New York City College of Technology
Interdisciplinary Committee

Criteria for an Interdisciplinary Course
   I. Interdisciplinary Studies Definition

Interdisciplinary studies involve two or more academic disciplines or fields of study organized around synthesizing distinct perspectives, knowledge, and skills. <u>Interdisciplinary study focuses on questions, problems, and topics too complex or too broad for a single discipline or field to encompass adequately; such studies thrive on drawing connections between seemingly exclusive domains.</u> Usually theme-based, interdisciplinary courses intentionally address issues that require meaningful engagement of multiple academic disciplines. Pedagogical strategies focus on, but are not limited to, inquiry or problem-based learning.

Although many academic disciplines, such as African American Studies and Engineering, are inherently interdisciplinary, <u>to be considered an interdisciplinary course at City Tech the course must be team-taught[1] by more than one faculty member from two or more departments[2] in the College. An interdisciplinary course, by definition, has an interdisciplinary theme as its nucleus.</u> In its essence, such a course brings the analytic methods of two or more academic disciplines to bear on a specific problem or question. Thus, a course in Music History is not likely to be considered interdisciplinary, but a course in Music History from an economist's perspective might very well lead to such a course. The application of different methods and concepts is the key to assessing whether a course is or is not interdisciplinary. The term interdisciplinary is occasionally used to identify individual projects or assignments, but these, though possibly commendable, fall short in the necessary scope for learning experiences that demand in-depth exposure to the methodologies of distinct intellectual disciplines, and the creative application of these methodologies to specific problems.

Studies show that interdisciplinary courses improve student learning (Elrod & Roth, 2012; Klein, 2010; Lattuca, 2001; Lattuca, Voigt, & Fath, 2004; Project Kaleidoscope, 2011). To foster interdisciplinary learning, the Interdisciplinary Committee has identified goals and outcomes that students taking interdisciplinary courses should be able to achieve.

Learning Outcomes of Interdisciplinary Courses
Students will be able to:
- Purposefully connect and integrate across-discipline knowledge and skills to solve problems
- Synthesize and transfer knowledge across disciplinary boundaries
- Comprehend factors inherent in complex problems
- Apply integrative thinking to problem-solving in ethically and socially responsible ways
- Recognize varied perspectives
- Gain comfort with complexity and uncertainty
- Think critically, communicate effectively, and work collaboratively
- Become flexible thinkers

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[1] See "Application for Interdisciplinary Course Designation" question 9b for team-teaching options.
[2] Exceptions are made for Departments that provide a home for multiple disciplines, such as Humanities and Social Science.

Application for Interdisciplinary Course Designation

Date __Sept 19, 2019_____

Submitted by _Geoff Zylstra_____

Department(s) __ Social Science _____

     II.   Proposal to Offer an Interdisciplinary Course

1. Identify the course type and title:

     ☑ An existing course _HIS 3209 - History of Technology_____ _____

     ☐ A new course _____

     ☐ A course under development _____

2. Provide a course description __From the Catalogue: "An examination of technology in North America from Native American inhabitation to the present. Focusing on the relationship between technology and cultural value systems, this course addresses the historical development of our current technological society. Topics include the relationship of technological change to class, gender and racial divisions, the creation of large-scale technological systems, and ethical debates regarding the appropriate use of technology."

3. How many credits will the course comprise? __3___ How many hours? _3_____

4. What prerequisite(s) would students need to complete before registering for the course? Co-requisite(s)? ENG 1101 and a previous history course._____

5. Explain briefly why this is an interdisciplinary course. _History of technology is already, before the participation of faculty from other disciplines, a highly interdisciplinary course. While studying the past, students connect cultural theory, science, art and literature, and social categories to the development of the broader material world in North America. Whether studying technology transfer and the relationship between Native Americans and colonists, the development of racial categories during the industrial revolution, literature such as Huxley's *Brave New World*, or the importance of hydrocarbons to chemical technologies, students will examine a broad range of interdisciplinary topics. The idea that humanism is relevant to technology studies – a theme explored in Zylstra's NEH grant entitled, "Making Connections" - underpins this course and students from a variety of majors

will learn that the functions of technologies are intimately connected to broader social, cultural, and environmental issues. _____ _____

6. What is the proposed theme of the course? What complex central problem or question will it address? What disciplinary methods will be evoked and applied?

