

APS 420 H1S | APS 1420 H1S – Winter 2019
Technology, Engineering and Global Development
Instructor: Ahmed Mahmoud, P.Eng
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Course Overview:

One of the most remarkable recent trends in the profession of engineering has been the rising interest in the role of technology in addressing the perverse challenge of global poverty. This trend emerged from students – such as yourself – asking their educators and institutions how they can capitalize on their skills in order to effect a positive change in the lives of those who lack access to the basic necessities of life, such as adequate nutrition, clean water, and safe shelter. In the past several decades, dozens of complex innovations such as fortified food staples and mobile finance – along with simpler ones, such as all-terrain wheelchairs made from recycled bicycle components – have been brought to market and have already helped lift millions out of poverty. However, as we will come to learn in this course, technology alone will not rid the world of its intractable problems, and in fact, it may do more harm than good if not implemented appropriately.

Course Motivation:

Every failed attempt to leverage technology to help the poor serves to arouse the skepticism of those at the receiving end of the technology, and it discourages donors from investing in further initiatives. We owe it our profession, to our donors/investors, and to our customers in the Global South, to understand how we can learn from past failures and how we can do an effective job of addressing key challenges in global development with clever innovations (which need not be costly nor cutting-edge).

How We Will Accomplish That:

Through a combination of lectures, guest talks, readings, and case studies, we will learn about the history and competing theories of international development, globalization, and foreign aid; major government, non-government, and multilateral actors in development; emerging models of development (social entrepreneurship, microfinance, risk capital approaches); classic diffusion of technology models that derive from anthropology, sociology, psychology, geography and migration studies; and the economic history that trace barriers to the use of innovations. This course will specifically focus on the impact on innovation as it applies to rural agricultural development, humanitarian engineering, and WASH.

Desired Outcomes:

- Shed any incorrect, preconceived notions about poverty and aid economics
- Gain a broad understanding of some key concepts in global development which would allow you to participate in contemporary discourse about development and contribute to ongoing discussions about technology, its role in development, as well as its limitations
- Think critically and creatively about development interventions and aid projects
- Learn about appropriate technologies for developing communities, their impact, and how they can be conceived, designed and implemented

Intended Audience:

This course is primarily targeted toward senior engineering undergraduates and graduate students in the Faculty of Applied Science and Engineering. However, it is open – and may be of interest – to graduate students from the Munk School of Global Affairs, the Rotman School of Management, and select departments in Arts and Science.

Meeting Schedule:

Class will meet twice a week:

Wednesday	3 pm – 5 pm	SS 2108 (Sidney Smith)
Friday	3 pm – 5 pm	OI 2214* (OISE)

TAs:

Nitish Sarker	nitish.sarker@mail.utoronto.ca
Rachel Pagdin	r.pagdin@mail.utoronto.ca

Office Hours:

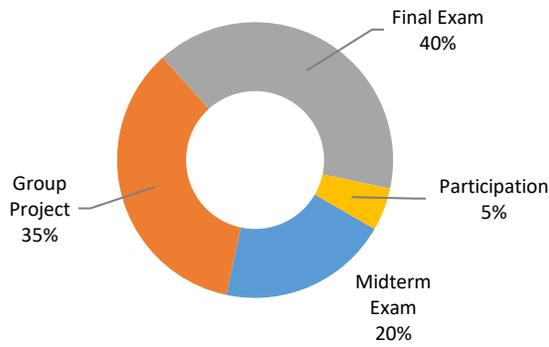
Monday	1 pm – 2:30 pm	MY791 – Myhal Centre
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However, feel free to email the instructor if you would like to meet outside those hours.

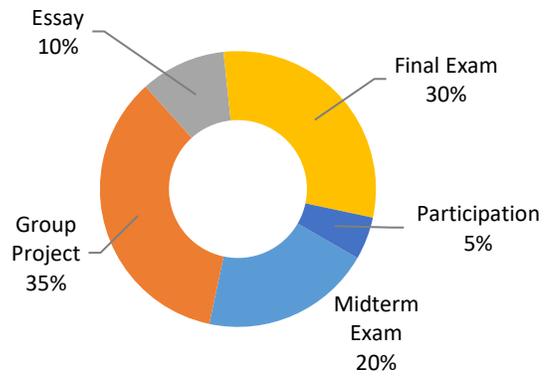
Course Materials:

There is no official course textbook. All readings (required and optional) will be made available on Quercus.

