HTS 6118: Science, Technology, and the Economy

Course Description (for catalog):
Examines how science and technology are related to economic institutions and processes.

Abbreviated title: SCI TECH AND THE ECONOMY

Potential instructors: Damarin, Winders, Usselman

This course will examine intersections between science, technology, and major dimensions of the modern economic world, including organizations, industries, work, exchange, distribution, valuation, consumption, and overall growth and decline. Throughout, the roles of efficiency, power, agency, inequality, coordination, uncertainty, symbols, and norms will be considered. Readings and theoretical approaches are drawn from the sub-disciplines of sociology of science and technology, economic sociology, sociology of work and employment, and organizational sociology, and also cross disciplinary boundaries by engaging with history, business scholarship, economics, and anthropology. Traditional social scientific approaches, critical theory, and postmodern perspectives will be considered.

Course Requirements

Readings and Participation (20%): Read all of the selections listed for each week prior to class (in the order listed) and come prepared to discuss them. I have not provided "recommended" readings; if a topic piques your interest, I'd be happy to suggest more material.

Written Responses (15%): During the course of the semester you will turn in ten written responses to the weekly readings, due at the end of the class in which the readings are discussed. It is up to you to decide which weeks to write and which to skip. Responses should be typed, double-spaced, and approximately 2 pages; they should offer commentary, analysis, critique, or questions concerning one or more of the readings (avoid mere summarizing). Two possible strategies for responses include: (1) compare two or more readings in terms of a major theme or question, perhaps one engaged in class; (2) evaluate one or more of the readings in terms of its usefulness for understanding an empirical phenomenon, e.g. some aspect of your research or a problem or event of interest.

Serving as Discussant (10%): Discussants are synthesizers and instigators. The synthesis role involves drawing connections (or pointing out disconnects) among the various readings; the instigator role involves providing thought-provoking commentary, critique, and questions about some or all of the readings. Prepare a short presentation (approximately 5 minutes synthesis, 5 minutes instigation) to offer at the beginning of class; then conversation will be opened to the group. Please see me after class the week before you present in order to receive guidance on the overall reading assignment; in addition, feel free to contact me at any time during the week prior to your presentation if you have questions or need a sounding board.

Paper (50%) and Presentation (5%): The default assignment for this semester-long project is to write a research paper of 15-25 pages (excluding bibliography) that includes—but is not limited to—works and/or themes considered in the class. However, students who are interested in

incorporating perspectives from this class into their current or future research may propose alternate project formats (e.g., part of a masters' thesis, a draft grant proposal or dissertation proposal). Please note that proposals for alternative projects must be made in writing—including a paragraph outlining your thesis or question, a rough outline, and a partial bibliography—no later than the tenth week of class. On the last day of class you will give a 10-15 minute presentation on your project and offer comments on presentations from the rest of the group. Papers are due on the Monday following the last day of class. Late papers will be docked 1/3 of a letter grade (the equivalent of a "plus" or "minus") and will not be accepted after 4:00 pm on the Wednesday of the same week.

Miscellaneous: You are expected to adhere to the Georgia Tech Honor Code; if you are uncertain about how the code applies to this course, ask. The honor code can be found at: http://www.deanofstudents.gatech.edu/integrity/policies/honor_code.html
I am happy to work with the ADAPTS office to accommodate students requiring consideration due to a disability. Information about the ADAPTS office can be found at: http://www.adapts.gatech.edu

Readings

The schedule below includes maximal lists of readings. Each week I will announce which are required, which are recommended and, in some cases, additional readings for the next week's class.

Readings are available on T-Square. If you have any difficulty securing them please email me at once so I can resolve the situation for you and the rest of the class.

Schedule of Classes and Assignments

I. INTRODUCTION

Week 1 **Introduction to the Class**

Week 2 **Economic Issues in Economic and Sociological Perspective**

Economic Views

Adam Smith. 1776. *The Wealth of Nations.* [excerpts]

W. Stanley Jevons. 1871. *The Theory of Political Economy.* [excerpts]

Joseph A. Schumpeter. 1942. *Capitalism, Socialism and Democracy.* [excerpts]

F. A. Hayek. 1944. *The Road to Serfdom.* [excerpts]

David Hyman. 1993. *Modern Microeconomics.* Ch. 1.

Sociological Views

Karl Marx. "Economic and Philosophical Manuscripts" (1844) and "Wage Labour and Capital" (1849).

Max Weber. 1905. *The Protestant Ethic and the Spirit of Capitalism.* [excerpts]

Karl Polanyi. 1944. *The Great Transformation.* [excerpts]

Paul Hirsch et al., 1987. "'Dirty Hands' Versus 'Clean Models': Is Sociology in Danger of Being Seduced by Economics?" *Theory and Society* 16(3): 317-336.

