

CSE Curriculum Committee

Agenda Summary

April 19, 2011

Full agenda is on the web site: <http://www.aem.umn.edu/~shield/csecc/>

1. Approval of Dec. 7 2010 meeting Minutes – see web site.
2. Tentative Meeting Schedule for Fall 2011 and Spring 2012 -- watch web site:
 - a. Tuesday September 20, 2011 at 2:30
 - b. Tuesday December 6, 2011 at 2:30
 - c. Tuesday January 31, 2012 at 2:30
 - d. Tuesday April 17, 2012 at 2:30
3. Items for Information only (already approved in ECAS):
 - a. See web site
4. Items for Approval without Objection (already approved in ECAS):
 - a. BBE 4533: Agricultural Waste Management Engineering: Change title to Sustainable Waste Management Engineering
 - b. BBE 5404: Bio-based Composites Engineering: Change title to Biopolymers & Biocomposites Engineering
 - c. CSCI 5105: Foundations of Modern Operating Systems: change title to “Introduction to Distributed Systems” and changed description
 - d. EE 1301: Introduction to Computing Systems: change to concurrent prereqs.
 - e. EE 5393: Circuits, Computation & Biology: removal of STAT prerequisite
 - f. GEO 1007: Geobiology: Origin and Evolution of Life on Earth: New title: From Microbes to Mammoths
 - g. GEO 4801: Geobiology and Astrobiology: new title: Geomicrobiology, added prereq.
 - h. ME 5090: Advanced Engineering Problems: renumber to 4090
 - i. ME 5080: Topics in Mechanical Engineering: renumber to 4080
 - j. PHYS 4041: Computational Methods in the Physical Sciences: New courses – cross list of AST 4101
 - k. SENG 5707: Database Systems – title change effective fall 2008? – Query to originator
5. Action Items (new course syllabi are below or separate handouts):
 - a. AST 5001: Galactic Astronomy: New Course (see below)
 - b. BMEN 5412: Neuromodulation: New Course (see handout)
 - c. CHEN 4712: Rheology Laboratory Project: New Course (see below)

- d. CSCI 5117: Developing the Interactive Web: New Course (see below)
 - e. CSE 1001: First Year Experience: New Course (see below)
 - f. EE 2001/2011/3115 Changes (see handouts)
 - g. HSCI 3421/5421 Engineering Ethics: New Courses (see below)
 - h. MOT 4010: Middle East Seminar: New Course (see below)
 - i. MOT 5001 Leading Innovation Teams: New Course (see below)
- 6. New Business
 - 7. Adjourn

New Courses Syllabi

AST 5001: Galactic Astronomy

Credits: 3.0 to 3.0 credit(s)

Catalog Description: Galactic Astronomy will include a survey of the structure of the Milky Way galaxy, its stellar populations including open and globular clusters and the Solar neighborhood, and the formation and evolution of its structure. The course will also include an in-depth discussion of stellar distances and motions.

Course Prerequisites for Catalog: AST 2001 or graduate student.

Course goals: To familiarize beginning astrophysics graduate students and advanced undergraduate majors with the fundamental properties of our home galaxy, its formation and evolution, and its stellar populations.

Course format: Lectures plus oral presentations by students. Three lectures per week and no textbook so students will be expected to read current papers in the professional journals as assigned. Student workload will vary through the semester from 6-12 hours/week depending on assignments.

Topics: Large-scale structure of the Milky Way: Disk, Thick Disk, spiral structure, Halo and Galactic Center. Stellar populations; the importance of open and globular clusters, moving groups and star streams. The Solar neighborhood, stellar distances and motions, formation and evolution of the Milky Way and the role of galactic mergers.

Assignments: Will include problem sets, readings in professional journals and a term paper.

Student Evaluation: Problem sets will be graded for quantitative accuracy and insight into the solution. Oral talks will be graded on content, accuracy and familiarity with the literature. The term paper is the same as for talks.

