

EN2

Transforming Society- Technology and Choices for the Future

This course will cover important topics relevant to technology and engineering. Chosen topics will vary on a year to year basis in an effort to reflect the most recent and interesting issues in the field; for example, students might learn about engineering ethics and ethical decision making, stem cells in engineering research, and nanotechnology. This course is intended for non-engineering students, and will therefore be non-quantitative in nature. A special design project will allow students to work in groups to design a novel product based on the technologies being covered in class, and then to begin the product patent and marketing process.

Time and Place:

Monday, Wednesday, and Friday 10:00-10:50am
Barus and Holley 166

Instructor:

Karen Haberstroh, Ph.D.
Division of Engineering
Barus and Holley 249
401-863-2858
Email: Karen_Haberstroh@brown.edu

Instructor Office Hours:

TW noon-1pm in Barus and Holley 249
Or by email appointment

TA and Office Hours:

TBA

Text:

“Engineering Your Start-up: A Guide for the High-Tech Entrepreneur,” by James A. Swanson and Michael L. Baird
Additional reading material will be distributed in class and/or placed on the webct site.

Grading:

Homework = 15%
In Class Exercises and Participation =15%
Term Project = 30%
Exams = 20% each

**** All homework is due in hardcopy at the beginning of class - no late homework will be accepted.****

Syllabus

Date	Lecture Number	Topic
W, Jan 23	1	Engineering Ethics 1 - Introduction and case study
F, Jan 25	2	Engineering Ethics 2 – Ethical models
M, Jan 28	3	Engineering Ethics 3 – Ethical problem solving techniques
W, Jan 30	4	Engineering Ethics 4 – Seven step guide to ethical decision making; Ethical Codes
F, Feb 1	5	<i>Special Lecture: Invention Disclosures, Engineering Design, and Introduction to the Group Design Project</i>
M, Feb 4	6	Nanotechnology 1 – Introduction and material structures
W, Feb 6	7	Nanotechnology 2 – Material structures (continued)
F, Feb 8	8	<i>Special Guest Lecture: Lee Pedersen, Science Librarian</i> <i>“Patent Searching and Using the Library’s Resources”</i> <u>HW 1 Due</u>
M, Feb 11	9	<i>Special Guest Lecture: Dr. Thomas Webster</i> <i>“Nanotechnology: Applications in Tissue Engineering”</i>
W, Feb 13	10	Nanotechnology 3 – Molecular nanotechnology
F, Feb 15	11	Nanotechnology 4 – Optics, photonics and solar energy <u>HW 2 Due</u>
M, Feb 18		No Class
W, Feb 20	12	Nanotechnology 5 – Nanoelectronics

F, Feb 22	13	Nanotechnology 6 – Societal impact and ethical Concerns <u>Marketing Summary Due by Today's Class</u>
M, Feb 25	14	<i>Special Panel: “Nanotechnology: Toxicity Issues and Societal Perceptions”</i>
W, Feb 27	15	<i>Special Lecture: Preparing for the Journal Clubs</i>
F, Feb 29	16	<i>Special Guest Lecture: Dean Gregory Crawford “The Cycle of New Product Development”</i> <u>HW 3 Due</u>
M, Mar 3	17	Stem Cells 1 – Overview of cell biology and human development
W, Mar 5	18	Stem Cells 2 – Human development (continued)
F, Mar 7	19	Stem Cells 3 - What is a stem cell?
M, Mar 10	20	Stem Cells 4 – Stem cell sources
W, Mar 12	21	Stem Cells 5 – Stem cell sources (continued)
F, Mar 14	22	Stem Cells 6 - Societal impact and ethical concerns; Regulation <u>HW 4 Due</u>
M, Mar 17	23	MIDTERM EXAM
W, Mar 19	24	<i>Special Guest Lecture – TBA</i>
F, Mar 21	25	Biowarfare and Biosensors 1 – Biowarfare and Bioagents <u>Invention Disclosures Due by Today's Class</u>
Mon Mar 24 through Fri, Mar 28		Spring Break
M, March 31	26	Biowarfare and Biosensors 2 - Introduction to Sensors; Sensor characteristics
W, Apr 2	27	Biowarfare and Biosensors 3 – Sensor classification
F, Apr 4	28	Biowarfare and Biosensors 4 – Sensor

		Classification (continued); Manufacturing technologies
M, Apr 7	29	Biowarfare and Biosensors 5 – Manufacturing Technologies (continued)
W, Apr 9	30	Biowarfare and Biosensors 6 – Introduction to biosensors
F, Apr 11	31	Biowarfare and Biosensors 7 - Types of biosensors <u>HW 5 Due</u>
M, Apr 14	32	<i>Special Guest Lecture: TBA</i>
W, Apr 16	33	Global Warming 1 – Introduction to global Warming: Sources, measurement techniques, greenhouse gas history, etc
F, Apr 18	34	Global Warming 2 – The debate over global warming
M, Apr 21	35	Global Warming 3 – Possible Future Impacts
W, Apr 23	36	<i>Special Guest Lecture: TBA</i>
F, Apr 25	37	Global Warming 4 – Four major “Technofixes” <u>Product Development Reports Due by Today’s Class</u>
M, April 28	38	Global Warming 5 - Renewable and Alternative Energy Sources
W, April 30	39	Global Warming 6 - Renewable and Alternative energy Sources (continued)
F, May 2	40	<i>Special Panel: “The Debate over Wind Power”</i> <u>HW 6 Due</u>
M, May 5	41	<i>Special Guest Lecture: TBA</i>
May 7-16		FINAL EXAM WEEK