

Instructor: Professor Gerald Grant

Office: 920 Dunton Tower

Telephone: (613)520-2600 Ext. 8006

Fax: (613)520-4427

E-mail: gerald.grant@carleton.ca

Office Hours: Monday 11:00 a.m. – 12:30 p.m. or make an appointment by email (preferred)

Schedule: Monday November 6-Monday December 11, 2017 18:05-20:55 p.m.

Location: Canal Building 2202

Introduction:

A tidal wave of emerging information and communications technologies (ICTs) are fundamentally changing the way people and organizations interact with each other as well as engage in productive economic and social activity. Such technologies are often viewed in utopian terms with the expectation that they will drive individual, organizational, and societal prosperity and effectiveness. However, a deeper understanding of the affordances and limitations of these technologies is vital to effectively applying them for social and economic development. This is the core objective of this course. In developing this understanding we will examine a variety of emerging information and communication technology systems and applications, exploring their impact or potential impact for innovation, economic growth, and social progress.

Course Description:

Calendar description: Examines the emerging information technology trends and how new technologies can be incorporated to drive process innovation and improve operational performance.

Prerequisite(s): [ITIS 5401](#), or [ITIS 5403](#) for students in the International Development Management Concentration.

Learning Outcomes:

On completion of this course students are expected to have developed a deeper understanding of:

- ◆ A variety of emerging information technologies and their potential impact on organizations and society.
- ◆ How to assess the relevance and affordances of the new technologies and their appropriateness for use by individuals and organizations.
- ◆ How to communicate the value of the emerging technologies to various stakeholder groups.
- ◆ How emerging technologies may be applied to support innovation in delivering services to individuals, organizations, and society at large.

Course Material and Readings

There is no set textbook for this course but the following are recommended reading”

McAfee, A. and Brynjolfsson, E. (2017) Machine, Platform, Crowd: Harnessing our digital future, New York: W.W. Norton and Company ISBN 978-0-393-25429-7

Tapscott, D. and Tapscott, A. (2016) Blockchain Revolution: How the technology behind Bitcoin is changing money, business, and the world, Toronto, Penguin ISBN 978-0-670-06997-2

O’Reilly, T. (2017) WTF?: What’s the future and why it’s up to us, New York, HarperCollins.

Course material will come from assigned readings and supplementary readings provided by both the teacher and students.

Online resources:

Magazines:

[CIO](#), [CIO Insight](#), [Datamation](#), [Digital Trends](#), [Baseline](#), [Wired](#), [First Monday](#), [Fortune](#), [Information Week](#), [Business Week](#), [Forbes](#), etc.

Course Procedures and Grading:

The course will primarily be based around readings, discussions, and individual and group work. Students will be expected to actively participate in the discussions and all associated class activities. The final course grade will be derived as follows:

| | |
|--------------------------------------|-------------|
| Class participation | 20% |
| Group seminar leadership | 20% |
| Individual article summaries | 20% |
| Individual Emerging Technology Essay | 40% |
| Total | 100% |

Class Participation:

Participation by students in class discussion and activities is an important part of this course. Effective participation is possible only by regular class attendance, active pre-class preparation, and online contributions as required. You should read the required readings before coming to class. You will not gain participation marks simply by asking an obligatory question or two. Nor will such marks be based on the number of questions or comments made. Participation grades will reflect the total impact the student has had on the class over the term, through significant and insightful comments, and a demonstration of good problem-solving and analytical skills.

Group Seminar Leadership

As part of the classroom learning experience students will work in groups of two or three to lead one of the seminars. In leading the seminars students will

- review the papers assigned for that day
- synthesize the most relevant theoretical and practical issues raised in the articles
- supplement the articles with any other relevant material (videos, case vignettes, etc.)
- develop a PowerPoint presentation of the seminar.
- Discuss the presentation with the professor at least 2 days before the class presentation.
- lead the class through the seminar. The expectation is that seminar leaders will develop ways to engage the class in an interactive dialog. It should not be a one-way presentation.
- submit the PowerPoint presentation via CUlearn before the start of class.

Individual Paper Summaries and Analyses

Over the course of the term each student will be required to submit 2 individual analyses and summaries of papers listed in the course schedule. In doing this assignment the student will select 2 of the papers assigned for that day as well as one additional paper not listed in the schedule (selected by the student). Using the three papers, the student will provide an integrated summary and analysis of the main issues discussed on the papers. The summary should be (double spaced), 4-5 pages long, and should include the following: (See evaluation document as well)

- A brief summary of the articles, giving the reader a clear sense of what the papers were about
- An integrated analysis of the papers. Analyses should
 - be framed in such a way as to allow for comparison across the papers
 - assess the appropriateness and reasonableness of the arguments, concepts, constructs and propositions
 - assess the application of theoretical concepts
 - assess the implications for practice in development settings.
- A synthesis of key ideas with conclusions drawn. In doing this the student should express a **personal point of view** relative to:
 - relevance and importance of the issues raised

- whether the authors have provided reasonable justification for their arguments
- the insightfulness and contributions of the papers to our understanding of emerging ICTs and business innovation.

