

# EXSU 620 Surgical Innovation I

**AUTUMN 2017**

Presented by:



### COURSE OBJECTIVES

Experimental Surgery: The process of surgical innovation and acquisition of hands-on skills necessary to work within a multi-disciplinary team in the creation of a novel, need driven, and marketable prototype used in the care of the surgical patient. This is the first of a 2-part course introducing concepts and performing needs analyses.

The work in this course is carried out in multi-disciplinary teams and the active participation and contribution of each team member is critical to your success. Each team will be assigned three academic supervisors – one each in the medical, engineering and business areas to guide and assist the teams. In addition, each team will be assigned a non-academic mentor in the winter term.

### REQUIRED TEXTBOOK

**Book**

Yock P.; Zenios, S.; Makower, J.; (eds). **Biodesign: The Process of Innovating New Medical Technologies**, 2nd edition (Cambridge University Press 2015)

**Availability :**

2nd edition : Concordia Webster Library, 1 day reserve (call number R 856 B458 2015)

: ÉTS Bibliotech Library, 28 days (call number R 856 B458 2015)

1st edition : McGill Osler Library

Physical book : 3 hour reserve (call number QT 36 B1463 2010)

eBook also available at Osler

**Internet content**

<http://ebiodesign.org/> The companion website to the 2nd edition of Biodesign: The Process of Innovating Medical Technologies, provides readers with supplemental content to the textbook. You can find useful videos and other support materials to help in the process of innovating new medical technologies.

<https://web.stanford.edu/group/biodesign/cgi-bin/bmesource/> A web portal for the biomedical technology design community. The site contains links to basic information that may be helpful in the technology transfer process.

### EVALUATION PROCEDURE

Students will be expected to be prepared for class and to participate in all class discussions. Your final grade will be comprised of:

|  |  |  |
| --- | --- | --- |
| Item | Due date | Weight |
| Attendance and participation – fall 🡪 5%  Peer evaluation (multiplicative) 🡪10% |  | 15% |
| Individual paper | September 27 | 10% |
| Innovation journal (one per team) | December 13 | 10% |
| Initial needs presentation 🡪10%  Written group report (5 needs)🡪 15% | November 1 | 25% |
| Initial concept pitch | December 13 | 40% |
| Fall total |  | **100%** |

### GRADING CORRESPONDENCE

|  |  |  |
| --- | --- | --- |
| **Letter Grade** | **Numerical equivalent (Concordia & ETS)** | **Numerical equivalent (McGill)** |
| A+ | 90% and above |  |
| A | 85% - 89% | 85% - 100% |
| A- | 80% - 84% | 80% - 84% |
| B+ | 75% – 79% | 75% – 79% |
| B | 70% - 74% | 70% - 74% |
| B- | 65% - 69% | 65% - 69% |
| C | 60% - 64% | 60% - 64% |

### ACADEMIC INTEGRITY

All students participating in the Surgical Innovation Project are expected to be honest in all of their academic endeavours and relationships with all three Universities. As this project involves visits to hospitals, students are expected to respect the privacy rights of the patients and to behave in a courteous, respectful and professional manner at all times.

### DISCLAIMER

The faculty reserve the right to change or update this outline, and any other course related materials, at any time. The student will be informed in a timely manner through emails and/or announcements during class. Please ensure that your email address is correct.

### DELIVERABLES & EVALUATION

Individual Write Up – 10% - (due September 27, in class)

Three components:

1. Needs observations notebook
   1. Create an innovation notebook and take detailed and copious notes regarding what you have observed. Do not filter or editorialize when recording your observations. Record the date, time, and place of all observations; specific facts, numbers, details of what happens at the site; sensory impressions; personal responses to the fact of recording field notes; specific words, phrases, and insider language; summaries of specific conversations; and questions about people or behaviors at the site for future investigation.[[1]](#footnote-1)
   2. Can be handwritten, bullet form, diagrams – this is your personal log of what you have seen and thought about, ideas etc.
2. **Graded:** 5 page maximum (recommend 3) -- Reflection based on personal needs observations notebook
   1. What have you learned so far?
   2. What areas are you interested in?
   3. General needs/ideas you have identified (max 5)
3. Take the personality test at: <https://www.16personalities.com/free-personality-test> and indicate your personality type (note, this will only be used to help organize the teams) at the end of your document.

Team Meeting logbook – 10% (team) – due at the end of the semester

This journal (written paper) is a tool to track team participation and to ensure that all members of the team are aware of their commitment to the team’s goals. The log-book will also help the team members organize tasks, follow up on activities and organize team ideas.

Log entries should include:

* History of each group meeting
  + Date, Length, Names of the attendees
* The meeting:
  + Brief summary of discussion
  + Tasks to be done (list), by whom and due date
  + Date and time of next meeting

Note: this document can be completed in bullet form. There are many log-book templates available online.

