section follows, with a sub-section titled "1. Select classes to add". It instructs users to select classes for another term, choose a term, and click "Change". A note says to proceed to step 2 if satisfied with class selections. Below this is a "2016 Winter | Undergraduate | McMaster University" section with a "change term" link. A "Find Classes" search bar is present, along with "Add to Cart" and "Enter Class Nbr" fields. A message states "Your enrollment shopping cart is empty." At the bottom, there are links for Class Search, My Requirements, and My Planner.

Figure 12: Mosaic – Screenshot

The screenshot shows the Carleton University "Add or Drop Classes" page. At the top, there are links for Personal Information, Student Services, Employee Services, and Financial Services. Below this is a "RETURN TO MENU | SITE MAP | HELP" link. The main content area is titled "Add or Drop Classes". It contains a list of instructions: To add a class, enter either the Course Reference Number (CRN) or the Course Subject/Number/Section (e.g. PSYC1001) in the Action pull-down list; To drop a class, use the options available in the Action pull-down list; Courses from your draft worksheet will already be added at the bottom; After all changes have been made, press the Submit button; For additional help with your registration, refer to the registration website. A note at the bottom says "Be sure to review your timetable after any registration changes to ensure that the changes have in fact taken effect." Below these instructions is a "Current Schedule" table with columns for Status, Action, CRN, Subj Crse Sec, Level, Cred, Grade Mode, and Title. One row is listed: Registered on Sep 16, 2015, Action None, CRN 14479 PSYC 5414 R, Graduate Studies and Research, 0.500 Standard Letter Grade, Grade Modeling. Below the table, course details are listed: Total Credit Hours: 0.500, Billing Hours: 0.500, Minimum Hours: 0.000, Maximum Hours: 99.000, Date: Nov 01, 2015 03:10 pm. A "Add Classes Worksheet" section follows, with a table for CRNs (or SubjCrseSecs, e.g. ENGL1234A). Buttons for Submit, Class Search, Reset, and Return to Worksheet are at the bottom.

Figure 13: Carleton – Screenshot

The screenshot shows the University of Waterloo Quest student portal. At the top, there is a "UNIVERSITY OF WATERLOO" logo and a "Menu" button. Below the menu, a "Student Center" link is visible. The main content area is titled "Lauren's Student Center". It features several expandable sections: "Academics" (My Academics, Course Selection (undergrad only), Academic Alerts, Go-Zero); "Finances" (My Account, Academic Integrity, Tax & Tuition, Promissory Note, Financial Aid, View Financial Aid, Scholarships and Awards); "Personal Information" (Demographic Data, Emergency Contact, Name/Address, Contact Information, Home Phone, Home Phone 9059696220); and "Admissions" (Information about pending applications). A note at the bottom states "You do not have any pending applications at this time."

Figure 14: Quest – Screenshot

The screenshot shows the WebAdvisor system. At the top, it says "Action for ALL Pref. Sections (or choose below)" with a dropdown menu. Below this is a "Preferred Sections" table with columns for Action, Term, Section Name and Title, Location, Meeting Information, Faculty, and Available/Capacity. Four rows are listed: RG - Register Winter 2016 AHSS*3010*01 (3811) Guelph-Humber Campus LEC Tues 06:05PM - 08:45PM GH, Room 324; RG - Register Winter 2016 CIS*4110*0101 (1624) Guelph LEC Mon, Wed, Fri 03:30PM - 04:20PM ALEX, Room 259 LAB Mon 12:30PM - 01:20PM JTP, Room 212; RG - Register Fall 2015 EDRD*3500*DE (7474) Guelph Recreation & Tourism Planning M. Staempfli 227 / 400; RG - Register Fall 2015 MGMT*3020*DE (8881) Corp Social Responsibility D. Rezania 18 / 150. Below this is a "Current Registrations" table with columns for Drop, Term, Pass/Audit, Section Name and Title, Location, Meeting Information, and Faculty. One row is listed: Drop Fall 2015 Pass/Audit GEOG*3490*DE (8091) Tourism and Environment Guelph EXAM Mon 08:30AM - 10:30AM (2015/12/07) Room TBA Room TBA Faculty C. McCallum. A note at the bottom says "If one of my choices is not available ALL don't process if any fail". A "SUBMIT" button is at the bottom right.

