

Polytechnique Montréal
CAP7003E - Doctoral research strategies in engineering, Group 02
1 credit, Fall 2018

Syllabus

Instructor: Naser Ezzati-Jivan
Office: M-3423
n.ezzati@polymtl.ca

Coordinator: Élise Saint-Jacques
Office: C-330.1
elise.saint-jacques@polymtl.ca

1. Objectives

The primary objective of this workshop is to clarify what is a successful doctorate at Polytechnique and to bring doctoral candidates to articulate the success criteria. More specifically, at the end of the workshop, the doctoral candidates will be able to:

- describe the characteristics of a quality doctorate and the skills that need to be acquired;
- identify the success factors associated to each key milestone of the doctoral journey;
- map and efficiently mobilize human and material resources;
- articulate in writing the expected deliverables to fulfill the requirements from the institution and the thesis advisor as well as to satisfy one's personal and professional ambitions;
- discuss in a constructive manner within an interdisciplinary framework.

2. Workshop format and pedagogical approach

The 4-session work is meant to be highly interactive. Each session will exploit a three-stage approach:

- Prior to the session, doctoral students are invited to formulate their individual understanding with respect to the theme to be covered; a questionnaire or readings help them in their thinking and reflection
- At the beginning of the session, discussions in small groups allow everyone to present his own understanding to enhance or confront it by debating with the other doctoral students.
- Doctoral students and seasoned researchers (professors, Ph.D. graduates) clarify their understanding of the concepts, processes and corresponding expectations. Exchanges and supported and structured by the construction of a collective heuristic schema (conceptual map).

3. Schedule (please visit the MOODLE page for updates and announcements)

- 1st session: Tuesday, **September 18th 2018**, 12:45 to 16:15, Room: C-539.6
- 2nd session: Tuesday, **October 2nd 2018**, 12:45 to 16:15, Room: C-539.6
- 3rd session: Tuesday, **October 16th 2018**, 12:45 to 16:15, Room: C-539.6
- 4th session: Tuesday, **October 30th 2018**, 12:45 to 16:15, Room: C-539.6

4. Assignments and grading

Grading is on a pass/fail basis. The presence and full participation in all four sessions are required to obtain credit. Under exceptional circumstances, students might be allowed by the instructor to miss one class or one assignment, but students missing more than one event, class or assignment, will have to abandon the course.

Assignments: all assignments are mandatory and should be dropped on the Moodle site of CAP7003E-Group02.

- Assignment 1: *A successful doctorate at Polytechnique: What are we talking about*, Due date: Monday, **September 17th** at 12:00 (noon).
- Assignment 2: *Doctoral journey, milestones, and expectations*, Due date: Monday, **October 1st**, at 12:00 (noon).
- Assignment 3: Research proposal
 - o Part I - *Writing the first version of your proposal*, Due date: Monday, **October 15th** at 12:00 (noon);
 - o Part II - *Critical analysis of 3 research proposals*, Due date: Monday, **October 29th** at 12:00 (noon);
 - o Part III - *Preparing and submitting the revised version of your proposal*, Due date: Monday, **November 12th** at 12:00 (noon).

5. Detailed work plan

Session 1 – A successful doctorate at Polytechnique: What are we talking about?

Characteristics of a quality doctorate. Evaluating the originality of a contribution. Difference between a research theme and a research project. Risks and pitfalls.

Session 2 – Doctoral journey, milestones, and expectations

Milestones of the doctoral journey. The comprehensive exam – rationale, typical formats, preparation. The nature of scientific writing. The thesis – content and format. The defense.

Session 3 – Leading a research project

Major steps in carrying out a research project: emergence and definition, planning and organization, execution, monitoring and completion. Management of risks, time, and priorities when carrying an original research project with uncertain outcomes.

Session 4 – Deliverables and strategy for success during and after the doctoral program

Requirements from the institution. Expectations from the thesis advisor. Personal goals. Strategies for completing the Ph.D. successfully. Strategies for a fulfilling career.