The journal will start from the date the team composition is announced and continue until the end of the semester. It may be reviewed at any time prior to the end of the semester by one of the team supervisors.

Initial Needs presentation – 25%

**Part 1 : 15% Written report - 15 page maximum - 1 report per group**

After having combined, listed and defined all your needs/observations, your team will choose 5 statements that will have to be detailed and explored under different perspectives[[2]](#footnote-2) such as disease fundamentals, existing solutions, market and stakeholder analysis overview in order to specify unique criteria that your future solution will need to encounter.

Therefore, you will present your 5 cases equally - make sure to define the most important factors that will be used to each selection process.

The report should contain (at least):

1. Presentation page, glossary and introduction
2. Overview of all needs identified (the universe from which you chose 5)
3. Criteria used to identify the 5 most promising needs
4. For each of the 5 most promising needs:
   * Provide the need statement
   * Describe the problem
   * The market (in general terms – ie. Is it likely that finding a solution will be worth the effort?)
   * Need criteria (solution must have, nice if solution has)
5. Conclusion
6. Appendices : The list of all your other observed needs + your filtering process and other references if necessary

**Part 2: 10% Oral presentation**

* 20 minutes presentation plus question period
* Presentation of the 5 needs identified by the team
* Attendance at the presentation is mandatory for all team members
* Presentation should be supported by slides (PPT, Prezi ….)

 Initial concept pitch - 40%

Presentation of the need you have decided to focus on for the winter semester and the goal of your presentation is to convince the audience that your identified need and proposed solution has the potential to be successful. We are not expecting a complete solution, market assessment and prototype - rather a clear plan of what the team will be working on in the winter. The objective of the presentation is to convince a busy professional to take the time to mentor your team for the winter semester.

The presentation should be no more than 20 minutes plus question period. You can support your case with slides and brief handouts (max 6 pages).

* The presentation should answer the following:
  + Why this need?
  + What are the potential solutions your team are considering?
  + Can your team deliver the solution?
  + Why should a mentor invest time in your team/solution?

### SYLLABUS

This outline lists the topics covered during the course and any required readings.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Fall 2017** | | | | |  |
| Session | Date/time | Location | Topic | Deliverable | Reading |
| 1 | Sept 6  From 1PM to 4PM | Espace 3C – ÉTS Library | Orientation |  |  |
|  | 5@7 | Musée Dow - INGO | 5@7 – WINE AND CHEESE |  |  |
| 2 | Sept 13 | McGill **[[3]](#footnote-3)** | Introduction to Hospital and medical device industry  History of surgical innovation  Identifying needs |  | 1.1; 1.2 2.1, 2.2 |
| 3 | Sept 20 | McGill | Need statement development |  | 1.3 |
| 4 | Sept 27 | McGill | Needs screening process  The art of pitching |  | 2.1 to 2.4 |
| 5 | Oct 4 | McGill | The regulatory environment 1  Speaker: PegaMEdical | ANNOUNCING THE TEAMS | 4.2 and 5.4 |
| 6 | Oct 11 | McGill | Serial entrepreneur stories : by Steve Arless |  |  |
| 7 | Oct 18 | McGill | The regulatory environment 2   * Speaker: PegaMedical (to be confirmed) |  |  |
| 8 | Oct 25 | McGill | Presentation preparation time |  |  |
| 9 | Nov 1 |  | TEAM PRESENTATIONS | **Initial needs presentation** | |
| 10 -11 | Nov 11  **SATURDAY** | Concordia | Brainstorming and design thinking   * Ron Ferguson |  | 3.1 and 3.2 |
| 12 | Nov 15 |  | Prototyping and open source tools   * Vincent Duchaine & Lorne Beckman |  |  |
| 13 | Nov 22 |  | Concept screening & prototyping 2  - Vincent Duchaine & Lorne Beckman |  | 4.1 to 4.6 |
| 14 | Nov 29 | DISTRICT 3 (Concordia) | Customer discovery   * By Edna Chosak |  |  |
| 15 | Dec 6 |  | Presentation preparation time |  |  |
| 16 | Dec 13 |  | INITIAL CONCEPT PITCH | **Initial concept presentation** | |

1. http://ebiodesign.org/chapter/1-2-needs-exploration/ [↑](#footnote-ref-1)
2. Please refer to <http://ebiodesign.org/wp-content/uploads/2014/04/Appendix-2.5.2.pdf> and <http://ebiodesign.org/wp-content/uploads/2014/04/Appendix-2.5.1.pdf> - for examples of needs specifications [↑](#footnote-ref-2)
3. McGill 🡪 Montreal General Hospital, Level B3, Room 126.

   [↑](#footnote-ref-3)