

eHealth 703
Virtual Care & Telemedicine for eHealth
Spring/Summer 2022
Course Outline

CALENDAR/COURSE DESCRIPTION

An interdisciplinary course on the engineering, health science, and business components of telemedicine. Structured around the three themes of telemedicine infrastructure, wearable sensors and technology in the community, this course will enable learners to understand the current telemedicine landscape, in addition to understanding the scope and possibilities of distributed healthcare. Themes are presented in cross-discipline modules through lectures by industry experts, case studies and applications from current literature. Students are supported through a series of exercises to provide hands-on experience with acquiring and processing health data and for a final project where small teams will present prototype solutions to address current issues in telemedicine.

PRE-REQUISITES AND ANTI-REQUISITES

Prerequisite(s): Basic familiarity with a programming language (object-oriented) and relational databases or algorithms and data structures which are described as the pre-conditions for the eHealth program admission are prerequisites for this course.

INSTRUCTOR CONTACT INFORMATION & LOCATION

Instructor: Alex Drossos
drossos@mcmaster.ca
Virtual Office / HSC 4N-79

Virtual Office Hours
By appointment only please
By phone/Zoom/MS Teams

TA: Carley Ouellette
ouellc1@mcmaster.ca

COURSE STRUCTURE

LECTURES: Online Asynchronous Content on Avenue to Learn (A2L) (<http://avenue.mcmaster.ca>).

SEMINARS: Online **Live** sessions using Zoom (see Course Schedule) – **Mandatory Attendance**

LABS: **Live** sessions In Person (see Course Schedule) – **Mandatory Attendance**

FINAL PROJECT PRESENTATIONS: **Live** class In Person (see Course Schedule) – **Mandatory Attendance**

| Period | Theme | Activities |
|-----------------------|---|--|
| Section A: Weeks 1-4 | Virtual Care Infrastructure | <ul style="list-style-type: none"> 3 modules (asynchronous) Lab 1 (class during week 2) |
| Section B: Weeks 5-8 | Telemedicine for a New Generation & Aging Society | <ul style="list-style-type: none"> 3 modules (asynchronous) Lab 2 (class during week 6) |
| Section C: Weeks 9-12 | Wearable Technologies & Advanced Topics in VC | <ul style="list-style-type: none"> 3 modules (asynchronous) Lab 3 (class during week 12) |

COURSE OBJECTIVES

By the end of this course, students should be able to:

- Identify the health, engineering and business aspects involved in the implementation of virtual care and telemedicine services,
- Explore the telemedicine landscape and practices in Canada and abroad,
- Discuss the innovations, benefits and challenges in the field of virtual care and telemedicine,
- Apply methods of data acquisition and processing of health data, and
- Create a prototype to address current issues in virtual care and telemedicine.

INSTRUCTIONAL METHODS

This is a blended course run primarily online with some in-class sessions. It has both self-directed and instructor-guided mentorship. It will be presented in a flipped classroom format, whereby you watch lecture content in online modules, conduct research independently and then engage in the concepts in online group seminars and in-class labs, which are meant to simulate “real life” experiential exercises.

The course and all evaluations are segmented into three themes, each designated as a Section. Each Section lasts approximately 4 weeks, consisting of three online modules and 1 lab. You are welcome to work ahead within each of the three Sections in the online modules if you find you have more time one week and are busy the next. All of the modules for a given Section are open from the beginning of that Section, typically about 1 week before it is set to formally “begin” according to the schedule, with the exception of Section A which is simply available at the beginning of the course. In spite of the open/flexible schedule for completing the modules, you are still expected to meet all deadlines and attend all online seminars, whether you are presenting or acting as a participant. You must also complete labs and all other assignments/evaluations per the Course Schedule.

A detailed course schedule with all specific dates is also provided. It is the student’s responsibility to be aware of the Course Schedule and any information on the course websites (e.g. A2L) and to regularly check course announcements and news.