Recommended, esp. for non-HTS students: Sociology of Science and Technology

Thomas J. Misa. 1988. "How Machines Make History, and How Historians (And Others) Help Them to Do So." *Science, Technology & Human Values*, 13 (3/4): 308-331.

Trevor J. Pinch & Wiebe E. Bijker. 1987. "The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other." In W.E. Bijker, T.P. Hughes, and T.J. Pinch (Eds.), *The Social Construction of Technological Systems*, 17-50. MIT Press.

Hans K. Klein & Daniel Lee Kleinman, "The Social Construction of Technology: Structural Considerations." *Science, Technology & Human Values,* 27 (1): 28-52.

Week 3 **Science, Technology, and Economic Growth**

Powell, Walter W. and Kaisa Snellman. 2004. "The Knowledge Economy." *Annual Review of Sociology* 30:199-220.

Parayil, G. (2005). The digital divide and increasing returns: Contradictions of informational capitalism. *The Information Society 21*, 41-51.

(Additional readings TBA)

II. SCIENCE, TECHNOLOGY, AND PRODUCTION

Week 4 **Technology, Efficiency, and the Rise of the Corporation**

Alfred D. Chandler, Jr. 1984. "The Emergence of Managerial Capitalism." *Business History Review* 58: 473-503.

Alfred D. Chandler, Jr. 1977. *The Visible Hand.* Harvard University Press. Ch. 1.

Oliver E. Williamson. 1981. "The Economics of Organization: The Transaction Cost Approach." *American Journal of Sociology* 87 (3): 548-577.

Donald Roy. 2001. "Functional and Historical Logics in Explaining the Rise of the American Industrial Corporation." In Mark Granovetter & Richard Swedberg (Eds.), *The Sociology of Economic Life*, Second Edition. Westview Press.

Charles Perrow. 1981. "Markets, Hierarchies and Hegemony." Pp. 371-386 in *Perspectives on Organization Design and Behavior*, edited by A.H. Van De Ven and W.F. Joyce. John Wiley and Sons.

Meyer, John W. and Brian Rowan. 1991. "Institutionalized Organizations: Formal Structure as Myth and Ceremony." Pp. 41-62 in *The New Institutionalism in Organizational Analysis*, edited by W.W. Powell and P.J. DiMaggio. University of Chicago Press.

Frank Dobbin. 2001. "Why the Economy Reflects the Polity: Early Rail Policy in Britain, France, and the United States." In Mark Granovetter & Richard Swedberg (Eds.), *The Sociology of Economic Life*, Second Edition. Westview Press.

Week 5 **Technology, Labor, and Skill**

Harry Braverman. 1974. *Labor and Monopoly Capital.* New York: Monthly Review Press. [excerpts]

David Noble. 1979. "Social Choice in Machine Design: The Case of Automatically Controlled Machine Tools." In Donald MacKenzie and Judy Wajcman (Eds.), *The Social Shaping of Technology*, 2nd Ed., pp. 161-176. Open University Press.

Sally L. Hacker. 1979. "Sex Stratification, Technology and Organizational Change: A Longitudinal Case Study of AT&T." *Social Problems* 26 (5): 539-557.

Milkman, R. (1997). *Farewell to the factory.* University of California Press. [excerpts]

Julian E. Orr. 1996. *Talking About Machines: An Ethnography of a Modern Job.* Cornell University/ILR Press. [excerpts]

Stephen R. Barley & Julian E. Orr. 1997. *Between Craft and Science: Technical Work in U.S. Settings.* Cornell University/ILR Press. [selected chapters]

Fernandez, R. M. (2001). Skill-biased technological change and wage inequality: Evidence from a plant retooling. *American Journal of Sociology 107* (2), 273-320.

Autor, D. H., Levy, F., & Murnane, R. J. 2002. "Upstairs, downstairs: Computers and skills on two floors of a large bank." *Industrial and Labor Relations Review 55* (3), 432-447.

Head, Simon. 2003. *The New Ruthless Economy.* Oxford University Press. [excerpts]

Week 6 **Science and Technology Labor Markets, Employment, and Careers**

Smith, Vicki. 2001. *Crossing the Great Divide.* Cornell University/ILR Press. [selected chapters]

Barley, Stephen R. & Gideon Kunda. 2004. *Gurus, Hired Guns, and Warm Bodies.* Princeton: Princeton University Press. [selected chapters]

S. O'Mahony & B.A. Bechky. 2006. Stretchwork: Managing the career progression paradox in external labor markets. *Academy of Management Journal 49*(5), 918-941.

Osnowitz, Debra. 2006. "Occupational Networking as Normative Control: Collegial Exchange Among Contract Professionals." *Work and Occupations* 33(1):12-41.

