HTS 4081, Spring 2004
Tuesdays, 3-6
Smith 203

Professor Steven Usselman
Smith 315, 4-8718
Hours: TTH, 12:30-2:00, and by appt.
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THE COMPUTER AGE

This seminar course examines the origins, refinement, and diffusion of computer technology during the second half of the twentieth century. Its focus is more on the creation of technology than on its use. Of course, users exert considerable influence over the development and refinement of new technology, so we will not ignore the ways in which computing technology has been incorporated into various realms over the course of the past five decades. But you should be aware that we will be spending much more time considering the people and institutions that directly shaped computer technology than we will contemplating the broader influence of computing in society.

This course is, in many respects, an extended case study of the dynamics of innovation in post-World War II America. We focus upon one of the principal areas of technical innovation – computing – in order to comprehend the ways in which innovation has occurred during the past half century. Innovation during this period has been characterized by several features: close collaboration between engineering and scientists and between universities, industry, and the military; a shift in regional dominance from the East Coast to the West Coast, as seen most dramatically in the rise of Silicon Valley; an oscillation between large and small firms as primary sources of innovation; growing globalization of the innovation process. Readings and discussions attempt to make sense of these phenomena and many others.

We will be spending much of our time during the weeks ahead in the presence of engineers, computer scientists, and business managers. Such people dominate many of our readings and appear prominently in almost all of them. A major objective of the course is to comprehend something of what makes these people tick. Computer technology has always been infused with a great deal of enthusiasm. People show extraordinary willingness to work long and hard on computing, and many embrace computer technology as a potential panacea for the world's problems. We need to grasp something of that enthusiasm in order to comprehend the rise of the computer age.

While making use of tools from economics, sociology, and organizational studies, this course remains solidly grounded in history. Though the events we will study may not always be far removed from our own time, we are interested above all in change over time. The readings follow a general chronology, and your papers should be historical in nature.

Readings

We will read several books and many assigned articles, which should be available on-line or in rare cases through the HTS reading room on the second floor of D.M. Smith.

The required books, available at Engineer's Bookstore, are:

Ceruzzi, A History of Modern Computing
Hiltzik, Dealers of Lightning
Kaplan, The Silicon Boys
Kenney, Understanding Silicon Valley
Kidder, The Soul of a New Machine
Saxenian, Regional Advantage

Discussion

This is a seminar course. Each week we meet to discuss a common set of readings and to hear a supplementary presentation by one or two students. Participation in discussion is absolutely required for you to do well in this course. Obviously, you cannot participate if you do not attend. And you cannot participate intelligently unless you have done the readings and thought about them.

In order to encourage discussion, I am requiring each student to submit a comment for discussion in advance of class each week. You will do this by submitting a comment to the discussion forum available on WebCT. Ideally, your comment should end with a question that you would like to see the group consider during the in-class discussion. These submissions are due at 11:00 a.m. on the morning of class. Earlier, of course, is better. People should feel free to respond to one another's queries through the forum, both before class and afterward. I will read all submissions before class and use them as a basis for discussion that day when we gather as a group.

Participation in discussion, both online and in class, counts half of your grade for the course. This includes your supplemental report.

The Supplemental Report

In selected weeks, a student or pair of students will provide reports on supplementary readings pertaining to the assigned topic. These will be brief oral reports of approximately ten minutes designed to bring additional material and ideas before the group. Students should be prepared to present their report at any time during the class period, as the moment arises in the course of discussion.

The Term Paper

All HTS seminar courses require significant term papers grounded in original research. These papers should be of substantial length: approximately 25 double-spaced typed pages with modest margins. They mush be fully documented with footnotes or endnotes and a bibliography of works consulted. They must be original work written in your own words based on research in multiple resources.

These papers provide you with an opportunity to push beyond material covered in class. You may wish to pursue a topic raised in class much more fully, or you may take off on a different tangent that we have neglected in class. You may, for instance, use the paper to consider user communities and the impact of computing upon a sector of society. Or you may choose to examine communities of technicians and examples of technical change occurring outside the realm of computing. The only requirements are that your topic pertains to the time period covered by the course, involves computing or another area of technical innovation, is primarily historical in nature, and is approved well in advance by Professor Usselman.