MATERIALS

Required Texts:

All course content, materials and resources are on Avenue to Learn and available through the online McMaster Library content.

Online Platforms:

Avenue to Learn (or A2L) and Zoom will be the main platforms used during this course, though others may at times also be used. These will complement the in person components.

ASSESSMENT

The course offers a balance of individual and group evaluation methods:

| Component | Weight |
|---|--------|
| Research Brief (individual) | 15% |
| Labs (rotating pairs) [3 x10%] | 30% |
| Online Seminar: Presenting & Participating (individual) | 15% |
| Final Project (group) [presentation 20% + paper 20%] | 40% |
| Total | 100% |

Research Brief

The research brief is worth 15% of your grade and is to be completed individually.

Your brief should provide an overview of selected literature and the current landscape of an area within one of the course Section's themes, with a specified focus as chosen by you the student. You are encouraged to select a sub-topic in the domain of eHealth related to your own research interests or work experience. Reports are expected to be written as scholarly review manuscripts that are publication quality and are limited to 4 pages in length including tables/figures (space for references however can be in addition to this 4-page max). Detailed instructions and a sample template will be provided on Avenue to Learn.

Labs

The three (3) Labs, or simulated experiential components, are worth a total of 30% of your grade and will be completed in pairs (with possibly one group of 3, if there is an odd number of students). Labs will be held in person, according to the Course Schedule. Each of the Labs will follow the following format:

- (1) Preparation—understanding the objectives, gathering the required supplies and/or equipment, reading technical documentation.
- (2) Lesson Exercises—short activities that will provide some skills or tools regarding the specific topic.
- (3) Practical Exercise—demonstrate understanding of the above by creating a small outcome or output based on a real-world scenario using the above skills.

Each individual is expected to be able to demonstrate their use of the tools, provide the required outcome/output and answer any questions regarding the process of acquiring this output by the end of each Lab.

Attendance and completion of all 3 Labs is Mandatory to complete this course.

Your instructor must be notified in advance if you cannot attend a Lab for a legitimate reason. Missing a Lab will require a make-up assignment at the discretion of the instructor.

Online Seminars: Presenting & Participating

The online seminars and associated discussions are worth 15% of your grade and will be completed individually. Approximately 10% is for your individual Seminar presentation and approximately 5% total across the entire course for your participation in each other student's Seminar discussion (both synchronous while "live" and asynchronous afterwards), according to the rubric posted on Avenue to Learn.

Once during the term, each student will lead a seminar and discussion on a primary research journal publication or popular news article related to the course themes. The seminar schedule will be determined by the instructor early in the term. The instructor will also assign the articles, at random, to each of the students. The topics will be broad but focused on two key areas: Innovations in Virtual Care (especially during the COVID-19 pandemic) and International Perspectives on Virtual Care.

Presentations will resemble conference-style proceedings summarizing the main contributions of the article with a length of 10-15 minutes. This will be followed by leading a 5-minute “live” discussion period with classmates. Presenters are expected to come prepared with prompts for topics for discussion related to their material. All students are expected to have read the article in advance and to actively participate in the discussion. Following the “live” portion of the discussion, ongoing asynchronous discussion may continue in the online platform.

Seminar presentation and participation marks will be based on the quality of your contributions. **Mere attendance is insufficient.** Your participation will be evaluated based on both the “live” discussion and the asynchronous discussion that follows.

Attendance and participation in all Seminars (whether presenting or not) is Mandatory to complete this course.

Your instructor must be notified in advance if you cannot attend a Seminar for a legitimate reason. Missing a Seminar will require a make-up assignment at the discretion of the instructor.

Final Project

The final project is worth 40% of your grade and will be marked as a group. The report and presentation will be equally weighted at 20% of your final grade. Groups will select a topic based on one of the themes threaded throughout the course. Based on their topic, each group will conduct a review of the current healthcare landscape and identify gaps in the field that can be advanced through Virtual Care or Telemedicine. Groups will propose and create a prototype of a telemedicine technology or service that can be applied to meet their identified need.

