

EST 440 Interdisciplinary Research Methods
Department of Technology & Society, Stony Brook University
Spring 2019, Tues & Thurs 10am – 11:20am
Location: CS 1310

Instructor:

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Office Hours:

Tuesdays and Thursdays 11:30am – 1:00pm (or by appointment)

Overview:

This course uses scientific research and engineering technology problem-solving as a framework for the synthesis of diverse disciplines studied by students in the first three undergraduate years. Provides students with experience in team problem-solving. Students will work in teams to conduct a technology assessment. Examples of various types of technology assessments will be studied, and students will discuss analysis techniques and team structuring in order to plan and execute a successful project.

Learning Outcomes:

The ability to research a technology related topic and present the information is a basic skill expected of all students in the Technological Systems Management program. At the end of this course, students should be able to:

- 1) Initiate, conduct, and complete research on general technological subjects, incorporating material that cuts across disciplinary boundaries
- 2) Work together as a team to present oral and written material
- 3) Understand the process of "technology assessment"
- 4) Read and analyze lengthy descriptions of complex technological processes and policies

Grading:

This grading for the class is based primarily on the outcome of your group work and project, and the class is designed as a professional preparatory program. The final grade for the course is comprised of 4 assignments (20%) and one final paper (80%). The breakdown of points is as follows:

%/Points	Activity/Assignment
5%	Assignment 1 - due 2/12/19
5%	Assignment 2 – due 2/21/19
5%	Assignment 3 – due 3/12/19
5%	Assignment 4 – due 3/26/19
80%	Final group technology assessment report and presentation – due 5/9
100	Total Possible

Although the final paper is a group project, *individual* student grades within a group may be reduced or adjusted as needed based on group feedback, as well as attendance during the semester. Each member of a team will confidentially report to me the contribution and performance of the other team members. If it is conveyed to me that you have done very little to contribute to your team's final project, you may receive a lower grade than the rest of your team. I will also be taking attendance every class; students who miss class repeatedly without a valid reason may also receive a lower grade than the rest of the team.

Readings:

All readings for the class will be posted on Blackboard. Significant (longer) readings will be given class time to complete.

- 1.) National Research Council (NRC). (2010). The Rise of Games and High Performance Computing for Modeling and Simulation.
- 2.) Department of Energy (DOE). (2015). Quadrennial Technology Review: An Assessment of Energy Technologies and Research Opportunities
- 3.) Readings on teams/group work (various) – will be posted on Blackboard.

Assignments:

There are four (4) required assignments throughout the semester, worth a total of 20% of your grade (5%/5 points each). These assignments must be submitted by the start of class (10am) on the due date. Assignments must be uploaded to Blackboard.

- 1.) NRC Summary – Prepare a *2 page* summary of the NRC reading (no more than 2 pages). Your summary – in your own words – must make clear that you have read the document (e.g. the summary must include components of the beginning, middle, and end of the technology assessment, and especially must be sure to summarize the findings, recommendations, and conclusions). **Due 2/12/19.**
- 2.) DOE Team Summary – Discuss the DOE report with your team. Choose one chapter to present to the class together. Use the reading day (see schedule) or your own time to discuss the technologies and determine what you will share. Be sure to discuss the methods used to undertake the assessment as well as the findings. **Due 2/21/19. No submission due for this assignment, BUT YOU MUST ATTEND CLASS to get credit.**
- 3.) Methodology Outline – Prepare an *individual* outline of your proposed methodology for conducting your technology assessment including approximate dates/timeline and specific tasks for completion. You will compare methodologies in your team and use them to help you formulate a group plan. **Due 3/12/19.**
- 4.) Team Strategy – Review the document posted on Blackboard for this assignment, and formulate responses about challenges and opportunities of working in teams and how you will handle problems that may arise. **Due 3/26/19.**

Assignments will be graded on Blackboard on a scale of 0-5 points, as follows:

0 points: No submission

2.5 points: Fair/Complete/Acceptable

5 points: Good/Excellent

Project:

The final project is the main component of the course, *worth 80% of your final grade*, and students will be given ample class time throughout the semester to complete a successful project with their team. Depending on the size of our class, there will be approximately 6-8 teams (4-5 members in each team). We will spend time as a class brainstorming suitable project topics. Instead of choosing a *team* or being assigned to a team by me, students will choose the *topic* that most interests them; this should help to pair students with others who also have a strong interest in the chosen technology so that all members of a team are equally motivated and invested in completing a successful project. The final project consists of a report (one assessment report per group; each assessment should be 15-20 pages long), and a class presentation (15-20 minutes). The written report should be a high-quality, well-organized, professional research document with all sources properly cited, etc. The presentations will take place during the last 2 or 3 sessions of class (depending on number of teams), and the assessment will be due on the last day of class. All final papers *must* be uploaded using Blackboard (one team member submits for the team) *and* submitted in hard copy (one copy per team).