Robert K. Merton.1968. "The Matthew Effect in Science." *Science* 159 (3810): 56-63.

Mary Frank Fox. 1991. "Gender, Environmental Milieu, and Productivity in Science." In H. Zuckerman, J. R. Cole, and J. T. Bruer (Eds.), *The Outer Circle: Women in the Scientific Community*, pp. 188-204. WW. Norton.

Laurel Smith-Doerr. 2004. "Flexibility and Fairness: Effects of the Network Form on Organization on Gender Equity in Life Science Careers." *Sociological Perspectives* 47 (1): 25-54.

Susantha Goonatilake. 1993. "Modern Science and the Periphery: The Characteristics of Dependent Knowledge." In S. Harding (Ed.), *The 'Racial' Economy of Science*, pp. 259-267.

Week 7 **Inside High Tech Firms: Creativity, Tension, Legitimacy, Control**

Brown, John Seely and Paul Duguid. 2001. "Creativity Versus Structure: A Useful Tension." *MIT Sloan Management Review*, Summer, pp. 93-94.

Girard, Monique and David Stark. 2002. "Distributing Intelligence and Organizing Diversity in New-Media Projects." *Environment and Planning A* 34:1927-1949.

Casper, Monica J. 1998. *The Making of the Unborn Patient: A Social Anatomy of Fetal Surgery.* New Brunswick, NJ: Rutgers University Press.

Kunda, Gideon. 1992. *Engineering Culture: Control and Commitment in a High-Tech Corporation.* Temple University Press. [excerpts]

Smith-Doerr, Laurel. 2005. "Institutionalizing the Network Form: How Life Scientists Legitimate Work in the Biotechnology Industry." *Sociological Forum* 20(2):271-299.

Suchman, Lucy and Libby Bishop. 2000. "Problematizing 'Innovation' as a Critical Project." *Technology Analysis & Strategic Management* 12(3):328-333.

Week 8 **Technology Innovation and Adoption by Organizations**

Barley, S. R. 1986. Technology as an occasion for structuring: Evidence from observations of CT scanners and the social order of radiology departments. *Administrative Science Quarterly 31*, 78-108.

Zetka, J. R. Jr. 2001. Occupational divisions of labor and their technology politics: The case of surgical scopes and gastrointestinal medicine. *Social Forces 79* (4), 1495-1520.

Frickel, Scott. 2004. "Building an Interdiscipline: Collective Action Framing and the Rise of Genetic Toxicology." *Social Problems* 51(2):269-287.

Novek, J. 2002. IT, gender, and professional practice: Or, why an automated drug distribution system was sent back to the manufacturer. *Science, Technology & Human Values 27* (3): 379-403.

Vallas, S. P. (2001). Symbolic boundaries and the new division of labor: Engineers, workers, and the restructuring of factory life. *Research in Social Stratification and Mobility 18*, 3-37.

Week 9 **High Tech Industries as Networks**

Mark Granovetter. 1985. "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91(3): 481-510.

Podolny, Joel M. and Karen L. Page. 1998. "Network Forms of Organization." *Annual Review of Sociology* 24:57-76.

Powell, Walter W., Kenneth W. Koput, and Laurel Smith-Doerr, 1996. "Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology." *Administrative Science Quarterly* 41(1): 116-145.

AnnaLee Saxenian. 2001. "Inside-Out: Regional Networks and Industrial Adaptation in Silicon Valley and Route 128." In Mark Granovetter & Richard Swedberg (Eds.), *The Sociology of Economic Life*, Second Edition. Westview Press.

O'Riain, Sean. 2000. "Net-Working for a Living: Irish Software Developers in the Global Workplace." Pp. 175-202 in *Global Ethnography*, edited by Michael Burawoy. Berkeley: University of California Press.

Grabher, Gernot. 2004. "Learning in Projects, Remembering in Networks? Communality, Sociality, and Connectivity in Project Ecologies." *European Urban and Regional Studies* 11(2):103-123.

Indergaard, Michael. 2004. *Silicon Alley: The Rise and Fall of a New Media District.* New York: Routledge. Ch. 3.

III. EXCHANGE AND DISTRIBUTION

Week 10 **Distribution And Innovation**

Everett M. Rogers. 1995. *Diffusion of Innovations*, 4th Ed. Free press. [excerpts]

Wiebe E. Bijker. 1992. "The Social Construction of Fluorescent Lighting, or How an Artifact Was Invented in Its Diffusion Stage." In W. E. Bijker & J. Law (Eds.), *Shaping Technology, Building Society: Studies in Sociotechnical Change*. MIT Press.