In completing this project, students are expected to make effective use of all relevant resources both in and outside of the course material. In the creation of a virtual care prototype, students are expected to apply the hands-on skills developed throughout the various course components.

During the final week of the course, groups will prepare a written report and present their prototypes and telemedicine solutions during a mandatory “live” session which will be in person. Both the presentation and written report will outline the current landscape, identified need and overview of proposed solution and prototype. The written report is limited to 10 pages plus tables and figures, and any additional space necessary for references. The presentations will be approximately 30 minutes in length and will be followed by a 10-15-minute question period. Further details can be found on Avenue to Learn.

It is mandatory for students to attend and participate in all class final presentations.

SCHEDULE AT A GLANCE (TENTATIVE)

The following is a tentative schedule of main events and deadlines for the course. Changes or updates to the items below will be reflected only in A2L so students should regularly refer to the schedule there.

| Activity | Date | Notes |
|-----------------------------------|--|---|
| Course Starts | Wednesday May 4, 2022 | Asynchronous content on A2L will be available as of this date |
| Course Intro, "live" class | Wednesday May 4, 2022 2:30-3:30pm | Zoom |
| Lab 1 | Wednesday May 11, 2022 2:30-5:00pm | In Person, MDCL-2233 |
| Final Project Group Contracts Due | Monday May 30, 2022 by 11:59pm | Written Assignment Due Date |
| Lab 2 | Wednesday June 8, 2022 2:30-5:00pm | In Person, MDCL-2233 |
| Research Brief | Monday June 13, 2022 by 11:59pm | Written Assignment Due Date |
| Seminars — Day 1 | Wednesday June 22, 2022 | Zoom |
| Seminars — Day 2 | Wednesday July 6, 2022 | Zoom |
| Seminars — Day 3 (if needed) | Wednesday July 13, 2022 | Zoom |
| Lab 3 | Wednesday July 20, 2022 2:30-5:00pm | In Person, MDCL-2233 |
| Final Project Presentations | Wednesday July 27, 2022 2:30-5:00pm | In Person, MDCL-2233 |
| Final Project Paper | Monday August 8, 2022 by 11:59pm | Written Assignment Due Date |

GRADE CONVERSION

At the end of the course your overall grades will be converted to a letter grade using the following conversion scheme.

| LETTER GRADE | PERCENT | POINTS |
|--------------|---------|--------|
| A+ | 90-100 | 12 |
| A | 85-89 | 11 |
| A- | 80-84 | 10 |
| B+ | 77-79 | 9 |
| B | 73-76 | 8 |
| B- | 70-72 | 7 |
| F | 00-49 | 0 |

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at

<http://www.mcmaster.ca/academicintegrity>

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations.

COMMUNICATION

Students who wish to correspond with instructors directly via email must send messages that originate from their official McMaster University email account. This protects the confidentiality and sensitivity of information as well as confirms the identity of the student. Emails regarding course issues should NOT be sent to the Administrative Assistant.

ACADEMIC ACCOMMODATIONS

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contact by phone at 905.525.9140 ext. 28652 or e-mail at sas@mcmaster.ca. For further information, consult McMaster University's Policy for [Academic Accommodation of Students with Disabilities](#).

NOTICE REGARDING POSSIBLE COURSE MODIFICATION

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

TURNITIN.COM STATEMENT

In this course we will be using a web-based service (Turnitin.com) to reveal plagiarism. Students will be expected to submit their work electronically to Turnitin.com and in hard copy so that it can be checked for academic dishonesty. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to <http://www.mcmaster.ca/academicintegrity/>.

ON-LINE STATEMENT FOR COURSES REQUIRING ONLINE ACCESS OR WORK

In this course, we will be using Avenue to Learn, MS Teams and email. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, usernames for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.