

**Department of Geography and Planning**  
**UNIVERSITY OF TORONTO**  
**Geography of Innovation**  
**GGR 251**  
**Spring 2016**

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**Course Description**

This course aims to understand the spatial disparities and dynamics of technological innovation. Employing an interdisciplinary approach, we explore how key technological sectors are initiated in different economic and institutional contexts, how they change through time, and how they are influenced by market competition and institutional arrangements at different geographic scales.

Innovation has become a major field of study in a number of social science disciplines, geography included. Contemporary economic geographic studies have greatly enriched our understanding of the innovation process by drawing attention to geographic proximity and knowledge spillover. However, our knowledge about the deep causality of spatially uneven practice and performance of innovation remains fairly limited. Frequently either a firm-centric or state-centric framework is adopted in existing analyses of innovation. In this course, we seek to draw attention to the interplay between business firms and state institutions.

In contrast to the commonly found theoretical-oriented approaches and standing-alone case studies, this course takes an empirical, comparative and global approach to explore how new technologies, new firms and new markets rise and fall (or rise again) within actually-existing geographic, historical, and globally-interactive contexts. Whenever possible, we take an explicit comparative and relational angle to examine the variegated and interlinked emergence, development and innovative performance of the same sector in different regions and nations. Attention is drawn primarily to the geo-historical dynamics of the semiconductor industry electronics sectors, especially. Other major sectors such as automobiles and biotechnology will also be examined.

Starting with a critical scrutiny of the iconic Silicon Valley, we examine and compare various cases at multiple analytical levels and geographic scales. Over the course of the term, we will cover technological innovation and economic transformation in both the core countries (especially the U.S. and Japan) and major emerging economies, especially those in East Asia. We

also explore the key role of universities and finance for innovation, and draw attention to the dark side of financialization that may divert resources away from ‘creative destruction’ to ‘destructive creation’.

### Course Evaluation

The course evaluation will be based on the following aspects:

10%	<b>Film Review I</b> ( <i>The Social Network</i> , <b>600-800 words</b> , due Week 4, <b>Feb. 2</b> at the beginning of class)
10%	<b>Research Proposal</b> ( <b>400-500</b> words, plus bibliography; due Week 6, <b>Feb. 23</b> at the beginning of class)
10%	<b>Film Review II</b> ( <i>Enron: The Smartest Guys in the Room</i> , <b>600-800 words</b> , due Week 10, <b>March 22</b> at the beginning of class)
30%	<b>Research Paper</b> ( <b>1400-1600</b> words, plus reference; due Week 12, <b>April 5</b> at the beginning of class)
40%	<b>Final Exam</b>

### Film Review I:

*The Social Network* is a 2010 American biographical drama film directed by David Fincher and written by Aaron Sorkin. It is adapted from Ben Mezrich's 2009 book *The Accidental Billionaires: The Founding of Facebook, A Tale of Sex, Money, Genius, and Betrayal* (New York: Doubleday). The film portrays the founding of social networking website Facebook and the resulting lawsuits. Although the film is dramatized and not entirely fact-based, it is still very stimulating in making sense of technological entrepreneurship and the geography of innovation in the context of this course. Your review is expected to be **600-800 words** and address the following questions:

- 1) According to the film, where did Zuckerberg's idea for Facebook.com come from and how it has evolved over time?
- 2) From the film, what did you learn about the gap between a creative idea and a profitable business organization?
- 3) What do you learn from the film about the issue of intellectual property rights (IPRs) for technological entrepreneurship? Do you think that the Winklevoss brothers deserve the settlement with Zuckerberg which valued \$466 million, since they think that Zuckerberg stolen the ideas in ConnectU?
- 4) Why did Facebook move from Boston to Silicon Valley rather than New York?
- 5) According to the film, what role did venture capitalists play to the growth of Facebook?

Furthermore, you are encouraged in your review to make connections to key concepts appeared in the glossary and discussed in class.

This film has been placed on Course Reserves at Media Commons (VideoDVD 756617) in Robarts Library.

## **Film Review II:**

We will discuss the Enron case as innovation corrupted in details in Week 11. Before the lecture, you are expected to watch the documentary film and complete a review, so that you could develop a decent understanding of the case and relevant issues and we could also have an enriched discussion in class.

*Enron: The Smartest Guys in the Room* is a 2005 documentary film based on the best-selling 2003 book of the same name by Fortune reporters Bethany McLean and Peter Elkind, a study of one of the largest business scandals in American history. The film examines the 2001 collapse of the Enron Corporation, which resulted in criminal trials and subsequent imprisonment of several of Enron's top executives. Your review is expected to be **600-800 words** and address the following questions:

- 1) What really went wrong and led to the collapse of Enron, once the most innovative American company?
- 2) What is the connection between corporate governance and the financial market, in the example of Enron?
- 3) In your view and given what you have learned from this course, what is the role of geography in the rise and fall of Enron?
- 4) Is there anything from the film that has changed your understanding about the popular notion of 'free market'?