Figure 15: WebAdvisor – Screenshot

New System – Final Design Mockups

The Home page features the McMaster University logo at the top left. A user dropdown shows "John Smith". A navigation bar includes "Home", "View Schedule", "Search Courses", "Enroll/Drop", and "Support". Below the navigation is a large image of two students studying. A green button labeled "View Exam Schedule" is visible. A section titled "Exam Season" with the sub-instruction "Check your exam schedule here" contains a "View Exam Schedule" button. On the right, there are two boxes: "Enroll/Drop" (with "Search for Courses" and "Enroll/Drop" buttons) and "Schedule" (with "Weekly Schedule" and "Exam Schedule" buttons). Under "Wishlist", courses like COMP SCI 1BB3 and COMP SCI 1B06 are listed.

Figure 16: Final Mockup of Home Page

The Exam Schedule page shows the "Exam Schedule: Fall 2015" for the week of November 29 to December 5. A green box highlights the "Final Day of Classes: Fall 2015" on November 30. A red box highlights "Multiple Exams" on December 1. A blue box highlights the "First Day of Classes: Winter 2016" on January 4. The schedule table includes course details like COMP SCI 1X03 and COMP SCI 1AA3.

Figure 17: Final Mockup of Exam Schedule

The Weekly Schedule page displays the "Class Schedule: November 22-28, 2015" for the week of November 22 to November 28. A green box highlights COMP SCI 1X03 (031) on November 23 from 09:30-10:20. The schedule table shows various class times and locations for different courses like COMP SCI 1X03, COMP SCI 1AA3, and MATH 1A03.

Figure 18: Final Mockup of Weekly Schedule

The Search for Courses page has a search bar at the top. It features two main search criteria sections: "Select Subject" (set to COMP SCI) and "Select Level" (set to Level 2). An "OR" button allows users to enter a course code in the "Enter Course Code" field (e.g., 1A03). Buttons for "View Wishlist" and "Search" are at the bottom.

Figure 19: Final Mockup of Search Criteria Page

McMaster University

John Smith

Home View Schedule Search Courses Enroll/Drop Support

Search for Courses > Search Results

Search Results

Course Info	Times (final times selected when enrolling)					Enrolled	Action
	Monday	Tuesday	Wednesday	Thursday	Friday		
COMP SCI 1Z03 Intro to Programming Dr. S. Smith	Lecture 1 9:30-10:20			9:30-10:20	9:30-10:20	14/35	<button>Add to Wishlist</button>
				11:30-12:20			
	Lab 2	9:30-15:20					
COMP SCI 1A06 Computer Organization and Logic Dr. R. Samavi	Lecture 1 19:00-22:00					48/50	<button>Add to Wishlist</button>
				12:30-13:20			
COMP SCI 1B03 Algorithms and Data Str. Professor TBD	Lecture 1 8:30-9:20	8:30-9:20		8:30-9:20		150/150	<button>Add to Wishlist</button>
				13:30-14:20			
	Lab 1	14:30-17:20					
COMP SCI 1T03 Code Analysis Dr. M. Dagg	Lecture 2 10:30-12:20	10:30-12:20	10:30-11:20			27/85	<button>✓ On Wishlist</button>
				14:30-15:20			
COMP SCI 1X03 Computer Architecture Dr. S. Polgo	Lecture 1 14:30-15:20	14:30-15:20	14:30-15:20			4/50	<button>Add to Wishlist</button>
				11:30-12:20			
COMP SCI 1XX3 Computer Graphics Professor TBD	Lecture 1 11:30-12:20	11:30-12:20	11:30-12:20			32/65	<button>✓ On Wishlist</button>
				15:30-16:20			
COMP SCI 1D03 Theory of Computation Dr. P. Church	Lecture 2 10:30-11:20	10:30-11:20		10:30-11:20		52/150	<button>✓ Enrolled</button>
				16:30-17:20			
	Lab 1	12:30-14:20					