CHEN 4712: Rheology Laboratory Project

Max-Min Credits for Course: 1.0 to 1.0 credit(s)

Catalog Description: **(524 characters – too long)**

Learn how to make rheological laboratory measurements. Students will select a rheologically interesting material with help of instructor and characterize it. Grade based on an oral and written report. This course is designed as a laboratory complement to CHEN 8102/4702 Principles and Applications of Rheology. Students should register concurrently (or have already taken) 8102/4702. Begins 2nd half of Spring Semester. One organizational meeting and oral presentations last week of semester in same time slot as 8102/4702.

Course Prerequisites for Catalog: 3005, &4702, instr consent

During the first half of the semester students will be enrolled in 8102 Principles and Applications of Rheology. Through 8102 lectures and through additional sessions in the rheology laboratory they will be introduced to the various rheometers and learn their operation. By mid semester they will determine the topic and scope of their project. They will meet with the instructor then turn in an abstract for the experimental rheology project the week before Spring break.

The project will include a description of the material(s) and the rheological material functions studied and why they were chosen. It will include some exploration of both linear and non-linear rheological phenomena. Students will schedule instrument time in the rheology laboratory in consultation with instructor.

Students will present orally results and their interpretation in terms of constitutive models and microstructural interpretation 14th week of semester. They will submit written report last week of semester.

CSCI 5117: Developing the Interactive Web

Max-Min Credits for Course: 3.0 to 3.0 credit(s)

Catalog Description: A hands-on design experience using modern web development tools. Students will work in teams to develop software programs using each of four toolkits. Students will analyze developments in forum posts and classroom discussions.

Course Prerequisites for Catalog: CSci 4131 or 5131 or #, Upper division UG or Grad in CSci recommended.

Developing The Interactive Web - 3 credit class. Taught in three 50minute periods or two 75minute periods.

Version 2.0 of the Web is radically changing the balance of power between desktop applications and thin client applications. The Web browser is becoming the de facto thin client, enhanced by client side programming environments that enable highly interactive applications. In this class we will study a collection of interactive Web toolkits, with the goal of examining many of the most important parts of the design space for these toolkits. We will gain an understanding of the strengths and weaknesses of the alternatives, so we are prepared to choose among them for applications we develop, to understand the evolutionary trends in the Interactive Web, and, for some students, to participate in developing the next generation of toolkits.

We will include systems like GoogleWeb Toolkit, Adobe Flex, Django/Dojo, and Facebook Apps. For each system we will study its architecture, develop a simple application and a more advanced application, study writings by critics and supporters, debate its advantages and disadvantages, and create a shared class resource that describes the system in-depth. Every student will know how to develop programs in all four frameworks, and will understand its strengths and weaknesses.

The primary way of learning in the class will be presentations, discussions, implementation, and design reviews. All students will present several times in front of the class.

Structure: The class will be structured in four segments of three weeks each. During each segment we will study one toolkit. We will have additional presentations on privacy, intellectual property, and other relevant issues.

The structure of each segment is:

Mini Launch

- *high-level presentation on the technology and its place in the world presentation by student "expert group"
- *who uses it, online resources, examples
- *walk-through of the mini-task
- *student groups plan their implementation

Maxi Launch

- *high-level presentation by the expert group on the task
- *work group brainstorming on ideas and questions for the project expert group members available for questions
- *full-class questions for the expert group
- *small group design meetings

Design Day

- *each group presents their working design discuss design issues in this task public questions about the task they're working on problems they see coming, and help from everyone
- *Extra Credit presentation on relevant class topic

Design Critique Day

- *presentation by demo group on their (very cool!) project, with special design critique by expert group
- *discussion by class
- *project work time

Industry Day

- *industry presentation
- *questions and discussion
- *project work time

Demo or Die!

maxi project presentations, by every group, 7 minutes each, including demo! 1 driver and 1 presenter, driver working from the table each group member must present at least one of the four projects

Analysis

[Instructor led]