You are also encouraged in your review to make connections to key concepts appeared in the glossary and discussed in class.

This film is available at Media Commons (VideoDVD 751618) in Robarts Library. You can also watch it online:

<http://media2.criterionpic.com.myaccess.library.utoronto.ca/htbin/wwform/006?t=AL086325>

## **Research Project: Geography and Technological Innovation**

Students are expected to develop an empirical research project centered on the geography of technological innovation and an explanatory argument based on the "geography as accessibility" approach as discussed in class. The empirical research should examine a particular technological sector, e.g., personal computer, Internet, mobile telecom, software, video game, automobile, bio-tech, clean energy, precision machinery, aerospace, etc., or a particular business firm specialized in one of such sectors. The semiconductor sector is excluded since it will be extensively covered in lectures. Here a technology sector is broadly defined as an industrial sector involving substantive research and development (R&D) activities, which may or may not be conducted in-house by business firms. If your choice is a sector, your geographic scope can be either a city/region or a nation, and you are expected to document and explain the sector's origination and evolution in that particular territory. If your choice is a firm, other than a general account of the firm's history, you are expected to focus on the origination, evolution and spatial trajectory of just one primary technological product that the firm is good at producing, since the firm could be a transnational conglomerate with many different subsidiary companies and/or product lines, such as Samsung Group and Samsung Electronics.

In any case, your chosen territory or firm should have achieved some identifiable success, as leader or follower, in the technological sector in question. You are expected to briefly summarize the major technological development and economic performance milestones of the sector/firm, as

well as its evolving spatial pattern. Of course there can always be the crucial contribution from some scientific or technological geniuses and smart business strategies, your explanation should focus instead on geographic factors. Your explanatory argument should take a “geography as accessibility” perspective, and engage at least TWO of the following elements (which are not necessarily mutually exclusive, and some may be the cause of others): 1) accessibility to favorable resource endowments; 2) accessibility to tangible inputs, especially capital; 3) accessibility to intangible inputs, especially knowledge; 4) accessibility to public infrastructure and facilities; 5) accessibility to key business partners and suppliers; 6) accessibility to markets and/or clients; 7) accessibility to a favorable labor pool; 8) accessibility to social/business networks; 9) accessibility to enabling state institutions and policies, and 10) accessibility to favorable cultural norms and conventions.

**Research Proposal:** The proposal should 1) identify and justify your chosen technological sector, territory or business firm; 2) put forward a general explanatory argument from a ‘geography as accessibility’ perspective regarding the success of your chosen case; 3) provide a basic structure of the argument to be advanced; 4) list three academic sources to be used; and 5) give an annotated bibliography offering a brief overview of the three sources. Your larger research paper should develop a thesis related to the tentative explanatory argument stated in the research proposal and the comments received on it. Though it is OK if you believe it is necessary to change your mind after further studies. Developing a strong thesis is crucial for the success of your essay. You will receive assistance from the instructor and TA on this along the way. For some tips on developing a strong thesis, please visit the following site:

<http://www.writing.utoronto.ca/advice/planning-and-organizing/thesis-statements> For more information on U of T writing resources and support, see [www.writing.utoronto.ca](http://www.writing.utoronto.ca) and <http://geography.utoronto.ca/departement/resources-for-dept/wit-program/>

**Research Paper:** The length of the paper is expected to be **1400-1600 words**. It is expected to rigorously follow your revised proposal after digesting comments and feedbacks from the instructor and/or TA. More detailed guidelines and assistance will be provided later.

### **Assignment submission and late penalty**

You must submit a hard copy of your assignments in class at the beginning of class (**1pm**). Assignments submitted after class has started will be considered one day late. Email submissions by the deadline can only be accepted when a legitimate reason is given and a hardcopy is submitted subsequently within **48 hours**. Please submit late assignments through the Drop Box in the Geography Main Office, Sidney Smith Hall 5047 (open Monday through Friday, 9 am - 5 pm). Since the Main Office doors are locked at closing time (sharp!), it’s a good idea to plan to get there at least 15 minutes before. The penalty for late assignments is 5% per day, with the weekend counting as one day. Nothing will be accepted one week after the deadline unless you have made previous arrangements with the instructor (e.g., due to illness). Be sure to keep electronic copies of your assignments. Students are strongly advised to keep all rough and draft work as well as hard copies of their research papers and assignments until the marked assignments have been returned and the grades been posted on ROSI.

