

# SOSC 1130: Science, Technology and Business

Fall 2014

Class Meeting Times: Wednesdays and Fridays 3:00 pm – 4:20 pm | Lecture Theater A

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## *Description:*

This course introduces newly emerging ideas that are central to the field of science, technology and society (STS) and considers their applications to business practices. While serving as an introduction to students who plan to minor in STS (for example, in pursuing STS studies at the postgraduate level), this course is also aimed at students with backgrounds in business, science and engineering, or the humanities who are curious to learn more about the following issues: what we mean by science and technology (S&T); the mutual relationship between S&T and business; and how S&T have intervened historically in the wider business domain. Through this course we endeavor to understand better how S&T and business have become increasingly interconnected over time, and how they contribute to greater profits in the wider spheres of economics, business and finance. The course format features lectures and a focus on contemporary business issues.

## *Teaching Objectives:*

In this course, my primary objective is to transmit content related to Science, Technology and Business to you, so that you will have a solid foundation in the knowledge base comprising these three broad areas. I will also try to influence your academic and personal development hoping that, by the end of my course, you will have strengthened your enthusiasm for learning, a felt need for and enjoyment in acquiring knowledge, skills, and attitudes that you can apply in your lives. I will strive to do all of this by working in cooperation with you—by creating partnerships—as an educational partnership at its best helps you learn new skills that you can take with you, from my classroom and use in other educational settings or in whatever you choose to do after you graduate.

## *Intended Learning Outcomes:*

There are five broad **intended learning outcomes** that all students should master.

By the end of this course, you should be able to:

1. **Describe** characteristics of scientific and technological phenomena as they have played out in history and as they affect contemporary society, especially Hong Kong businesses.
2. **Explain** how and why scientific and technological change occurs and has impacted our society based on an understanding of science, technology and business and their impact in society.
3. **Compare and contrast** how science/technology and business mutually shape one another, and how this mutual shaping has evolved into the present day.

## Associated Teaching Activity

I use Personal Response System (PRS) exercises to test the extent to which you all are grasping the topics as we progress through the course and from this I can adjust my teaching as necessary. This teaching and learning activity, using wireless technology developed by

HKUST faculty, provides a context in which both you and I can assess the extent to which you can identify, describe, and explain the key characteristics of whatever topic we cover in this class.

#### Assessing Your Understanding Of Knowledge from the Course

More generally, your grasp of the knowledge you gain from this course will be assessed through multiple choice exam questions. But I will front-load questions pertaining to more factual (and conceptual) knowledge into the mid-term. As the course progresses, we will move from conveying the elements of a subject area into providing and assessing your ability to apply the knowledge (see below), which provides for a richer, less mechanical final exam.

4. You will be able to **use** the subject knowledge effectively in a variety of contexts and activities. The ability to apply knowledge is at least as important as the ability to recall and explain factual knowledge and, for students with the interest and aptitude to move to more challenging levels of learning, perhaps more important. Applying knowledge to more complex situations and problems will help you to develop your ability to think critically about important issues that matter to you, and effectively put that knowledge to work for your own ends, not only after you have completed this class, but also after you have graduated from HKUST.

#### Associated Teaching Activity

There are two key activities to help you learn how to apply your knowledge and develop your critical thinking ability:

First, I present topics in Science, Technology and Business with many real-life examples and illustrations to which you can relate. In other words, I try to make my course material as up-to-date and culturally familiar as I possibly can.

Second, in addition to presenting examples orally, I will regularly embed crisp, concise video clips (typically two to nine minutes in length) into my PowerPoint presentations to reinforce whatever knowledge I am presenting. The use of short video clips helps you effectively remember the knowledge I am trying to impart. Sometimes these clips are taken from documentaries, sometimes they are from popular movies, while at other times from local news stations.

#### Assessing Your Ability to Apply Knowledge from the Course

I will assess this by asking you to *use* the factual (and conceptual) knowledge you have learnt. Specifically, in designing my multiple choice exam questions, the focus will be to test your ability to apply knowledge, by providing you with case studies based on which you must answer between two and six questions.

5. You will have the conceptual tools needed to **pursue more advanced work** in the broad area of STS (Science, Technology and Society).