- *Strengths

- *Weaknesses
- *Opportunities
- *Best Applications
- *General Discussion
- *Demo group updates technology guide based on all the discussion

Nature of the Workload:

There will be five types of graded activities:

1. The mini-project for each toolkit will be a brief introduction to the technology. Every group in the class will implement the same simple project. Groups will receive a "check" for successfully completing the project.
2. The maxi-project for each toolkit. Each group will develop a more sophisticated example application using the toolkit, and will demonstrate its application to the class. These projects will be graded based on the code developed and the presentation.
3. The expert or demo presentation. Each group will be responsible for one toolkit as "expert" or "demo" group. The expert group will prepare the tutorial, the mini-project, the discussion materials, and lead the critique of the demo group. The demo group will present a detailed presentation on the implementation of a demo project with the toolkit, and will prepare the final Web page comprising the class's analysis of the toolkit, based on the readings, forum posts and class discussion.
4. Each student will be responsible for required weekly forum postings discussing the toolkit. These postings will be structured, with a different goal for each of the three weeks of each toolkit.
5. Class participation. Students will be expected to actively attend and participate during all class periods.

This course will be taught entirely from resources available freely on the Web.

Grading: The weighting scheme used for grading is approximately: Toolkit Projects: 40%, Expert or Demo Tasks: 25%, Class Participation: 20%, Writing and Group work 15%.

CSE 1001 First Year Experience

Max-Min Credits for Course: 1.0 to 1.0 credit(s)

Catalog Description: Learning about resources and strategies for college success. Exploring majors and career opportunities offered in the physical sciences, mathematics and engineering. Understanding personal responsibility, academic integrity, and level of academic rigor required for success. Developing a personal action plan for achievement in CSE.

Course Prerequisites for Catalog: CSE Freshman

Course Catalog Description:

(1.0 cr; A-F only, fall every year, new freshman only; cannot be taken concurrently with CSE 1411 Exploring Careers in Science and Engineering)

Key outcomes: Learning about resources and strategies for college success. Exploring majors and career opportunities offered in the physical sciences, mathematics and engineering. Developing a personal action plan for success in CSE. Course will be team taught by members CSE student services, including the Student Programs Office, the Career Center for Science and Engineering, and the Academic Advising Office.

Structure:

Sections of up to 40 students will be taught by professional staff from CSE Student Services. The course will be structured in 2-week blocks: students will meet in class for 50 minutes in the first week of the block, followed by a required small group meetings in the second week. The second week may incorporate on-line materials as well as panel presentations on topics ranging from major and career exploration, preparing for international/global perspectives, involvement in student organizations, financing your education through scholarships and loans, and preparing for undergraduate research, internships, or cooperative learning.

Each section of 40 students will be divided into teams of approximately 5 students, which will form a study and exploration cohort for the semester. When practical, teams should be formed around cluster areas congruent with commonly selected CSE majors.

Course Objectives:

- * Connect students to colleges and campus-wide resources and services to aid in the development of strategies for academic success.
- * Develop an understanding of the different majors offered in CSE and gain exposure to career and industry opportunities
- * Assist in your transition to college by providing a small community for discovery and connection.
- * Gain an increased knowledge of various ways to get involved both on and off campus
- * Aid in your ability to think critically, plan for, and reflect on your college experience for growth as a student.

Final project: Personal action plan

HSCI 3421/5421 Engineering Ethics

Max-Min Credits for Course: 3.0 to 3.0 credit(s)

Catalog Description: This course covers engineering ethics in historical context, including the rise of professional engineering societies; ethical problems in engineering research and engineers' public responsibility; ethical implications of advanced engineering systems such as the production of nuclear weapons; and the development of codes of ethics in engineering.