Extensions will be granted sparingly in the case of illness, and you must present me with a completed U of T medical certificate (<http://www.illnessverification.utoronto.ca/>). Please consult your college registrar should you be having difficulties during term that prevent you from completing your course work due to extenuating circumstances. Further information can be found

at the following link:<http://www.artsandscience.utoronto.ca/ofr/calendar/rules.htm#term>

### Schedule

Week (date)	Theme	Readings
Week 1: Jan. 12	Introduction	Salter&Oliver 2014
Week 2: Jan. 19	Geography and Innovation	Asheim&Gertler 2005; Feldman&Kogler 2010
Week 3: Jan 26	Silicon Valley: the Global Icon of Innovation	Saxenian 1991; Lécuyer 2000
Week 4: Feb. 2	Silicon Valley and <i>the Military-Industrial-Academic Complex</i>	Leslie 2000; Mazzucato 2013
Week 5: Feb. 9	“Silicon Valleys East”: Japan and Singapore	Angel 1994; Mathews 1999
Feb. 16	Reading Week	
Week 6: Feb. 23	“Silicon Valleys East”: South Korea and Taiwan	Hwang&Choung 2014; Dicken 2007
Week 7: Mar. 1	Toyota and Innovation in the Auto Industry	Bernstein 1995; Fine&Raff 2002
Week 8: Mar. 8	San Diego and Innovation in Biotech	Walshok&Lee 2014; Cortright&Mayer 2002
Week 9: Mar. 15	University and Innovation	Fishman et al. 2014; Bramwell&Wolfe 2008
Week 10: Mar. 22	Finance and Innovation	Lazonick 2007; Kenney&Florida 2000
Week 11: Mar. 29	Innovation Corrupted?	Healy&Palepu 2003; Lazonick 2014
Week 12: Apr. 5	Summary and Review	

**Contacting me:** I expect students to take advantage of my office hours to discuss the course. Please come to office hours or make an appointment if you wish to discuss matters related to the class. Try not to ask questions by email that is difficult to respond briefly. I will try to get back to you within 48 hours. Students should use their U of T email account in all course correspondence, and emails should include GGR251 in the subject line.

**Use of electronic devices:** I expect cell phones and other communications devices to be either turned off or in silent mode. Do not answer your phone or text message during class. Although you may want to use your electronic devices to read papers, take notes and so on, I would strongly recommend you to stay away from them as much as possible. It is better that you can keep yourself and your classmates away from unnecessary distractions.

**Plagiarism:** All cases of suspected plagiarism are taken very seriously. It is your responsibility to know and follow University rules and regulations including those that cover plagiarism, missed exams, etc. Plagiarism is quoting (or paraphrasing!) the work of an author (including the work of a fellow student) without a proper citation. If you use word-for-word copy of text from source, you must use quotations marks along with citation. Students should not submit any academic

work for which credit has previously been obtained or is being sought. Please consult the “Rules and Regulations” section of the Arts and Science Calendar ([www.artsandscience.utoronto.ca/ofr/calendar/rules.htm](http://www.artsandscience.utoronto.ca/ofr/calendar/rules.htm)) for further information and check the ‘How not-to plagiarize’ website at <http://www.writing.utoronto.ca/advice/using-sources/how-notto-plagiarize>

**Accessibility:** If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: [disability.services@utoronto.ca](mailto:disability.services@utoronto.ca) or visit <http://studentlife.utoronto.ca/accessibility>

## **Topics and Required Readings**

### **Week 1 Introduction: Making Sense of Innovation, Geographically (Jan. 12)**

Salter, Ammon and Alexy, Oliver 2014. “The nature of innovation,” pp. 26-50, in *The Oxford Handbook of Innovation Management*, Mark Dodgson, David M. Gann, and Nelson Phillips (eds.), Oxford: Oxford University Press.

### **Week 2 Geography and Innovation (Jan. 19)**

Asheim, Bjørn T. and Gertler, Meric S. 2005. “The geography of innovation: regional innovation systems,” pp. 291–317, in Jan Fagerberg, David C. Mowery and Richard R. Nelson (eds.), *The Oxford Handbook of Innovation*, Oxford: Oxford University Press.

Feldman, Maryann P. and Dieter F. Kogler 2010. “Stylized facts in the geography of innovation,” pp. 381-410, in Bronwyn H. Hall And Nathan Rosenberg (eds.) *Handbook of the Economics of Innovation*, Volume 1, Amsterdam: North Holland.

### **Week 3 Silicon Valley: the Global Icon of Innovation (Jan. 26)**

Saxenian, AnnaLee 1991. The origins and dynamics of production networks in Silicon Valley, *Research Policy* 20: 423-437.