#### *Prerequisites:*

There are no prerequisites for this course other than an inquisitive mind and a sense of academic enthusiasm. If you have previously taken (or are currently taking) other SOSC classes that focus on STS issues (such as SOSC 1110 or SOSC 1150), you may find it a little easier to keep up with the pace of this course.

*Requirements:*

Students are expected to attend all lectures and complete all the readings. It is in your direct interest to attend lectures as often and regularly as possible as ALL the exam questions are derived DIRECTLY from the lectures and, by extension, the readings.

*Grade Distribution and Breakdown:*

The expected grade distribution (which is subject to change under special or unforeseen circumstances), is as follows:

A	15%
B	40%
C	35-40%
D	5%
F	Remainder

The course grade will comprise three components:

	<i>Comprising</i>	<i>Time</i>	<i>Format</i>
<b>1.</b> Mid-Term Exam	40%	During <i>or close to</i> Week 7	Multiple Choice Questions
<b>2.</b> Final Exam	45%	End of the semester	Multiple Choice Questions
<b>3.</b> Personal Response System (PRS) Exercises	15%	During class time throughout the duration of the 13-week term	Multiple Choice questions

1. All three evaluation components will be based on some combination of the following:  
a) Lecture notes/material      b) Assigned readings      c) Video clips shown in class
2. The mid-term exam will be held during our regular scheduled class time (in other words, you will not need to come at a separate, non-class time, to take the mid-term exam).
3. The **final exam will be cumulative** in terms of its coverage (i.e. everything we have learnt in the class will be examined in the final) although it will emphasize material learnt after the mid-term exam.
4. Both exams will be closed-book exams.
5. There will be a total of *approximately* 20 PRS exercises conducted throughout the term during class time.
6. PRS exercises will **not** be announced in advance: That is, PRS exercises will be conducted randomly and spontaneously. In some classes, there may be no PRS exercise at all; in other classes we may have more than one PRS exercise. Sometimes PRS exercises will be conducted at the beginning of class; sometimes PRS exercises will be conducted during the middle or at the end of class.
7. If you answer a PRS exercise correctly, you will receive:      10 points  
If you answer a PRS exercise incorrectly, you will receive:      4 points  
If you do not answer the PRS exercise at all, you will receive:      0 points
8. If you miss any given PRS exercise for whatever reason, there will be no opportunity to retake that particular PRS exercise, nor will you be granted exemption from that particular PRS exercise.

9. From the approximately 20 PRS exercises conducted throughout the term, I shall select a pool of 17 exercises AT THE END OF THE TERM. We will not know at any point during the term, which 17 PRS exercises are to be selected for consideration. From this pool of 17 exercises, I shall choose your 15 *best* scores. Your 15 best scores will serve as your PRS grade component.
10. If you do not have a PRS device, please go to the ITSC Service Desk to check out your personal ID-encoded PRS handset as soon as possible and ensure it is working properly. It is solely your responsibility to be sure that the device functions properly. I will **not** be entertaining ANY excuses whatsoever (such as forgetting to bring your PRS device to class, not having a battery in your PRS device, the PRS device malfunctioning despite your knowing the correct answer, etc.) if your PRS exercise answer is not registered by the PRS system in LTA.
11. **If the instructor, or the instructor's assistants find that any student is using more than one PRS device to answer a PRS question (i.e. answering PRS questions on behalf of friend(s)), the student in question, as well as the student whose device is being employed will receive zero marks for ALL PRS exercises, without an opportunity to appeal. Simply put: DO NOT USE MORE THAN ONE PRS DEVICE.**

*Readings:*

There is no single textbook for this course. Most of the readings are journal articles or book chapters, and will be available from the LMES. A small number of short readings may be distributed in class. The average amount of reading is 15 pages per week. During weeks when there are fewer than 15 pages to read, students are advised to read for the following week, when there may be significantly more than 15 pages required.

*Academic Honesty:*

I, as the course instructor, and HKUST as an institution places a strong emphasis on academic integrity and has introduced regulations to back this up. To help students and staff to understand the policy, a website has been established that explains the regulations, provides assistance for students in avoiding plagiarism, and sets out the role of faculty and staff when a case of cheating or plagiarism comes to their attention. Please visit the website at <http://www.ust.hk/vpao/integrity>.