This is a history course that examines the development of technology in North America from Native American inhabitation to the present. Within this historical framework a great many themes will be addressed. I list several semester long themes below:

1. Technological determinism vs. social construction of technology vs. technopolitics
2. Technology transfer and cultural exchange
3. The relationship between science and technology
4. Race, ethnicity and technological development (also gender)
5. Hegemony and technological systems
6. The technological production of space (in the Lefebvre sense)
7. The changing process of innovation
8. Modernity and postmodernity as they relate to industrial and postindustrial technology and society

In addition to history, I will utilize several other disciplinary methods in this course. I list examples of these below The addition of three faculty visitors from Philosophy, English, and Biology will add even more.

Disciplinary methods currently used in addition to history:
1. Cultural Theory: This is a highly theoretical course. In almost every class, I connect technological development to cultural theory.
2. Science: I teach science in this history course. For example, when discussing electricity, chemical technologies like plastics, nuclear technologies, and biotechnology, Students learn physics, chemistry and biology.
3. Literature: I assign the 1932 novel *Brave New World* by Aldous Huxley and we spend one hour discussing this book.
4. Film Studies: We watch part of the Charlie Chaplin film *Modern Times* and discuss it in class.

7. Which general learning outcomes of an interdisciplinary course does this course address? Please explain how the course will fulfill the bolded mandatory learning outcome below. In addition, select and explain at least three additional outcomes.

☑ **Purposefully connect and integrate across-discipline knowledge and skills to solve problems:** Technology is often viewed as a solution to a problem. Sometimes the problems are technical or scientific in nature, other times the problems are social. History of Technology addresses various ways that people have used technology to solve problems in the past and projects this into the future. For example, when looking at energy technologies we discuss ways that electrical technologies were used to solve problems related to domestic and public space. We also discuss how energy relates to fossil fuels, renewable and linear energy flows and how this relates to future methods of generating energy. Often technology has been employed to solve social problems and to exert social power. This is a big theme of the course. For example, many whites, after the Civil War, used Jim Crow segregation to recreate racial

hierarchies. Jim Crow segregation is highly technological – railroad cars, train stations, drinking fountains, lunch counters, etc. These whites viewed the segregation of technology as a solution to a perceived racial problem. This kind of technological segregation still exists. An example would be Silicon Valley startup funds for small technology companies. Whites and Asians receive the majority of this funding, a situation that then reproduces ethnic power dynamics in our society. Students need to be able to consider ways to use technology as a solution to a problem and also critique the social consequences that relate to how we use technology to solve problems.

☑ **Synthesize and transfer knowledge across disciplinary boundaries:** Synthesizing and transferring across disciplines is a large part of History of Technology. The answers to question 6 above show this. However, I perceive myself as transferring analytical skills more than knowledge. Yes, my students see how knowledge from different disciplines connects. More importantly, the kinds of intellectual tools used by the different disciplines intersect in meaningful ways. For example, how can race, as an analytical tool, be used to understand the design and function of transportation systems? How can gender and marketing be used to study the mass consumption of consumer electronics in the early 20th century? These are the kinds of intellectual cross-disciplinary intersections my students engage in class on a daily basis.

☑ **Comprehend factors inherent in complex problems:** In History of Technology I focus on how increasingly complex systems developed in the late 19th and 20th centuries. These systems encompass many technical and social dynamics. We study the problems solved in the development of technological systems, but also the problems, technical and social, created by technological systems – that we all face on a near daily basis.

☑ A**pply integrative thinking to problem solving in ethically and socially responsible ways:** As I emphasize race, gender, changing work relationships, hegemony, and other elements of power related to the development of modern and post-modern environments, ethics and social responsibility are built into this course. While I do not advocate for particular viewpoints, this course raises curricular questions that force students to think about ethics and society as they relate to technology.

☑ **Recognize varied perspectives:** History has been taught in a Eurocentric manner for far too long. The readings and topics in History of Technology confront this problem. I assign *A Hammer in Their Hands: A Documentary History of Technology and the African-American Experience* and *A Social History of American Technology* as texts. These texts and the classroom experiences emphasize race and gender as varied perspectives. Additionally, students need to write a research paper that addresses how a historical technology of their choice relates to a specific social category.