The summaries are due at the beginning of the class in which the papers assigned are being discussed. Each person will be assigned one topic to focus on for one of the summaries. The student will have the freedom to choose the second topic. **HOWEVER**, the student **cannot** submit a summary for a class that he/she did not attend. In other words, if you miss a week, you cannot submit a paper summary for that week. Showing up and then leaving after part of the class also does not constitute attending. You also **may NOT** submit a summary for the papers you are presenting as a group. Your first summary and analysis must be submitted by September 26, 2017. There will be no extensions for the submissions.

Individual Essay: Reflections on Emerging Technologies and Organizational Innovation

The final assignment for the course is an essay of no more than 4-5000 words reflecting on a particular set of issues related to emerging technologies and business innovation. In doing the essay, the student will identify a particular emerging technology (e.g. AI, AR, cloud computing, etc.) or an application area (business, government, non-government organizations, etc.) on which to focus. The paper should discuss the potential of the technology to drive change, pros and cons of using such a technology and should consider the realities faced by the organization that adopts such a technology. The essay must not be purely descriptive. It should critically analyze the issue or application being covered and provide insights that have implications for further study on these topics. Students are expected to use at least ten original sources (at least 5 from refereed journals). They may also draw on their own experiences as well as external sources such as interviews with subject matter experts or industry leaders to provide perspective and context. The paper should be appropriately referenced using APA format citation style.

Summary of Deliverables

| | Deliverable | Submit to | Due Date | % of Grade |
|---|--------------------------------------|------------------|--|-------------------|
| 1 | Essay Proposal | Professor | 2 nd week of class | - |
| 1 | Group seminar leadership | Professor | By 12:00 noon. on assigned date | 20 |
| 2 | Individual article summaries | Professor | At the start of class on assigned date. | 20 |
| 1 | Draft of emerging technology essay | Professor | At start of 4 th class period Nov, 27, 2017 | |
| 1 | Individual emerging technology essay | Professor | December 18, 2017 | 40 |
| 1 | Seminar leadership peer evaluation | Professor | December 18,2017 | - |

Assignment Submission

All written assignments including the group project should be submitted to the Professor by **12:00 noon via cuLearn**, on the day they are due. The assignments should be submitted in .pdf format. No printed document is required. All documents should have the student's name, number, email address and course section.

It is the student's responsibility to ensure that all assignments are received in an accessible format on or before the due date. Assignments are due at the time indicated. Late assignments will be marked down by 10% for every calendar day late.

ITIS 5414 Emerging Information Technologies and Business Innovation

Tentative Class Schedule

| Dates | Topic | Presenters | Readings/Assignment (Accessible through Carleton Library online) | Practitioner's Perspective |
|-------|---|------------|---|---|
| Nov 6 | Introduction Identifying and assessing emerging information technologies | G Grant | <p>Gaver, W. W. Technology affordances, http://www.cs.umd.edu/class/fall2002/cmssc434-0201/p79-gaver.pdf</p> <p>Munroe, R. T. (2010) Emerging information technologies analysis framework http://cmuq-mis.wikispaces.com/file/view/EIT+Analysis+Model+v1.1.pdf</p> | <p>Wood, R. <i>Understanding technology hype cycles</i> http://www.wired.com/geekdad/2017/08/hype-cycles/</p> |
| 13 | Open Innovation, Open Data, and Open Source Innovation for development | G Grant | <p>Chesbrough, H. (2017) Open Innovation: Where we've been and where we're going, <i>Research Technology Management</i>, July-August, p. 20-27.</p> <p>Bingham, A. and Spradlin, D. The open innovation framework http://www.innocentive.com/files/the_open_innovation_marketplace_chapter_3.pdf</p> <p>King, A. and Lakhani, K. R. (2013) Using Open Innovation to identify the best ideas, <i>MIT Sloan Management Review</i>, September 11, accessed at http://sloanreview.mit.edu/article/using-open-innovation-to-identify-the-best-ideas/</p> <p>Lee, M., Almirall, E., and Wareham, J. (2016) Open Data and Civic Apps: First –Generation failures, second-generation improvements, <i>Communications of the ACM</i>, Vol. 59 No. 1, Pages 82-89 https://m.cacm.acm.org/magazines/2016/1/195725-open-data-and-civic-apps/fulltext?mobile=true</p> <p>Stallman, R. (2009) Why “Open Source”, misses the point of free software, <i>Communications of the ACM</i>, 52(6), p.31-33.</p> <p>Morelli, et al (2009) Revitalizing computing education through Free and Open Source Software for Humanity, <i>Communications of the ACM</i>, (52)8, pp. 67-75.</p> <p>Cleverley, M. (2009) How ICT Advances Might Help Developing Nations, <i>Communication of the ACM</i>, 52(9), p.30-32.</p> | <p>Crowdsourcing innovation http://www.innocentive.com/</p> <p>http://www.innocentive.com/for-solvers/winning-solutions/low-cost-rainwater-storage-system</p> <p>Crowdsourcing Crises http://ushahidi.com/</p> <p>Scientists without Borders http://www.scientistswithoutborders.org/</p> <p>Open Data Canada http://open.canada.ca/en/open-data</p> <p>World Bank Open Data https://data.worldbank.org/</p> <p>NetHope http://nethope.org/</p> |
| 20 | Digital platforms and sharing economy | Group 1 | <p>Platform Hunt (2016) The 9 types of software platforms, June 12, accessed at https://medium.com/platform-hunt/the-8-types-of-software-platforms-473c74f4536a</p> <p>Knee, J. A. (2017) All platforms are not equal: why Airbnb will always be a better business than Uber, <i>MIT Sloan Management Review</i>, September 15, accessed at http://sloanreview.mit.edu/article/all-platforms-are-not-equal/</p> | <p>World Economic Forum, The Platform Economy https://www.youtube.com/watch?v=yldXC7JyUtM</p> <p>Accenture, Digital Platforms https://www.youtube.com/watch?v=PhBVrc5eQ5M</p> |