Back to Search Continue to Enroll

Figure 20: Final Mockup of Search Results Page

McMaster University

John Smith

Home View Schedule Search Courses Enroll/Drop Support

Search for Courses > Search Results > Enroll from Wishlist

Wish List

Course Info	Times	Monday	Tuesday	Wednesday	Thursday	Friday	Enrolled	Action
COMP SCI 1Z03 Intro to Programming Dr. S. Smith	Lecture 1 9:30-10:20				9:30-10:20	9:30-10:20	14/35	<button>Remove</button> <button>Enroll</button>
		Tutorial 3 4				11:30-12:20		
	Lab 2	9:30-15:20						
COMP SCI 1A06 Computer Organization and Logic Dr. R. Samavi	Select... 8						48/50	<button>Remove</button> <button>Enroll</button>
MATH 1ZZ3 Linear Algebra Professor TBD	Lecture 1 11:30-12:20		11:30-12:20	11:30-12:20			27/150	<button>Remove</button> <button>Enroll</button>
		Select... 4						

Enrolled Courses

Course Info	Times	Monday	Tuesday	Wednesday	Thursday	Friday	Enr.	Action
COMP SCI 1X03 What are computers? Dr. T. Murphy	Lecture 1 9:30-10:20				9:30-10:20	9:30-10:20	14/35	<button>Save Changes</button> <button>Drop</button>
		Tutorial 3 1				11:30-10:20		
	Lab 2 1	13:30-16:20						
ECON 1B03 Introduction to Macroeconomics Dr. R. Kressa	Lecture 2 19:30-22:20						48/50	<button>Save Changes</button> <button>Drop</button>
		Tutorial 1 1				11:30-12:20		
						11:30-12:20		

