INFO 700 – Principles of Scientific Inquiry in Business – Fall 2004

Syllabus

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The course "Principles of Scientific Inquiry in Business" is required for all PhD students in the School of Business. Its purpose is to provide support to each student in his or her own development of an understanding of the basic principles of science pertinent to business-school research. This course examines "science" construed as positivism, interpretivism, action research, and design science. A common theme across these diverse notions of science is how the perspective of the university-based researcher is distinct from the perspective of the everyday people (managers, analysts, executives, clerical staff) whom the researcher observes, where the former perspective is not better or worse than the latter but strives to "add value" through the different goals that it seeks to achieve.

One emphasis in the course is the philosophical foundations of scientific inquiry. Scientific research that employs statistical methods can be scientific, but it is not the statistical methods that make the research scientific. One may judge a specific instance of qualitative research to be scientific or unscientific; however, in the latter case, it is not the lack of mathematical, statistical, or quantitative elements that renders the research unscientific. A grasp of the philosophical foundations of scientific inquiry will help one to determine if a given research study (including one's own) is scientific or not, regardless of its outward appearance.

Another focus in the course is qualitative methods, which MGMT 701 (the second course in this sequence) complements with an emphasis on quantitative research. The quantitative-qualitative distinction is actually less important than the underlying principles of science, which cut across any quantitative-qualitative boundaries.

The weekly seminar format consists of collegial discussions. Usually, a student is required to write a paper just every other week. Each week, three students (out of the total of six students in INFO 700 this semester) will write papers answering questions designated for them and will e-mail their papers to allenslee@alum.mit.edu so that the papers will be received by noon of the day preceding the seminar. By 2pm, these papers will be forwarded to the entire class. All students are expected to read these papers as well as the assigned readings.

Because all the students in the course in this semester are information systems students, the readings will focus on information systems research.

The VCU Honor System applies to all students at VCU. A statement of it is available at < http://www.vcu.edu/provost/univ_policies/honor.htm>. It defines plagiarism as

"[r]epresenting orally or in writing, in any academic assignment or exercise, the words, ideas, or works of another as one's own without customary and proper acknowledgment of the source." It also defines and describes other violations of the VCU Honor System.

A student's grade for the course will depend on class participation (25%) and the six paper grades (12.5% each). After being graded, no paper may be revised for a higher grade. There will be no exams. There will be no projects.

WEEKLY SEMINAR TOPICS AND READINGS

1 1 September 2004

An Introduction to the Course

An Introduction to the Research Publication Process

Allen S. Lee & Richard L. Baskerville, "Generalizing Generalizability in Information Systems Research," *Information Systems Research*, (14:3), 2003, pp. 221-243.	The statistical notion of generalizability, which associates generalizability with a large sample size, is only a subset of, in turn, just one of four types of generalizability. Lee and Baskerville's analysis of generalizability also conveniently provides us with an introduction to some basic philosophical concepts in scientific inquiry.
Documents related to the publication process of "Generalizing Generalizability in Information Systems Research."	Doing good research is one thing; publishing it is quite another. These documents provide a detailed, and painful, account of the events involved in the actual publication of a paper.

2 8 September 2004

Induction and Deduction in the Logic of Science

Allen S. Lee, "Thinking about Social Theory and Philosophy for Information Systems," *Social Theory and Philosophy for Information Systems*, John Mingers and Leslie Willcocks (eds.), John Wiley & Sons, 2004, pp. 1-26.	Lee walks the reader through basic philosophical concepts in scientific inquiry and points out the difference they make in the context of information systems research.
Karl R. Popper, "On the Sources of Knowledge and Ignorance," introduction to *Conjectures and Refutations: The Growth of Scientific Knowledge*, New York: Harper Torchbooks, 1968, pp. 3-30.	Popper provides good, easy-to-understand examples of research that is not empirically testable ("falsifiable"), where the examples pertain to the research of Marx, of Freud, and of Adler.
Irving M. Copi, "Explanations: Scientific and Unscientific," in *Introduction to Logic*, London: Collier Macmillan, 1986, pp. 482-487.	Copi's textbook on formal logic provides a succinct characterization of the logic of empirical science.

POSITIVIST RESEARCH

3 15 September 2004

Positivist Research: Laboratory Experiments and Statistical Experiments

Ernest Nagel, *The Structure of Science*, Indianapolis: Hackett Publishing, 1979, pp. 450-459.	Nagel illuminates exactly what it is that scientific experiments are supposed to do.
Donald T. Campbell & Julian C. Stanley, *Experimental and Quasi-Experimental Designs for Research*, Boston: Houghton Mifflin, 1963, pp. 1-33.	This book is a classic in applying the notion of scientific experimentation in social science. The 33 pages are dense, but worth studying in detail. More recent is *Quasi-Experimentation: Design & Analysis Issues for Field Setting*, by Thomas D. Cook and Donald T. Campbell (Boston: Houghton Mifflin, 1979).
Alan R. Dennis, Kelly M. Hilmer, and Nolan J. Taylor, "Information Exchange and Use in GSS and Verbal Group Decision Making: Effects of Minority Influence," *Journal of Management Information Systems*, (14:3), 1998, pp. 61-88.	Dennis, Hilmer, and Taylor provide a good illustration of a typical experiment in information systems research.