| Dates | Topic | Presenters | Readings/Assignment (Accessible through Carleton Library online) | Practitioner's Perspective |
|-------|---|------------|--|--|
| | | | <p>Greenwood, B., Burch, G., and Carnahan, S. (2017) Unknowns of the Gig-Economy, <i>Communications of the ACM</i>, Vol. 60 No. 7, Pages 27-29 accessed at https://m.cacm.acm.org/magazines/2017/7/218863-unknowns-of-the-gig-economy/fulltext?mobile=true</p> <p>Malhotra, A. and Van Alstyne, M. (2014) The dark side of the Sharing Economy and how to lighten it, <i>Communications of the ACM</i>, November,57(11), 24-27.</p> <p>Abbie-Gayle Johnson, Barbara Neuhofer, (2017) "Airbnb – an exploration of value co-creation experiences in Jamaica", <i>International Journal of Contemporary Hospitality Management</i>, Vol. 29 Issue: 9, pp.2361-2376, https://doi.org/10.1108/IJCHM-08-2016-0482 Permanent link to this document: https://doi.org/10.1108/IJCHM-08-2016-0482</p> <p>Cohen, B. and Koetzmann, J. (2014) Ride on! Mobility Business models and the Sharing Economy, <i>Organization & Environment</i>, 27(3) 279-296.</p> | |
| 27 | Artificial intelligence and cognitive computing | Group 2 | <p>Jones, M. T. (2017) A beginner's guide to artificial intelligence, machine learning, and cognitive computing, IBM developerWorks, June 1, accessed at https://www.ibm.com/developerworks/library/cc-beginner-guide-machine-learning-ai-cognitive/index.html</p> <p>Parnas, D. L. (2017) The real risks of artificial intelligence: incidents from the early days of AI research are instructive in the current AI environment, <i>Communications of the ACM</i>, 60(10), pp.27-31.</p> <p>Monroe, D. (2017) Deep learning takes on translation, <i>Communications of the ACM</i>, 60(6), pp.12-14.</p> <p>Ross, J. (2017) The fatal flaw of AI implementation, <i>MITSloan Management Review</i>, July 14, accessed at http://sloanreview.mit.edu/article/the-fatal-flaw-of-ai-implementation/</p> | <p>Rometty, G. (2016) digital today, Cognitive Tomorrow, MIT Sloan Management Review, September 12 accessed at http://sloanreview.mit.edu/article/digital-today-cognitive-tomorrow/</p> <p>Davenport and Kirby https://youtu.be/v1rV70oBjnA</p> <p>Jeremy Howard – TED https://www.ted.com/playlists/310/talks_on_artificial_intelligen</p> |
| 04 | Innovating with the Blockchain | | <p>Catalini, C. and Gans, J. (2016) Some simple economics of the blockchain, MIT Sloan School Working Paper 5191-16 accesses at http://ide.mit.edu/sites/default/files/publications/SSRN-id2874598.pdf</p> <p>TIM Review Special Issue on Blockchain, October 2017 http://timreview.ca/issue/2017/october</p> <p>Draft Essay Due</p> | <p>Guest Speaker: Udayan Deshmukh IBM</p> <p>Understand Blockchain in Two Minutes https://www.youtube.com/watch?v=r43LhSUUGTQ</p> <p>Blockchain: Massively Simplified https://www.youtube.com/watch?v=k53LUZxUF50</p> <p>Blockchain Technology and Global Development https://www.youtube.com/watch?v=rJ95ygJ4iTs</p> |