☐ Gain comfort with complexity and uncertainty

☑ **Think critically, communicate effectively, and work collaboratively:** This is a major Gen Ed objective in all of my courses. Students will need to employ these skills every day for the rest their lives. In History of Technology I utilize weekly analysis of historical document to encourage critical thinking. Students regularly do informal group work in class. Each student presents their research project to the class before the final draft is due, in order to receive feedback. This is a writing intensive course and students are asked to write 20-25 pages over the course of the semester.

☑ **Become flexible thinkers:** A large focus of this class is to encourage students to consider technologies in new ways. The readings and class experiences move students away from common conceptions of technological change and ask them to use multiple modes of thinking to study technology.

☐ Other

General Education Learning Goals for City Tech Students
- **Knowledge:** Develop knowledge from a range of disciplinary perspectives, and hone the ability to deepen and continue learning.
- **Skills:** Acquire and use the tools needed for communication, inquiry, creativity, analysis, and productive work.
- **Integration**: Work productively within and across disciplines.
- **Values, Ethics, and Relationships**: Understand and apply values, ethics, and diverse perspectives in personal, professional, civic, and cultural/global domains.

8. How does this course address the general education learning goals for City Tech students?
     (1) History of Technology is a course that through curriculum and pedagogy addresses Gen Ed learning goals. The course content is filled with both factual information and also a significant amount of cultural theory that helps students understand the historical information as well as the current technological landscape in which they will be working. (2) I teach this course because values, ethics, and relationships are profoundly important to me and, with regard to technology, our twenty-first century society does not value them enough. (3) Finally, this course, because it focuses on how technology operates, various social formations at different times, and how to apply cultural theory, works very well across disciplines.

9. Which department would house this course[3]? Social Science – Where it is currently housed_____

    Would all sections of the course be interdisciplinary? ☑ No ☐ Yes

    a) Would the course be cross-listed in two or more departments? ☑ No ☐ Yes
       Explain.

    b) How will the course be team-taught[4]? ☐ Co-taught ☑ Guest lecturers ☐ Learning community

       If co-taught, what is the proposed workload hour distribution? _____
       ☐ Shared credits ☐ Trading credits
       If guest lecturers, for what approximate percentage of the course? ☑ Minimum 20%[5] ☐ other: __%

       Please attach the evaluation framework used to assess the interdisciplinarity of the course.[6]

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[3] An interdisciplinary course for the College Option requirement may be housed in a department that is not liberal arts.
[4] Attach evidence of consultation with all affected departments.
[5] While an interdisciplinary course must be team-taught, there is no formal percentage requirement, but this minimum is a guideline.
[6] In the case that a course is equally taught, include proposed plans for faculty classroom observation and student evaluation of teaching.

c) What strategies/resources would be implemented to facilitate students' ability to make connections across the respective academic disciplines?

> Lectures from professors outside history. In class exercises. Writing assignments that ask students to create intersections between different ways of thinking about technology. Conversations in the classroom.

10. Would the course be designated as:
    ☐ a College Option requirement[7]? ☐ an elective? ☑ a Capstone course[8]? ☑ other? WI

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[7] To qualify for the College Option, such a course must also meet the New York State definition of a liberal arts and sciences course. http://www.nysed.gov/college-university-evaluation/department-expectations-curriculum
[8] A course proposed as a Capstone course must be separately approved by the Capstone Experience Committee.

Evaluation Framework

The Following Professors have agreed to participate in HIS 3209ID – History of Technology

1. Laureen Park – Philosophy
2. Jason Woodrow Ellis – English
3. Tatiana Voza – Biology

1. The first aspect of assessment will be an informal examination by the Professors to gauge whether adding material from different disciplines enriches the History of Technology curriculum.
2. Questions will be added to the midterm and final exams to assess the students on the interdisciplinary material.
3. The research paper, which is already highly interdisciplinary, will be used to evaluate how students are applying interdisciplinary concepts in their own work.
4. A course assessment, created by Prof. Zylstra, will be provided to the students. On this assessment they will be able to critique the construction of the course, delivery of materials and the assignments.