Figure 21: Final Mockup of Enroll from Wishlist Page

New System – HTA's

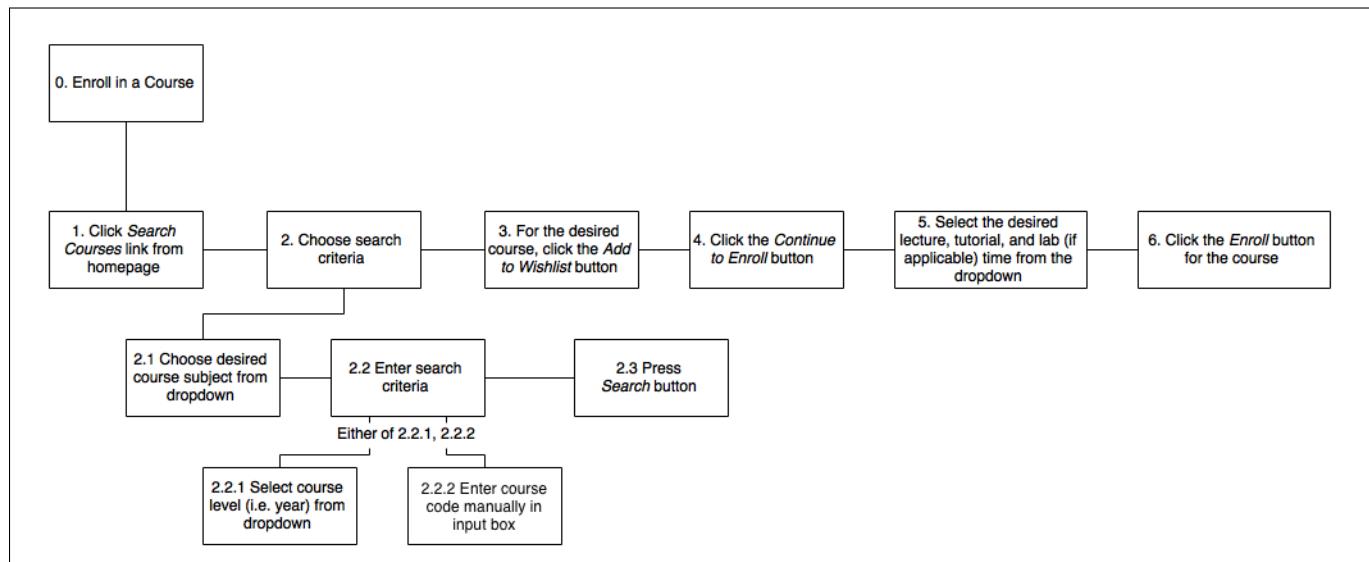


Figure 22: New System HTA - Enrolling in a Course

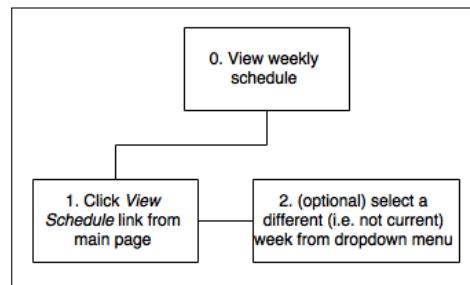


Figure 23: New System HTA - View Weekly Schedule

New System – Screenshots

The screenshot shows the homepage of the McMaster University new system. At the top left is the McMaster University logo. On the right is a user dropdown menu showing "John Smith" with options for Account Settings, My Profile, and Log Out. Below the header is a navigation bar with links for Home, View Schedule, Search Courses, and Enroll/Drop. The main content area features a large image of students taking an exam. Overlaid on the image is the text "Exam Season" and "Check your exam schedule here." A green button labeled "View Exam Schedule" is visible. Below this are two large boxes: "Enroll / Drop" containing "Search Courses" and "Enroll/Drop" buttons, and "Schedule" containing "Weekly Schedule" and "Exam Schedule" buttons. The "Enroll / Drop" box also shows a "Wishlist" section with course information for ANTHROP 1AB3 and COMP SCI 1TA3. The "Schedule" box shows "Enrolled Courses" for COMP SCI 1TA3 and ANTHROP 4M03.

McMaster University

John Smith

Account Settings

My Profile

Log Out

Home

View Schedule

Search Courses

Enroll/Drop

Exam Season

Check your exam schedule here.

[View Exam Schedule](#)

Enroll / Drop

[Search Courses](#) [Enroll/Drop](#)

Wishlist:

ANTHROP 1AB3
Introduction to Anthropology: Race, Religion and Conflict

Schedule

[Weekly Schedule](#) [Exam Schedule](#)

Enrolled Courses:

COMP SCI 1TA3
Elementary Computing and Computer Use

ANTHROP 4M03
History of Anthropology

Figure 24: New System Screenshot – Home Page



John Smith

[Home](#)[View Schedule](#)[Search Courses](#)[Enroll/Drop](#)[Support ↗](#)[Weekly Schedule](#)[Exam Schedule](#)

Exam Schedule: Fall 2015

December 2015

29	30	1	2	3	4	5
		COMP SCI 1TA3 16:00 - 13:00 ITB AB102				
6		BIOLOGY 2SI3 13:00 - 16:00 JHE 303	9	10	11	12
13	14	15	16	17	18	19
20	21	ANTHROP 4M03 13:00 - 14:00 MDCL 1044	22	23	24	25
27	28	29	30	31	Jan 1	2
3	4	5	6	7	8	9

First Day of Classes: Winter 2016

[View Weekly Schedule](#)