HSci 3421/5421: ENGINEERING ETHICS
Course Proposal: Spring Semester 2012

3 credit hours

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COURSE DESCRIPTION AND OBJECTIVES

The history of engineering offers significant episodes for ethical analysis. This course presents topics such as the historical differentiation between scientific and engineering knowledge as exemplified in the works of Benjamin Franklin and the British engineer John Smeaton, and the relationship between technicians, engineers, and scientists in the early scientific academies. It examines ethical aspects of preindustrial technological societies, and surveys a variety of ethical systems based on engineering ideologies such as utilitarianism. It covers the development of engineering ethics and the rise of engineering societies; ethical problems in engineering research such as the role of public responsibility; ethical implications of advanced engineering systems, as experienced by the engineers involved in the production of nuclear weapons; and the development or codes of ethics in engineering. Students will take part in weekly small group discussions, and students from diverse backgrounds are welcome.

Engineering and technology are enormous forces in our society, and have become so important that in many ways they seem to have lives of their own. This course uses historical case studies to help students realize that engineering is not autonomous, but that it is a human activity, and that people and societies made choices about the types of engineering and technologies they developed and used. The course asks how technological developments influenced people's ethical ideas, and how people's ethical ideas influenced their choices of which technologies to invest in and develop. We ask how engineering choices often brought about consequences greater than people expected, and how we might use this knowledge in making our own technological choices. The overall objective of this course is to help students consider technology and engineering as human and historical forces, rather than technical and deterministic ones. The goal is to help students see that technological development results from human actions and human ethical choices, and that they themselves are in a position to make ethical choices that can influence the future course of technology.

COURSE FORMAT

This course uses lectures and in-class discussions, and weekly small-group meetings to discuss primary source materials. Students are assigned to standing small groups and are expected to attend all lectures and discussion group meetings, and to do assigned weekly readings.

DIFFERENCES BETWEEN HSci 3421 AND HSci 5421

Students registered in both levels are required to attend all lectures and discussion section meetings. The difference lies in the examinations and in the papers. HSci 3420 students must take all examinations and write an eight-page term paper; HSci 5420 students do not take the examinations and must write an 18-20 page research paper in conference with the instructor, on the historical background of a currently important issue in the ethics of science and technology. More details on assignments for both 3420 and 5420 students appear later in the syllabus.

LIBERAL EDUCATION CORE AND THEME REQUIREMENTS

Liberal Education

(omitted)

Historical Perspectives Core

(omitted)

Civic Life and Ethics Theme

(omitted)

LEARNING OUTCOMES

The University has offered specific learning outcome goals for undergraduate education, which have guided my expectations for student learning in this course. My learning expectations have also been influenced by the goals of the historical perspectives core and the civic life and ethics theme.

General Liberal Education Requirements Learning Outcomes

Communication skills will be modeled in discussion meetings, and by the instructor in lecture/seminar, and you will be required to participate in discussion in both venues. Lectures will model examples of how to identify, define, and solve historical problems, and teaching assistants will also provide such models involving the assigned texts and artifacts. Lectures in particular will model how to locate and critically evaluate information, by using a variety of sources and illustrating how a historian makes use of them, and which ones s/he decides are useful and which not. In lectures and discussion meetings we will also offer you examples of the wide scope of human ethical behavior, and give you the opportunity to consider ethical decisions yourself. You will find that even ethical concepts we now for granted were the objects of considerable disagreement at first.

Specific examples of how these outcomes will be taught follow.

You will learn to identify, define, and solve problems by learning to look beyond immediately apparent explanations. By analyzing the history of how developments in science and technology intersected with developments in civic life and ethical perspectives you will learn that the technical features of engineering and technology are not the only explanation of ethical conflicts about them. You will learn to identify other features of a situation that may be involved, and develop criteria for deciding which features are the critical ones that require further investigation.

You will learn to locate and critically evaluate information. By considering contradictory responses to science and technology by apparently reputable sources, concerning different views of the effect of global engineering on the environment, for example, you will learn to find different types of historical information, and to evaluate how authoritative and useful these different sources of information are.