Lécuyer, Christophe 2000. “Fairchild semiconductor and its influence,” pp. 158-183, in Lee, Chong-Moon, Miller, W.F., Hancock, M.G., and Rowen, H.S. (eds.) *The Silicon Valley Edge: A Habitat for Innovation and Entrepreneurship*. Stanford, Calif.: Stanford University Press.

### **Week 4 Silicon Valley and the Military-Industrial-Academic Complex (Feb. 2)**

Leslie, Stuart 2000. “The biggest ‘angel’ of them all: the military and the making of Silicon Valley,” pp. 48–67 in Martin Kenney (ed.) *Understanding Silicon Valley: The Anatomy of an Entrepreneurial Region*. Stanford: Stanford University Press.

Mazzucato, Mariana 2013. *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. London: Anthem Press. Chapter 5: The state behind the iPhone, pp. 87-112.

### **Week 5 “Silicon Valleys East”: Japan and Singapore (Feb. 9)**

Angel, David 1994. *Restructuring for Innovation: The Remaking of the U.S. Semiconductor Industry*. New York: The Guilford Press. Chapter 3: The challenge of global competition, pp. 63-88.

Mathews, John A. 1999. A silicon island of the east: creating a semiconductor industry in Singapore, *California Management Review* 41: 55-78.

### **Week 6 Silicon Valleys East: South Korea and Taiwan (Feb. 23)**

Hwang, Hye-Ran & Jae-Yong Choung 2014. The co-evolution of technology and institutions in the catch-up process: the case of the semiconductor industry in Korea and Taiwan, *Journal of Development Studies* 50: 1240-1260.

Dicken, Peter 2007. *Global Shift: Mapping the Changing Contours of the World Economy*, 5th edition. New York: Guilford. Chapter 11: ‘Chips with everything’: the semiconductor industry, pp. 317-346.

### **Week 7 Toyota and Innovation in the Auto Industry (March 1)**

Bernstein, Jeffrey 1995. “Toyota automatic looms and Toyota automobiles,” Chapter 11 of McCraw, T. K. (eds.) *Creating modern capitalism: how entrepreneurs, companies, and countries triumphed in three industrial revolutions*. Cambridge: Harvard University Press, pp. 396-438.

Fine, Charles H. and Daniel M.G. Raff 2002. “Automobiles”, pp. 416-432 in Steil, Benn, David G. Victor, and Richard R. Nelson (eds.) *Technological Innovation and Economic Performance*. Princeton: Princeton University Press.

### **Week 8 San Diego and Innovation in Biotech (March 8)**

Walshok, Mary and Carolyn Lee 2014. “The partnership between entrepreneurial science and entrepreneurial business: A study of integrated development at UCSD and San Diego’s high-tech economy”, pp. 129-155, in Thomas J. Allen and Rory O’Shea (eds.) *Building Technology Transfer within Research Universities: An Entrepreneurial Approach*, Cambridge: Cambridge University Press.

Cortright, Joseph and Mayer, Heike 2002. *Signs of Life: The Growth of Biotechnology Centers in the U.S.*. Washington, DC: Center on Urban and Metropolitan Policy, The Brookings Institution.

### **Week 9 University and Innovation (March 15)**

Fishman, Elliot A., Rory P. O’Shea, and Thomas J. Allen 2014. “Creating the MIT entrepreneurial ecosystem,” pp. 60-86, in Thomas J. Allen and Rory O’Shea (eds.) *Building Technology Transfer within Research Universities: An Entrepreneurial Approach*, Cambridge: Cambridge University Press.

Bramwell, Allison and David A. Wolfe 2008. Universities and regional economic development: the entrepreneurial University of Waterloo, *Research Policy* 37: 1175-87.

### **Week 10 Finance and Innovation (March 22)**

Lazonick, Williams 2007. The U.S. Stock market and the governance of innovative enterprise, *Industrial and Corporate Change* 16: 983-1035.

Kenney, Martin and Richard Florida 2000. "Venture capital in Silicon Valley: fueling new firm formation", pp. 98-123 in Martin Kenney (ed.) *Understanding Silicon Valley: The Anatomy of an Entrepreneurial Region*, Stanford: Stanford University Press.

### **Week 11 Innovation Corrupted? (March 29)**

Healy, Paul M. and Krishna G. Palepu 2003. The fall of Enron, *Journal of Economic Perspectives* 17: 3-26.

Lazonick, Williams 2014. Profits without prosperity: stock buybacks manipulate the market and leave most Americans worse off, *Harvard Business Review*, September, pp. 46-55.

### **Week 12 Conclusion and Review (April 5)**

**A list of suggested readings and a glossary of key concepts will be provided separately.**