*Schedule and Readings:*

**PART I: DEFINING AND CONCEPTUALIZING SCIENCE, TECHNOLOGY AND BUSINESS THROUGH TIME**

**Week 1:**            Wed 3 Sep, Fri 5 Sep                    **Introduction**

Sismondo, Sergio. 2004. The Prehistory of Science and Technology Studies. In *An introduction to science and technology studies*. Malden, MA: Blackwell Pub. [Ch.1/pp.1-11]

**Week 2:**            Wed 10 Sep, Fri 12 Sep                    **What do we Mean by Science?**

Sismondo, Sergio. 2004. The Kuhnian Revolution. In *An introduction to science and technology studies*. Malden, MA: Blackwell Pub. [Ch.2/pp.12-19]

**Week 3:** Wed 17 Sep, Fri 19 Sep **Technology and its Impact**

Sismondo, Sergio. 2004. Two Questions Concerning Technology. In *An introduction to science and technology studies*. Malden, MA: Blackwell Pub. [Ch.8/pp.75-85]

Mokyr, Joel. 1990. *The lever of riches: Technological creativity and economic progress*. New York: Oxford University Press. [Ch. Introduction/pp.1-14]

**Week 4:** Wed 24 Sep, Fri 26 Sep **Science and Technology in Business**

*The Economist*. 1999. Survey: Innovation in industry: Industry gets religion. Vol. 350. Issue 8107, 20 February. [pg. S5, 2 pages]

**Week 5:** Fri 3 Oct **The Industrial Revolution**

Kranzberg, Melvin. 1967. Prerequisites for Industrialization. In *Technology in Western Civilization, Vol. I*. New York: Oxford University Press, 1967. [pp. 217-230]

Note: NO CLASS on Wed 1 Oct (public holiday)

**Week 6:** Wed 8 Oct, Fri 10 Oct **Shift in Industrial Leadership to Pacific Rim**

Hobday, Michael. 1995. *Innovation in East Asia: The challenge to Japan*. Aldershot, Hants, England ; Brookfield, VT: E. Elgar. [Ch.2/pp.11-31]

**Week 7:** Wed 15 Oct, Fri 17 Oct **Review, Mid-Term Exam, Mid-Term Evaluation**

**Week 8:** Wed 22 Oct, Fri 24 Oct **The Relevance of Science and Technology for Economic Growth**

Freeman, Christopher, and Luc Soete. 1997. *The economics of industrial innovation*. 1st ed. Cambridge, MA: MIT Press. [Ch. Introduction/pp.1-22]

## **PART II: TOPICAL ISSUES IN THE SOCIAL STUDIES OF SCIENCE, TECHNOLOGY AND BUSINESS**

**Week 9:** Wed 29 Oct, Fri 31 Oct **Sources of Business Innovations: The Individual or a Network?**

Hughes, Thomas Parke. 1983. *Networks of power: Electrification in Western society, 1880-1930*. Baltimore: Johns Hopkins University Press. [Ch.1/pp.1-17]

**Week 10:** Wed 5 Nov, Fri 7 Nov **Interdependence of Science, Technology and Business**

Rosenberg, Nathan. 1982. *Inside the black box: Technology and economics*. Cambridge Cambridgeshire; New York: Cambridge University Press. [Ch.3/pp.55-80]

**Week 11:** Wed 12 Nov, Fri 14 Nov      **Interdependence of Science, Technology and Business (continued)**

Rosenberg, Nathan. 1982. *Inside the black box: Technology and economics*. Cambridge Cambridgeshire; New York: Cambridge University Press. [Ch.3/pp.55-80]

**Week 12:** Wed 19, Fri 21 Nov      **Diffusion of Science and Technology in Businesses**

Rogers, Everett M. 1995. *Diffusion of innovations*. 4th ed. New York: Free Press. [ch.10/pp.371-404]

**Week 13:** Wed 26 Nov, Fri 28 Nov      **Managing the Research and Development Function**

Reading assignment to be announced