4 22 September 2004

Hands-on work with electronic research databases

5 29 September 2004

Positivist Research: Natural Experiments and Case Studies

Rosabeth Moss Kanter, *Men and Women of the Corporation*, New York: Basic Books, 1977. Try to read the entire book, but be sure to cover the following parts: "Introduction" (pp. 3-11), "Secretaries" (pages 69-103), "Contributions to Theory: Structural Determinants of Behavior in Organizations" (pp. 245-265), and "Appendix I: Field Study Methodology and Sources of Data" (pp. 331-338).	Women students with corporate experience who have taken this course agree that Kanter's study on the status and situation of women in corporations, published in 1977, remains timely. It is also an example of beautifully executed field research. It has both positivist and interpretive elements.
Allen S. Lee, "Case Studies as Natural Experiments," *Human Relations* (42:2), 1989, pp. 117-137.	There are many forms of experiments, such as laboratory experiments, statistical experiments, and natural experiments. Nagel's characterization of experiments pertains to them all. Lee reconstructs Kanter's field study as a natural experiment.

M. Lynne Markus, "Power, Politics, and MIS Implementation," *Communications of the ACM* (26:6), June 1983, pp. 430-444.	Markus' classic article in information systems research continues to be highly cited.
Allen S. Lee, "A Scientific Methodology for MIS Case Studies," *MIS Quarterly* (13:1), 1989, pp. 33-50.	Lee provides an overview of the main features of what positivist researchers would consider to be scientific research. Lee reconstructs Markus's field study as a scientifically conducted case study.

6 6 October 2004

Positivist Research – Yin's Case Study Method

Robert K. Yin, *Case Study Research*, Newbury Park, CA: Sage Publications, 1994 or 2002.	Practically all information systems researchers consider this to be a "must read" book, including those who do not do qualitative research.

INTERPRETIVE RESEARCH

7 13 October 2004

Interpretive Research – Social Construction of Reality

Allen S. Lee, "Researching MIS," in *Rethinking Management Information Systems: An Interdisciplinary Perspective*, New York: Oxford University Press, 1999, edited by Wendy L. Currie and Bob Galliers, pp. 7-27.	Lee describes positivist research and interpretive research, including how they differ from each other.
Peter L. Berger and Thomas Luckmann, *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*, Garden City, NY: Anchor Books, 1966.	Many published information systems research articles use the terms "socially constructed" as if it were a synonym for "subjective"; however, according to Berger and Luckmann (whose book popularized this and similar terms), socially constructed realities are also objective.
Allen S. Lee, "Electronic Mail as a Medium for Rich Communication: An Empirical Investigation Using Hermeneutic Interpretation," *MIS Quarterly* (18:2), 1994, pp. 143-157.	On pages 149, 150, and 151, Lee offers a succinct characterization of what a socially constructed reality is.
Alfred Schutz, "Concept and Theory Formation in the Social Sciences," in *Collected Papers,* The Hague: M. Nijhoff, 1962-66, pp. 48-66.	Most doctoral students consider this article dense and difficult to read. Making the article worthwhile are two important distinctions that Schutz makes: "first level constructs" *vs.* "second level constructs" and the "natural attitude of everyday life" *vs.* the "scientific attitude."

8 & 9 20 & 27 October 2004

Interpretive Research – Ethnography

Fred O. Gearing, *The Face of the Fox*, Salem, Wis.: Sheffield Publishing, 1988.	Gearing's short and nifty book conveys the essential features of ethnographic research.
Helen B. Schwartzman, *Ethnography in Organizations*, Beverly Hills, CA: Sage Publications, 1993.	Schwartzman provides us with one of those books that captures, all in one place, most of the essentials you need to know about an important topic (in this case, ethnography).
Ulrike Schultze, "A Confessional Account of an Ethnography About Knowledge Work," *MIS Quarterly* (24:1), March 2000, pp. 3-41.	This is a well executed and highly cited ethnographic study in the information systems field.
Rosabeth Moss Kanter, *Men and Women of the Corporation*, New York: Basic Books, 1977. Try to read the entire book, but be sure to cover the following parts: "Introduction" (pp. 3-11), "Secretaries" (pages 69-103), "Contributions to Theory: Structural Determinants of Behavior in Organizations" (pp. 245-265), and "Appendix I: Field Study Methodology and Sources of Data" (pp. 331-338).	Previously assigned, week 5.