W. Bernard Carlson. 1992. "Artifacts and Frames of Meaning: Thomas A. Edison, His Managers, and the Cultural Construction of Motion Pictures." In W. E. Bijker & J. Law (Eds.), *Shaping Technology, Building Society: Studies in Sociotechnical Change*. MIT Press.

Ruth Schwartz Cowan. 1985. "How the Refrigerator Got its Hum." Pp. 202-218 in *The Social Shaping of Technology*, D. MacKenzie and J. Wajcman (Eds.). Open University Press.

David, Paul A. 1985. "Clio and the Economics of QWERTY." *American Economic Review* 75(2):332-337.

Garud, Raghu, Sanjay Jain, and Arun Kumaraswamy. 2002. "Institutional Entrepreneurship in the Sponsorship of Common Technological Standards: The Case of Sun Microsystems and Java." *Academy of Management Journal* 45(1):196-214.

Djelic, M.-L., & Ainamo, A. 2005. The telecom industry as cultural industry? The transposition of fashion logics into the field of mobile telephony. *Research in the Sociology of Organizations 23*, 45-80.

Week 11 **Technologies of Valuation**

Wendy Nelson Espeland and Mitchell L. Stevens. 1998. "Commensuration as a Social Process." *Annual Review of Sociology* 24: 313-343.

Biggart, Nicole Woolsey and Thomas D. Beamish. 2003. "The Economic Sociology of Conventions: Habit, Custom, Practice, and Routine in Market Order." *Annual Review of Sociology* 29: 443-464.

Laurent Thevenot. 1984. "Rules and Implements: Investment in Forms." *Social Science Information* 23(1): 1-45.

Jean Lave. 1986. "The Values of Quantification." In J. Law (Ed.), *Power, Action, and Belief: A New Sociology of Knowledge?* Routledge.

Wendy Nelson Espeland & Michael Sauder. 2007. "Rankings and Reactivity: How Public Measures Recreate Social Worlds." *American Journal of Sociology* 113(1): 1-40.

Week 12 **Science, Technology, and Finance**

Mitchel Y. Abolafia. 1996. *Making Markets*. Harvard University Press. Ch. 1.

Karin Knorr Cetina & Urs Bruegger. 2002. "Global Microstructures: The Virtual Societies of Financial Markets." *American Journal of Sociology* 107(4): 905-950.

Donald MacKenzie. 2003. "An Equation and its Worlds: Bricolage, Exemplars, Disunity and Performativity in Financial Economics". *Social Studies of Science* 33 (6): 831–868.

Donald MacKenzie & Yuval Millo. 2003. "Constructing a Market, Performing Theory: The Historical Sociology of a Financial Derivatives Exchange." *American Journal of Sociology* 109 (1): 107–145.

Daniel Beunza & David Stark. 2004. "Tools of the Trade: The Socio-technology of Arbitrage in a Wall Street Trading Room." *Industrial and Corporate Change*; 13 (2): 369–400.

Ian Hardie & Donald MacKenzie. 2007. "Constructing the Market Frame: Distributed Cognition and Distributed Framing in Financial Markets." *New Political Economy* 12(3):389-403.

V. CONSUMPTION

Week 13 **Consumer Reception of Science/Technology Products**

Akrich, Madeleine. 1992. "The De-Scription of Technical Objects." Pp. 205-224 in *Shaping Technology/Building Society*, edited by Wiebe E. Bijker and John Law. MIT Press.

Ruth Schwartz Cowan. 1999. "The Industrial Revolution in the Home." Pp. 281-300 in *The Social Shaping of Technology*, D. MacKenzie and J. Wajcman (Eds.). Open University Press.

Kathleen Franz. 2004. "'The Open Road': Automobility and Racial Uplift in the Interwar Years." Pp. 131-153 in *Technology and the African-American Experience*, B. Sinclair (Ed.). MIT Press.

Baudrillard, Jean. 1983. *Simulacra and Simulations*. Semiotext(e), [excerpts].

Additional readings TBA.

Week 14 **End-Users as Inventors**

Paul Ceruzzi.1999. "Inventing Personal Computing." Pp. 64-86 in *The Social Shaping of Technology*, D. MacKenzie & J. Wajcman (Eds.). Open University Press.

Eric Von Hippel. 2001. "Innovation by User Communities: Learning from Open-Source Software." *MIT Sloan Management Review*, Summer, pp. 82-86.

K. R. Lakhani & E. von Hippel. 2003. How open source software works: "Free" user-to-user assistance. *Research Policy, 32*(6), 923-943.

Siobhán O'Mahony. 2003. "Guarding the Commons: How Community Managed Software Projects Protect Their Work," in *Research Policy,* 32: 1179-1198.

Additional readings TBA

Week 15 **Wrap-Up and Presentations**