

UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE AND ENGINEERING
ELITE Master's Program

APS1031H1F2019 Infrastructure Planning

Course Outline

Introduction

This course is a practical guide to building an Infrastructure Development Plan (IDP). We work from first principles so that what you learn can be applied to any jurisdiction in the world. Our focus is the first part of the IDP, which involves translating the vision of future capability and economy into infrastructure development requirements and strategy.

Infrastructure enables economic and social development; it enables the health of the population. It defines the world we live in and creates the world that our children will inherit. It is more than what we build, and includes what we harness of the natural world and how we decide to use it. It is necessarily multidisciplinary and is the essence of what engineering was at its very inception. However, this also means that it cannot be neatly contained in any one discipline or specialisation. In the truest meaning of the phrase, it is engineering in society.

This is not a procedural course. You will be taught the foundational concepts and principles of infrastructure planning and set a real IDP project for a real client over the semester. The projects have been selected to develop your understanding of producing each aspect of IDP Part 1 – the Development Strategy. We will explore capability-based planning, risk evaluation, futuring, the vitae system of systems, the role of infrastructure and the concept of through-life value. We will also look at financing and contracting options with a focus on risk allocation. You will decide the pace and balance of the course.

This course is especially useful for those considering a career in infrastructure development, policy, international development, infrastructure project finance and planning.

Course Designation

APS1031 Infrastructure Planning, starts 9 September 2019. The course will run on Mondays from 13:00 to 16:00 in MY315. It is a foundation course of the CRCI;
<http://www.crci.utoronto.ca/education/academic/infrastructure-courses>.

Contact:

Prof. Alec Hay will be available by appointment throughout the semester. Contact should be made by email.

Evaluation

One project, representing 60% of the total course marks. This is a practical survey and research project that requires a first principles approach and critical assessment of the available information. Marks will be awarded separately for the project report (60%), decision brief (20%) and presentation (20%).

There will be an individual multiple choice examination, mid-term, of 30 questions. This represents 15% of the total course marks. The examination will be closed book.

There is also a two-hour oral examination comprising 3 assigned questions to each project team. Each project syndicate will be given a question that they will have 20 minutes to prepare an answer, which will be presented and justified before the whole class. Each will be critiqued by the instructing staff. This is repeated until each syndicate has answered all three questions. This form of examination reflects the actual concept development process in practice and assesses the ability of each syndicate member to grasp the core principles and concepts and apply them to a given challenge. With the benefit of immediate feedback and learning from other syndicate presentations, this examination process is also very much part of the learning process. The oral exam represents 25% of the total course marks. The examination will be closed book.

Materials

There is **one** required text for this course “Sustainable Infrastructure: Principles into Practice” by C Ainger & R Fenner. This contains a lot of valuable information that you will likely wish to refer back to over your careers, if you have anything to do with infrastructure in the future. I recommend that you borrow/rent “Doing it Differently” by D Blockley and P Godfrey and “GRASP” by JJ McLaughlin, M Ocock, A Oldfield & B Trebes. These are all available at very competitive prices and buy-back options through the UofT Bookstore. There are other useful readings that will be referenced during the course on Quercus. You may also be interested in “Designing Healthy Cities” by J Aicher, “Rethinking Masterplanning: Creating Quality Places” by H Al-Waer & B ILLsley, and “Financing Infrastructure Projects” by T Merna & FF Al-Thani.

Address course questions and (correspondence) course work submissions to me at alec.hay@utoronto.ca