| Dates | Topic | Presenters | Readings/Assignment (Accessible through Carleton Library online) | Practitioner's Perspective |
|-------|---|------------|---|--|
| 11 | Immersive experiences virtual reality, and augmented reality, 4D printing | Group 3 | <p>Berryman, D. R. (2017) Augmented Reality: A review, <i>Medical Reference Services Quarterly</i>, 31(2), pp. 212–218</p> <p>Kroeker, K. L. (2010) Mainstreaming augmented reality, <i>Communications of the ACM</i>, 53(7), pp. 19-21.</p> <p>Materializing information: 3D printing and social change Ratto, Matt, AND Ree, Robert. "Materializing information: 3D printing and social change" <i>First Monday</i> [Online], Volume 17 Number 7 (27 June 2017)</p> <p>Hart, B. (2017) Will 3D printing change the world?, http://www.forbes.com/sites/gcaptain/2017/03/06/will-3d-printing-change-the-world/</p> <p>Kirkpatrick, K. (2017) 3D-Printing human body parts, <i>Communications of the ACM</i>, 60(10), pp.15-17.</p> <p><u>Anonymous</u>. (2017) A third industrial revolution, <i>The Economist</i>, 403. 8781 (Apr 21,): 3-4.</p> <p>Rieland, R. (2014) Forget the 3D printer: 4D printing could change everything, accessed at https://www.smithsonianmag.com/innovation/Objects-That-Change-Shape-On-Their-Own-180951449/</p> | <p>Print me a phone http://www.economist.com/node/21559593</p> <p>Ikea's Augmented Reality Catalog Will Let You Peek Inside Furniture http://www.wired.com/gadgetlab/2017/07/ikea-s-augmented-reality-catalog-lets-you-peek-inside-the-malm/</p> |
| 18 | | | Final Essay Due | |

IMPORTANT ADDITIONAL INFORMATION

Course Sharing Websites

Student or professor materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

Policy on Mobile Devices

The use of mobile devices IS NOT PERMITTED in this class. It is disruptive to the instructor and class members. If you carry such a device to class, please make sure it is turned off. If an emergency situation requires you to keep it turned on, please discuss this with your instructor prior to class.

Group Work

The Sprott School of Business encourages group assignments in the school for several reasons. They provide you with opportunities to develop and enhance interpersonal, communication, leadership, followership and other group skills. Group assignments are also good for learning integrative skills for putting together a complex task. Your instructor may assign one or more group tasks/assignments/projects in this course.

Before embarking on a specific problem as a group, it is your responsibility to ensure that the problem is meant to be a group assignment and not an individual one.

Person with Disabilities

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Religious Observance

Students requesting academic accommodation on the basis of religious observance should make a formal, written request to their instructors for alternate dates and/or means of satisfying academic requirements. Such requests should be made during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist, but no later than two weeks before the compulsory academic event. Accommodation is to be worked out directly and on an individual basis between the student and the instructor(s) involved. Instructors will make accommodations in a way that avoids academic disadvantage to the student.

Students or instructors who have questions or want to confirm accommodation eligibility of a religious event or practice may refer to the Equity Services website for a list of holy days and Carleton's Academic Accommodation policies, or may contact an Equity Services Advisor in the Equity Services Department for assistance.

Pregnancy

Pregnant students requiring academic accommodations are encouraged to contact an Equity Advisor in Equity Services to complete a *letter of accommodation*. The student must then make an appointment to discuss her needs with the instructor at least two weeks prior to the first academic event in which it is anticipated the accommodation will be required.

Academic Integrity

Violations of academic integrity are a serious academic offence. Violations of academic integrity – presenting another’s ideas, arguments, words or images as your own, using unauthorized material, misrepresentation, fabricating or misrepresenting research data, unauthorized co-operation or collaboration or completing work for another student – weaken the quality of the degree and will not be tolerated. Penalties may include expulsion; suspension from all studies at Carleton; suspension from full-time studies; a refusal of permission to continue or to register in a specific degree program; academic probation; and a grade of Failure in the course, amongst others. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy which is available, along with resources for compliance at: <https://carleton.ca/registrar/academic-integrity/>.

Important dates and deadlines

<https://sprott.carleton.ca/students/mba/dates-deadlines-policies/>