You will learn to communicate effectively by required participation in classroom discussions and by writing a short paper with multiple drafts reviewed both by your student peers and by your instructors. The paper assignment asks you to analyze the communication of ethical concepts in three quite different publications, and asks how we may use our knowledge of the history of ethical approaches to science and technology to inform our opinions about ethical approaches to them in the present.

You will learn to understand the role of creativity, innovation, discovery and expression across disciplines by examining the many different disciplines that have contributed to an understanding of the role of engineering and technology in civic and public life. Examples of great ethical creativity that we will discuss include the wilderness ethic of Minnesota native Sigurd Olson and the new engineering vision of the first professional civil engineers.

Evaluation of student' general liberal education learning outcomes

We will keep track of your contributions to discussion in both the discussion sections and in lecture, and if you find it difficult to contribute we will find a way to open the conversation to you. As the term progresses, your comments should begin to use the methods of identifying, defining, and solving historical and ethical problems that have been modeled in lecture and discussion section. Questions on the essay examinations will evaluate how you make use of provided material to identify, define, and solve historical and ethical problems on your own, by asking you to make an argument about the historical past or about historians's interpretations of it. Other questions on the examinations will ask you to evaluate the usefulness and authority of both the primary and secondary materials to which you have been introduced. We will use your term papers (or, for 5420 students, your research papers) to evaluate how you have learned to locate and critically evaluate information.

Textbooks (required):

Ian Barbour, *Ethics in an Age of Technology: The Gifford Lectures* (Harper San Francisco, 1993)

James R. Chiles, *Inviting Disaster: Lessons from the Edge of Technology* (Harper Business, 2002)

The Dalai Lama, *Ethics for the New Millennium* (New York: Riverhead, 1999)

National Academy of Sciences, National Academy of Engineering, Institute of Medicine, *On Being A Scientist: A Guide to Responsible Conduct in Research* (Washington, DC: National Academies Press, 2009)

Ron Howard and Clint Corver, *Ethics for the Real World: Creating a Personal Code to Guide Decisions in Work and Life* (Cambridge, Mass.: Harvard Business Press, 2008).

Primary source course readings (required):

All but two of these readings are from primary sources. They are available on the course website, either as scans or via links posted there. You are required to carry a copy of the reading with you to discussion meetings.

- 1) Sir Francis Bacon, *Novum Organum* (1620, 1902 edition edited by Joseph Devey, (New York: P.F. Collier). Linked on WebVista to the OnLine Library of Liberty, Liberty Fund.
- 2) Jeremy Bentham, *An Introduction to the Principles of Morals and Legislation* (1781), selections. Linked on WebVista to www.utilitarianism.com
- 3) William Hogarth, *Industry and Idleness* (1747) engraved plates. Linked on WebVista to *Art of the Print*.
- 4) Thomas Henry Huxley, *Evolution and Ethics* (Pilot: London, 1893), selections. Linked on WebVista to *Gutenberg Project*.
- 5) Lynn White, *The Historical Roots of our Ecological Crisis*, *Science* 155 (1967): 1203-1207. Scanned and posted on WebVista. Please note that this is a secondary source, not a primary one.
- 6) George Gordon Byron, *Lord Byron Speech in Parliament in Opposition to the Death Penalty for Machine Breakers* (1812), reprinted in David F. Noble, *Progress Without People* (*Between the Lines*: Toronto, 1995), scanned and posted on WebVista.
- 7) Charles Darwin, *Origin of Species* (London: 1859, Harvard Press Facsimile Edition), Chapter one, *On Variation* Scanned on WebVista.
- 8) George Gaylord Simpson, *The Meaning of Evolution: A Study of the History of Life and its Significance for Man* (Yale University Press, 1967), Chapter 17, *The Search for an Ethic*. Scanned and posted on WebVista.
- 9) Paul Weindling, *The Uses and Abuses of Zyklon B*, *History of Technology* 11 (1994): 219-298. Scanned and posted on WebVista. Please note that this is a secondary source, not a primary one.
- 10) General Advisory Committee's Majority and Minority Reports on Building the H-Bomb (1951). Extracts linked on WebVista to WGBH primary reporting sources.
- 11) Edward Tufte, *Analysis of the visual evidence in the Space Shuttle Challenger Disaster*. Scanned online.
- 12) *Report on the Failure of I-35 in Minneapolis, Federal Highway Administration*. Scanned on-line.