10 3 November 2004

Interpretive Research – Hermeneutics

Richard J. Boland, Jr., "Information Systems Use as a Hermeneutic Process, in *Information Systems Research: Contemporary Approaches & Emergent Traditions*, H.-E. Nissen, H.K. Klein, and R. Hirschheim (eds.), North Holland, New York, NY, 1991, pp. 439-458.	Boland shows that accounting data – just numbers in a report – can open up the entire world of a socially constructed reality. His study also provides excellent material for the enduring question about the difference between data and information.
Allen S. Lee, "The Hermeneutic Circle as a Source of Emergent Richness in the Managerial Use of Electronic Mail," *Proceedings of the International Conference on Information Systems*, Janice I. DeGross, Sid L. Huff, and Malcolm C. Munro (eds.), Vancouver, 1994, pp. 129-140.	Lee illustrates the concept of the hermeneutic circle. Much, but not all, of the material in this paper appears in the next reading.
Ojelanki K. Ngwenyama and Allen S. Lee, "Communication Richness in Electronic Mail: Critical Social Theory and the Contextuality of Meaning," *MIS Quarterly* (21:2), 1997, pp. 145-167. Co-author:	Without mentioning hermeneutics, Ngwenyama and Lee do a hermeneutic interpretation from a critical perspective.

Allen S. Lee, "Electronic Mail as a Medium for Rich Communication: An Empirical Investigation Using Hermeneutic Interpretation," *MIS Quarterly* (18:2), 1994, pp. 143-157.	Assigned previously, in week 7.

11 10 November 2004

Interpretive Research – Grounded Theory

Anselm L. Strauss and Juliet Corbin, *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*, Newbury Park, CA: Sage Publications, 1998, second edition. Concentrate on pages 3-56, 123-142, 265-274.	Strauss and Corbin provide a detailed explanation of their way of doing grounded-theory research. This book is highly cited.
Barney G. Glaser, *Emergence vs. Forcing: Basics of Grounded Theory Analysis*, Mill Valley, CA: Sociology Press, 1992, pages 1-10.	One of the two founders of grounded theory disagrees with the other.
Wanda J. Orlikowski, "CASE Tools as Organizational Change: Investigating Incremental and Radical Changes in Systems Development," *MIS Quarterly* (17:3), 1993, pp. 309-340.	Orlikowski uses grounded theory in her fieldwork on CASE tools.

DESIGN SCIENCE & ACTION RESEARCH: DOING, NOT JUST OBSERVING

12 17 November 2004

Design Science

Herbert Simon, *Sciences of the Artificial*, Cambridge, MA: MIT Press, 1981 or 1996.	This is another classic book that all doctoral students, but especially information systems doctoral students, should be familiar with.
Salvatore T. March and Gerald F.Smith, "Design and Natural Science Research on Information Technology," *Decision Support Systems*, (15:4), December 1995, pp. 251-266.	March and Smith provide a framework that serves as the foundation for the next article.
Alan R. Hevner, Salvatore T. March, Jinsoo Park, Sudha Ram, "Design Science in Information Systems Research," *MIS Quarterly* (28:1), March 2004, pp. 75-105.	Hevner, March, Park, and Ram lay out, in one place, the essential features of design science in information systems research.

Allen S. Lee, "Architecture as a Reference Discipline for MIS," in the book *Information Systems Research: Contemporary Approaches & Emergent Traditions*, edited by Hans-Erik Nissen, Rudy Hirschheim, and Heinz K. Klein, New York: Elsevier Science, 1991, pp. 573-592. Hardcopies will be made available.	The field of architecture does not neatly fit categories such as natural science, social science, engineering, art, and so forth. Lee argues the same for the field of (management) information systems, and shows how architecture and information systems both share design as a core and defining feature of what they are.

13 24 November 2004

Thanksgiving holiday. Every year, classes after 12pm on the Wednesday before Thanksgiving turn out to be canceled.

14 1 December 2004

Action Research

Richard L. Baskerville, "Investigating Information Systems with Action Research," *Communications of the Association for Information Systems*, Volume 2, Article 19, pp. 1- 32.	Baskerville conveys the essentials of action research.
Pär Mårtensson and Allen Lee, "Dialogical Action Research at Omega Corporation," *MIS Quarterly* (28:3), September 2004.	Mårtensson and Lee propose a very specific form of action research.

THE ROOTS OF SCIENTIFIC OBJECTIVITY IN THE SCIENTIFIC COMMUNITY

15 8 December 2004

Thomas S. Kuhn, *The Structure of Scientific Revolutions*, Chicago: University of Chicago Press, 1970.	All scholars in the natural and social sciences ought to read this book, and many (maybe most) have. Kuhn's book can be credited, or blamed, for popularizing the term "paradigm."

Schedule for Writing Papers

	Week														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Lewis Chasalow		x			x		x		x		x			x	
Roger Fong		x			x		x		x		x			x	
Mark Harris		x			x		x		x		x			x	
Long Li			x			x		x		x		x			x
Sushma Mishra			x			x		x		x		x			x
John Owens			x			x		x		x		x			x
Sumana Sharma			x			x		x		x		x			x

Every student should read all the assigned books, articles, and chapters, but priority should be given to those readings assigned in the weeks for which the student must write papers.