Grading Scheme:



APS 420



APS 1420

* Except **February 15** and **April 5**; on those days we will meet in **OI 5150 (OISE)**

Lecture Schedule:

Week #	Dates	Lecture 1 (Wednesday)	Lecture 2 (Friday)	Assigned Readings
1	January 9 January 11	Introduction to the course and get-to-know-you	Term project overview and teambuilding exercise	<ul style="list-style-type: none"> Brief: World Vision Social Innovation Challenge: How might we find value in waste?
2	January 16 January 18	<ul style="list-style-type: none"> Brief history of international development, globalization, and foreign aid in the 20th century Competing paradigms for development 	Mathu Jeyaloganathan Portfolio Manager, Impact Investing, World Vision Canada	<ul style="list-style-type: none"> Excerpt: William Easterly, The White Man's Burden Excerpt: Jeffrey Sachs, The End of Poverty
3	January 23 January 25	<ul style="list-style-type: none"> Understanding and measuring poverty Poverty traps 	Lisa Erdle PhD Student Microplastics pollution in the Great Lakes	<ul style="list-style-type: none"> Excerpt: Amartya Sen, Development as Freedom
4	January 30 February 1	<ul style="list-style-type: none"> From supply-driven projects to human-centered design (HCD) Introduction to Appropriate Technology and its role in rural development Frugal innovation 	Business Model Canvas workshop	<ul style="list-style-type: none"> Excerpt: E.F. Schumacher, Small is Beautiful

5	February 6 February 8	CLASS CANCELED	<ul style="list-style-type: none"> • Introduction to delivery models for the Bottom of the Pyramid • Business Models and Value Chains • Emerging models of development and social entrepreneurship 	<ul style="list-style-type: none"> • Essay: Prahalad & Hart, The Fortune at the Bottom of the Pyramid
6	February 13 February 15	<p>Dr. Joseph Wong Ralph and Roz Halbert Professor of Innovation, Munk School of Global Affairs</p>	<ul style="list-style-type: none"> • Business models cont. • Emerging business models continued • Institutional framework for global development • Introduction to the UN MDGs and SDGs 	<ul style="list-style-type: none"> • Excerpt: [ILO] A Rough Guide to Value Chain Development • Paper: How the Millennium Development Goals are Unfair to Africa
7	Reading Week			
8	February 27 March 1	<p>Tackling financial exclusion in low-income countries. Topics covered:</p> <ul style="list-style-type: none"> • Microfinance • Fintech innovations 	Case Studies in technologies for agricultural development	<ul style="list-style-type: none"> • Report: A Practitioner's Guide for Technology Evaluation in Global Development

9	March 6 March 8	Midterm	Kiki Chan PhD, Food Engineering	<ul style="list-style-type: none"> Excerpt: Calestous Juma, The New Harvest
10	March 13 March 15	<ul style="list-style-type: none"> Case studies in technologies for WASH in LICs 	Dr. Dan Hoornweg Professor and Research Chair, University of Ontario Institute of Technology	No Readings
11	March 20 March 22	<ul style="list-style-type: none"> Diffusion of technological innovations in the Global South 	Theory of Change workshop	<ul style="list-style-type: none"> Paper: Boru Douthwaite, Why Promising Technologies Fail: The Neglected Role of User Innovation During Adoption
12	March 27 March 29	With regards to development interventions: <ul style="list-style-type: none"> Impact assessment Monitoring and Evaluation 	<ul style="list-style-type: none"> Pitching workshop Reflections and Q&A 	<ul style="list-style-type: none"> Brief: Should the Randomistas Rule?
13	April 3 April 5	Pitch Presentations Part 1	Pitch Presentations Part 2	No readings
14	April 10	Pitch Presentations Part 3	No class	No readings
	April 27	Final Exam – 2:00 pm in HA-401 (Haultain Building)		

Course Guidelines and Procedures

Missed Midterm Exam:

Per the Office of the Registrar's guidelines on missed term-work, students who have a valid reason for not attending the midterm must submit a [Term-Work Petition](#) on the [Engineering Portal](#). Note the following deadlines for submitting petitions concerning the midterm:

- Medical-related Absences: Petitions must be submitted no later than seven days after a student returns to school and before the end of the term. The Faculty will not accept term-work petitions submitted after the final examination period has ended.
- Non-medical Absences: Petitions must be submitted immediately after the date of the affected work, or as soon as the student is able to. For example, if a student plans to miss a quiz because of an unavoidable conflict, such as a citizenship oath ceremony or full-time job interview, they should file a petition in advance.
- Religious Observance Absences: Petitions must be submitted a minimum of three weeks in advance of the observance.

If the petition is approved by the Registrar, the test weight will be re-allocated to the final exam. If the midterm is missed and a petition is denied or is not submitted before the stipulated deadline, a grade of zero (0) will be assessed for the exam.

Late Arrival to Midterm/Final Exam:

If you arrive late to a test, two scenarios are possible:

- If you have no valid excuse for your late arrival (per the Registrar's guidelines for missed term-work), you may proceed to sit the remainder of the exam, but you will have to finish at the prescribed end time for the exam. If you choose not to sit the exam, you will be assessed a grade of zero (0).
- If you do have a valid excuse for being late, you can either sit the remainder of the exam, or you can choose to not sit the exam and submit a Term-Work/Final Exam Petition to the Registrar explaining your circumstances. However, you cannot do both; that is, you cannot continue to sit the exam and then hedge your bets by submitting a petition to the Registrar. You will have to decide, upon arrival, which option you prefer to proceed with.

Late Coursework:

Project deliverables, including presentation slides, are expected to be submitted by the specified due date and time. For each day the deliverable is late, 10% of the assigned grade will be deducted for up to five (5) days (i.e. a maximum deduction of 50%). No submissions will be accepted after five days from the due date/time, and a grade of zero (0) will be assessed to the assignment in question. Extensions will not be granted after the deadline has passed.

If the delay is the result of illness or domestic affliction, the individual involved must contact the instructor before the assignment is due to explain their circumstances. A medical certificate or other supporting evidence will be required to corroborate the individual's request for extension. The instructor will set a new deadline at their discretion which, if missed, will incur the aforementioned penalty of a 10% deduction per day. A lost or deleted computer file do not count as a valid excuse.

Re-grade Requests:

Re-grades are generally not done. The most common circumstance under which a re-grade request is granted is if there is a clear error or omission, such as a question being missed by the grader. If you believe there is an error with the grading of any of the course tests/assignments, submit the document in question to the TA that graded it with a full, written explanation for why you believe the mark is in error. The re-grade request must be submitted within five (5) working days of receiving the marked test/assignment. No exceptions will be made for late submissions.

TAs will review the test/assignment that has been submitted for a re-grade. Students acknowledge that, during the re-grading process, grades can increase, decrease, or remain the same. If there is further dispute about the grade, it must be submitted in writing within three (3) days of the re-grade to the instructor, who will examine the test/assignment and TAs comments. The same conditions about the grade apply.

Final Exams:

Final Exams are scheduled, administered and governed by the [policies](#) set by the Office of the Registrar. Should you find yourself unable to attend the final exam, you will have to submit a Final Exam Petition to the Registrar through the [Engineering Portal](#). Petitions that concern final examinations should be submitted within seven days of your last exam. Note that deferred exams and re-writes for courses in the Faculty of Applied Science and Engineering are not standard practice. If a petition is approved, the Committee on Examinations will likely assign an assessed mark based on closely supervised term work as compared to the closely supervised term work the rest of the class in relation to their final exam performance. Circumstances under which Final Exam petitions are approved are very rare, so be sure to carefully review the [Registrar's guidelines](#) before deciding on what course of action to pursue if you are considering missing the Final Exam.

Academic Misconduct:

Students should note that copying, plagiarizing, or other forms of academic misconduct will not be tolerated. Any student caught engaging in such activities will be subject to academic discipline ranging from a mark of zero (0) on the assignment or test to dismissal from the university as outlined in the academic handbook. Any student abetting or otherwise assisting in such misconduct will also be subject to academic penalties.