GRADING

All of the following assignments must be satisfactorily completed in order to pass the course. Missing an assignment is a major problem, so if you anticipate any difficulties with scheduling, etc., please see me as early in the semester as possible. You must meet each deadline and do each assignment if you want to pass the course. Please note that attendance at discussions is required.

3421 students

Discussion 25%

Midterm 25%
Code of ethics 25%
Final 25%

5421 students

Discussion 25%
Midterm Examination 25%
Issue paper 25%
Final 25%

CODE OF ETHICS PAPER (3421 students)

You will prepare a 10-page paper defining a set of values, critiquing it in the light of course materials, and formulating a code of ethics. The values used should be drawn from your own personal value system. Your critique should be based upon the historical analysis of ethics presented in the course. The code of ethics should address issues in your own field of study. In your paper you should either locate or formulate such an issue and explain how your code of ethics may be applied in resolving it. Students are encouraged to discuss their problems with others, but each student should write their own essay, based upon their ethical values, as interpreted with the help of course materials. Sources of specific concepts, ideas or information should be cited and all quotes of more than four words must be cited. The paper will be due Friday, April 29.

Format: The term paper must be typed, double-spaced, on letter-sized paper (8.5" x 11"), with one-inch margins on all sides, using ten or twelve point type in Times New Roman or Ariel font. The pages should be numbered in the upper right-hand corner, and should be stapled together. You should not need to use footnotes, but if you do, please talk to me about how you want to format them. Please pay strict attention to the page limits, because longer and shorter papers are not acceptable. Please do use illustrations, which must be numbered and placed at the end of the paper. They do not count as part of the required number of pages.

5421 STUDENTS: RESEARCH PAPER

If you are taking the course for graduate credit, you should be registered in HSci 5421. You will be required complete an 18-20 page issue paper on the historical background of a currently important issue in the ethics of engineering and technology. You must choose the issue and develop a reading list in conference with the instructor. Your paper should be double-spaced, on letter-sized paper (8.5" x 11"), with one-inch margins on all sides, using ten- or twelve-point type. Proposals, drafts, and papers longer or shorter than the specified lengths are not acceptable. Footnotes should appear at the bottom of the page.

MOT 4010: Management of Science and Technology in the Middle East, Global Seminar

Max-Min Credits for Course: 3.0 to 3.0 credit(s)

Catalog Description: Middle East Global Seminar including 8 weeks of classroom learning prior to departure in May. The course will focus on technology areas of particular interest in the Middle East, such as solar energy, water desalination, security technology, alternative fuels and biomedical devices.

To satisfy the Global Perspectives Theme requirement, a course must meet these criteria:

- * The course, and most or all of the material covered in the course, focuses on the world beyond the United States.

MOT 4010 focuses on the Middle East, a region of the world that is outside the United States.

- * The course either (1) focuses in depth upon a particular country, culture, or region or some aspect thereof; (2) addresses a particular issue, problem, or phenomenon with respect to two or more countries, cultures, or regions; or (3) examines global affairs through a comparative framework.

MOT 4010 discusses the management of technology, a particular issue, in two countries, Israel and Jordan. Jordan is discussed as an example, typical of a number of countries in the Arab world.

- * Students discuss and reflect on the implications of issues raised by the course material for the international community, the United States, and/or for their own lives.

MOT 4010 students will discuss and reflect on the management of technology in the Middle East and on the effects that technology may have on the lives of people who live in that region, as well as the implications of Middle East politics on the entire world.

The Council also recommends that all Learning Abroad experiences for which students earn at least three college credits should fulfill the Global Perspectives Theme requirement.