This is not the sort of assignment you can fulfill during a frantic push at the end of the term. You need to identify a topic early during the term and begin your research promptly. You will submit a draft of your paper several weeks before the end of the term for subsequent revision.

During the final meetings of the course, we will hear student presentations on their papers. I will provide more details on these presentations as the term proceeds. The paper and presentation together count half of your total grade for the course.

CLASS SCHEDULE

1/6 Organizational Meeting
Readings Due: None

1/13 Thinking About Innovation and Environment
Readings Due:
Kaplan, Silicon Boys, Prologue (optional) and Ch. 1
Kenney, Understanding SV, Ch. 1 (Sturgeon)
Saxenian, Regional Advantage, Intro and Ch. 1

1/20 Early Computing
Readings Due:
Ceruzzi, History of Modern Computing, Ch. 1-3
Edwards, The Closed World, Ch. 2 and 3 (available on web)
Hughes, “Funding a Revolution” (available on web)
Usselman, “IBM and Its Imitators” (available on web)

1/27 Universities, especially Stanford
Readings Due:
Rosenberg and Nelson, “The Role of Universities” (available on web)
Kaplan, Ch. 2
Leslie and Hevly, “Steeple Building” (available on web)
Leslie and Kargon, “Science Regions and Research” (available on web)
Kenney, Ch. 2 (Leslie)
Lowood, “From Steeples to” (available on web)
O’Mara, “City of Knowledge” (available on web)

2/3 What about GT and Atlanta?
Readings Due:
O’Mara, “Selling the New South” (available on web)
Combes, “Case Study of Micromeritics” (available on web)
Excerpts from History of Georgia Tech

2/10 Case Study: The Chip
Readings Due:
Misa, “From Military Necessity to Commercial Reality” (available on web)
Leslie, “Material Science” and “Pentagon West” (available on web)
Kaplan, Ch. 3
Berlin, “Robert Noyce and Fairchild” (available on web)
Ceruzzi, Ch. 6
Wolfe, “Tinkerings of Robert Noyce”(available on web)
Lecuyer, “Revolution in Silicon”(available on web)
Lecuyer, “Silicon for Industry” (available on web)
Riordan and Hoddeson, “Moses of Silicon Valley” (available on web)

2/17 Individual Meetings with Professor Usselman to Review Paper Proposals
Readings Due: None, but proposals due by11:00 a.m.

2/23 Minicomputer World I
Readings Due:
Ceruzzi, Ch. 4 and 5
Kidder, Soul of a New Machine, all

3/2 Minicomputer World II
Readings Due:
Ceruzzi, Ch. 8
Hughes, “Funding a Revolution” (available on web)
Hiltzik, Dealers in Lightning, through Ch. 20
Englebart, “Augmenting Human Intellect” (available on web)

3/9 NO CLASS – SPRING BREAK

3/16 PC World
Readings Due:
Ceruzzi, Ch. 7 (and review Ch. 8)
Hiltzik, Ch. 21-25 and Epilogue
Kaplan, Ch. 4 and 5

3/23 Workstations and “Open Systems”
Readings Due:
Ceruzzi, Ch. 9
Saxenian, Ch. 2 through Conclusion
Bhide, “Sun Microsystems Case” (available on web)

3/30 Intermediaries as Agents
Readings Due:
Kaplan, Ch. 6 and 7
Kenney, Ch. 4 through 7
Hughes, “Funding a Revolution” (available on web)
Saxenian, “New Immigrant Entrepreneurs” (available on web)

4/6 Reprise: Explaining Silicon Valley
Readings Due:
Kenney, Foreword and Ch. 8-10
Victor and Ausubel, “DRAMs as Model Organisms” (available on web)
Miller, “Habitat of High Technology Regions” (available on web)

4/13 New Ventures in a Digitized World
Readings Due:
Kaplan, Ch. 8-10 and Epilogue
Ceruzzi, Ch. 10
Buderi, “Intel and Microsoft” (available on web)

4/20 Presentations by Students

4/26 (11:30-2:30) Presentations by Students