Figure 25: New System Screenshot – Exam Schedule



Weekly Schedule

Exam Schedule

Weekly Schedule: Fall 2015

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:30					
9:30	COMP SCI 1TA3 - T01 9:30 - 10:30 ITB AB102				
10:30					
11:30					
12:30	COMP SCI 1TA3 - C01 12:30 - 13:30 ITB AB102		ANTHROP 4M03 - C01 12:30 - 13:30 MDCL 1044	COMP SCI 1TA3 - C01 12:30 - 13:30 ITB AB102	ANTHROP 4M03 - C01 12:30 - 13:30 MDCL 1044
13:30	ANTHROP 4M03 - T05 13:30 - 14:30 MDCL 1044	COMP SCI 1TA3 - C01 13:30 - 14:30 ITB AB102			
14:30				BIOLOGY 2SI3 - C01 13:30 - 17:30 JHE 303	
15:30					
16:30					
17:30					
18:30					
19:30					
20:30					
21:30					

[View Exam Schedule](#)

Figure 26: New System Screenshot – Weekly Schedule



John Smith ▾

Home View Schedule Search Courses Enroll/Drop Support ↗

1. Search for Courses 2. Search Results 3. Enroll / Drop

Search for Courses

1 Select Subject:
BIOLOGY

2 Course Level
1 OR Course Code
Select Course Code...

Back to Home Search

Figure 27: New System Screenshot – Search Criteria Page

McMaster
University 

John Smith ▾

Home View Schedule Search Courses Enroll/Drop Support ↗

1. Search for Courses 2. Search Results 3. Enroll / Drop

Search Results

Course Info	Times	Monday	Tuesday	Wednesday	Thursday	Friday	Enr.	Action
BIOLOGY 1BB3 Argumentation <i>Matthew Grellette</i>	Lecture 1 ▾ [] []		15:30 - 16:30	15:30 - 16:30		15:30 - 16:30	30/100	Add to Wishlist
BIOLOGY 1A03 Cellular and Mole... <i>Alastair Tracy</i>	Lecture 1 ▾ [] Lab 15 ▾			8:30 - 9:30	8:30 - 9:30			16/100

[Back to Search](#) [Continue to Enroll](#)

Figure 28: New System Screenshot – Search Results Page


John Smith

[Home](#) [View Schedule](#) [Search Courses](#) [Enroll/Drop](#) [Support ↗](#)

1. Search for Courses 2. Search Results 3. Enroll / Drop

Wishlist

Course Info	Times	Monday	Tuesday	Wednesday	Thursday	Friday	Enr.	Action
ANTHROP 1AB3	Lecture 1				19:00 - 22:00		38/100	Remove
Introduction to Ant...	Tutorial 1			9:30 - 10:30				Enroll
<i>Karen McGarry</i>								
BIOLOGY 1A03	Lecture 1				8:30 - 9:30	8:30 - 9:30	16/100	Remove
Cellular and Molecu...								Enroll
<i>Alastair Tracy</i>	Lab 1		8:30 - 10:30					

Enrolled Courses

Course Info	Times	Monday	Tuesday	Wednesday	Thursday	Friday	Enr.	Action
COMP SCI 1TA3	Lecture 1	12:30 - 13:30	13:30 - 14:30		12:30 - 13:30		24/100	Save Changes
Elementary Comp...	Tutorial 2	11:30 - 12:30						Drop
<i>TBD</i>								
ANTHROP 4M03	Lecture 1			12:30 - 13:30		12:30 - 13:30	24/100	Save Changes
History of Anthro...	Tutorial 19	9:30 - 10:30						Drop
<i>Sean Corner</i>								
BIOLOGY 2SI3	Lecture 1				13:30 - 17:30		13/50	Save Changes
Studio Investigati...								Drop
<i>Christopher Myhr</i>								

[Back to Home](#)

Figure 29: New System Screenshot – Enroll from Wishlist Page