MOT 4010 is a 3 credit Learning Abroad experience.

To satisfy the Technology and Society Theme requirement a course must meet these criteria:

- * The course examines one or more technologies that have had some measurable impact on contemporary society.

Technologies that will be discussed in MOT 4010 include solar energy, water desalination, military reconnaissance, alternative fuels and biomedical devices.

- * The course builds student understanding of the science and engineering behind the technology addressed.

Discussions of technologies in MOT 4010 will include the science and engineering related to each technology.

- * Students discuss the role that society has played in fostering the development of technology as well as the response to the adoption and use of technology.

The focus of MOT 4010 is the region-specific management of technology and its implications for the countries in the Middle East region.

- * Students consider the impact of technology from multiple perspectives that include developers, users/consumers, as well as others in society affected by the technology.

Discussions of the management of technology in MOT 4010 will include consideration of the impacts of these technologies on all affected parties, including developers, producers, users and bystanders.

* Students develop skills in evaluating conflicting views on existing or emerging technology.

The Middle East is a region where conflict is not hidden. MOT 4010 will include perspectives of various groups that comprise the multicultural mix of the Middle East.

* Students engage in a process of critical evaluation that provides a framework with which to evaluate new technology in the future.

The tools for managing technology presented in MOT 4010 are relevant to both current and future technologies.

MOT 5001 Leading Innovation Teams

Max-Min Credits for Course: 2.0 to 2.0 credit(s)

Catalog Description: (1082 characters, too long, IT->CSE) MOT 5001 is designed to provide graduate students in the Colleges of Pharmacy and IT with a working knowledge of the broader healthcare ecosystem and business context within which scientific research is translated into commercial applications that address consumer health needs and deliver economic value to a firm. The course will broaden students' business knowledge and personal leadership abilities, enabling technical professionals to increase their personal effectiveness leading cross-functional innovation teams in pharmaceutical and healthcare environments. This course will establish a base of knowledge in leadership, organizational and innovation dynamics along with practical skills in personal leadership, professionalism, effective communication, business fundamentals, and the process of commercial innovation. The course content and experiential learning approach are designed to reflect the requirements and challenges scientific professionals need to master in order to thrive in collaborative, cross-functional innovation teams in the healthcare environment. Course Prerequisites for Catalog: Must be a graduate student in the College of Pharmacy or CSE

Course Overview

MOT 5001 is designed to provide graduate students in the Colleges of Pharmacy and IT with a working knowledge of the broader healthcare ecosystem and business context within which scientific research is translated into commercial applications that address consumer health needs and deliver economic value to a firm. The course will broaden students' business knowledge and personal leadership abilities, enabling technical professionals to increase their personal effectiveness leading cross-functional innovation teams in pharmaceutical and healthcare environments. This course will establish a base of knowledge in leadership, organization, and innovation dynamics along with practical skills in personal leadership, professionalism, effective communication, business fundamentals, and the process of commercial innovation. The course content and experiential learning approach are designed to reflect the requirements and challenges scientific professionals need to master in order to thrive in collaborative, cross-functional innovation teams in the healthcare environment.

Textbook

Katz, Ralph (2004). *The Human Side of Managing Technological Innovation* (2nd ed.). New York: Oxford University Press.

Articles

A course packet of cases and articles is included in the required reading for this course. These articles are listed below in the week-by-week course outline.

Web Documents (Available on-line. Links are provided in Web Vista.)

Several on-line documents are included in the required reading for this course. These documents and their respective web addresses are included below in the weekly summary.

Course Requirements

1. Attend all classes. If you must miss a class, please let me know and (1) make arrangements with other group members for a summary and review, (2) do some additional work that will benefit your team.
 2. Read all assigned materials by the assigned date. Teams often will be at a disadvantage if their members have not completed the assigned reading prior to class.
 3. Actively participate in class discussions and team activities.
 4. Satisfactorily complete two knowledge tests and present all three team deliverables on time.
 5. Take responsibility for your learning. If you need help from classmates or the instructor, seek it out. If you have constructive feedback for your classmates or the instructor, offer it in a timely and thoughtful manner.
 6. Follow scholastic conduct policy (See Office for Student Conduct and Academic Integrity (OSCAI) at <http://www.umn.edu/oscai/>).
- If you have special learning needs, please bring documentation from Disability Services and contact me to make suitable arrangements.