Academic Integrity:

Academic integrity is taken very seriously in this class, and students are held to high standards of honesty and accountability in their assignments and writing. As members of a team for this class, please remember you are *all* responsible for the *team's* final product; **ANY** incidence of plagiarism in the class will have serious consequences for the *entire team*, and will be reported to CEAS. As per Stony Brook guidelines:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at:

http://www.stonybrook.edu/commcms/academic_integrity/index.html

Disability Support Services (DSS) Statement

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities>]

Critical Incident Management:

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

Semester Schedule

WEEK	DATE(S)	TUESDAY	THURSDAY
1	1/29, 1/31	Intro to class policies, content and expectations	What is a technology assessment? **In-class topic brainstorm**
2	2/5, 2/7	Reading Day – NO CLASS Read NRC document	In-class review of NRC document Part 1– defining a tech assessment, analyzing structure *Select topic – Use shared Google doc to sign up*
3	2/12, 2/14	In-class review of NRC reading Part 2 – defining a tech assessment, analyzing structure. *Assignment 1 due: NRC summary* *Teams announced (based on student sign-ups)*	Reading Day – NO CLASS Read DOE document
4	2/19, 2/21	Reading Day – NO CLASS Read DOE document	In-class review of DOE report (team presentations) *Assignment 2 due: Team presentations of DOE report*
5	2/26, 2/28	Compare NRC vs DOE – pros & cons of various structures and approaches to tech assessment	In-class team exercise; Discuss other examples and structures of technology assessments (examples posted to Blackboard)
6	3/5, 3/7	Library session (guest speaker) – conducting professional research, finding sources	How to cite and reference sources, avoiding plagiarism Referencing/citation in-class help and examples
7	3/12, 3/14	Challenges and opportunities of working in teams – Read team materials prior to class; Discuss methodologies *Assignment 3 due: Methodology outline*	Progress Report Day - Individual team meetings re: team organization, process, and strategy (ALL TEAM MEMBERS MUST ATTEND)
8	3/19, 3/21	Spring Break – NO CLASS	Spring Break – NO CLASS
9	3/26, 3/28	Research Day – NO CLASS *Assignment 4 due: Working in teams*	Progress Report Day – Check in
10	4/2, 4/4	Research Day – NO CLASS	Progress Report Day – Check in
11	4/9, 4/11	Research Day – NO CLASS	Progress Report Day – Check in
12	4/16, 4/18	Research Day – NO CLASS	Progress Report Day – Check in
13	4/23, 4/25	Research Day – NO CLASS	Progress Report Day – Check in
14	4/30, 5/2	Research Day – NO CLASS	Progress Report Day – Check in
15	5/7, 5/9	Presentations Day 1	Presentations Day 2 *Final assessment papers due*

Grading Rubric for Final Paper

Category	Assessment	Points
Organization, Format, and Clarity	<ul style="list-style-type: none"> Is paper well organized and clear, roughly following some format of a technology assessment of the group's choosing (SWOT, STIP, etc.)? (4 points) Are sources properly cited within the text? (4 points) Are sources properly cited at end of paper? (4 points) Is the paper free from spelling and grammatical errors? (4 points) 	16
Technology	<ul style="list-style-type: none"> Does the paper convey an expert-level understanding of the chosen technology (what is the technology, how did it develop, and how does it work?) (12 points) Does the paper accurately situate the technology in its larger context (its market, competitors, etc) (12 points) 	24
Impacts	<ul style="list-style-type: none"> Does the paper convey <i>positive</i> impacts of the technology in a comprehensive way (6 points) Does the paper convey <i>negative</i> impacts of the technology in a comprehensive way? (6 points) Does the paper address quantifiable (e.g. financial/economic) benefits and drawbacks? (6 points) Does the paper address non-quantifiable (e.g. societal) benefits and drawbacks? (6 points) 	24
Assessment and Recommendations	<ul style="list-style-type: none"> Does the paper convey final recommendations/findings, based on the research, for policy, society, markets, or other impacted sectors in a reasonable way? (6 points) Does the ending/conclusion of the paper synthesize and bring together everyone's individual sections? (6 points) Is the paper overall written in an objective, non-biased, fact-based way? (e.g. this should <i>not</i> be a persuasive, opinion-based document). (4 points) 	16

Final Paper Grading: (Conversion to letter grade and 100-point scale)

80 points = A (100)
 78 points = A (97.5)
 76 points = A (95)
 74 points = A- (92.5)
 72 points = A- (90)
 70 points = B+ (87.5)
 68 points = B+ (85)
 66 points = B (82.5)
 64 points = B (80)
 62 points = C+ (77.5)
 60 points = C+ (75)
 58 points = C (72.5)
 56 points = C (70)