Components of Course Grade	Percentage of Grade
Test #1	25%
Test #2	25%
3 Team Project Deliverables + Presentations (#1=10%; #2=10%, #3=15%)	35%
Class Participation & Contribution	15%

Week 1 Introduction to the Course / Getting Started

Week 2 (a) Healthcare Context 1: The Challenge of Innovation in Healthcare

* Herzlinger, Regina E. (2006). Why innovation in Health Care is So Hard. Harvard Business Review, May 2006.

*Case: TBD

(b) Personal Accountability and Effectiveness

* Drucker, Peter F. (2005). Managing oneself. Harvard Business Review, Vol. 83, Issue 1.

Week 3 (a) Healthcare Context 2: Framework for Innovating in Healthcare

* Case: Regina E. Herzlinger, *Innovating in Health Care: Framework*, HBS No. 9-306-042. Boston: Harvard Business School Publishing, 2005.

(b) Understanding and Managing Team Dynamics

* Read the following on-line articles:

(1) Working on Teams: Using the Stages of Team Development (4 pages)

- (2) Working on Teams: Important Steps When Building a New Team (5 pages)
- (3) Basic Guide to Conducting Effective Meetings (4 pages)
- (4) Fast Company: The Seven Sins of Deadly Meetings (6 pages)
- Week 4 (a) Healthcare Context 3: Case TBD
- * Case: TBD
- (b) Feedback and Presentation Skills
- * Phoel, Cynthia (2006). Feedback that works. Harvard Management Update, September 2006.
- * Hackley, Susan (2005). How to say what matters most. Harvard Business School Newsletter: Negotiation, August 2005.
- * Read on-line article: Making effective oral presentations (10 pages) at www.nacubo.org/Events_and_Programs/Speakers_Corner/Making_Effective_Oral_Presentations.html
- Week 5 Team Project #1: Presentations & Discussion
- * Submit Team Project Deliverable #1 at beginning of class
- * Each team has 15 minutes for their presentation / discussion
- Week 6 Business Design and Finance Fundamentals
- * Drucker, Peter F. (2001). What is our business? Executive Excellence, June 2001.
- * Read on-line articles:
 - (1) The business model at <http://quickmba.com/entre/business-model/>
 - (2) The bottom line on margins at <http://investopedia.com/printable.asp?a=/articles/fundamental/04/042804.asp>
- Week 7 Motivation and Leadership of Technical Professionals
- * Read Katz: Section 1 (pages 1-117)
- Week 8 (a) Test #1
- (b) Leadership Roles in the Innovation Process
- * Read Katz: Section 3 (pages 215-282)
- Week 9 Management of Innovative Groups and Project Teams
- * Read Katz: Section 2 (pages 121-211)
- Week 10 Team Project #2: Presentations & Discussion
- * Submit Team Project Deliverable #2 at beginning of class
- * Each team has 15 minutes for their presentation / discussion
- Week 11 Intellectual Property Fundamentals
- * Iandiorio, Joseph S. (2004). Intellectual property. The Portable MBA in Entrepreneurship, Chapter 10, pages 311-349.
- Week 12 Managing Innovative Climates in Organizations
- * Read Katz: Section 4 (pages 405-493)
- Week 13 Managing the Innovation Process in Organization
- * Read Katz: Section 7 (pages 599-710)
- Week 14 Personal Leadership Assessment & Development Planning
- * Goleman, Daniel (2004). What makes a leader? Harvard Business Review, January 2004.
- * Complete Assessment Instrument (TBD)

Final Exam

Test #2 During Assigned Finals Week Time Period