January 9, 2009

TO: Dan Mendelsohn, Chair, CAA

FR: Bob Gustafson, Director, EEIC

C: Ann Christy, Interim Associate Dean
C: George Valco, Chair, CCAA

RE: Clarifications of the Two Proposed Minors from Engineering

We appreciate your feedback regarding the Proposed Minors entitled: A. Engineering Sciences Minor and B. Technological Studies Minor. The following changes have been made to the body of the proposal in response to your concerns.

1. It is clarified that the minor is offered by the College of Engineering and only administered by the Engineering Education Innovation Center. We have modeled this after the Minor in Professional Writing offered by the College of Humanities and administered through the Center for the Study and Teaching of Writing. We plan on having an oversight committee specifically for these two minors. This committee will report directly to the Core Curriculum and College Services Committee which acts as the curriculum committee for all courses offered at the college level. This committee in turn reports to the College Committee on Academic Affairs in the same manner as all academic units within the college.

2. Regarding student involvement in the development of the proposals, there were multiple students on both of the reviewing committees in the College (Core Curriculum and College Services Committee and College Committee on Academic Affairs). The proposal was also discussed with advisors and administrators in several colleges who are very aware of student needs in their colleges. Consistent with College policy, we intend to have student representatives on the Minor Oversight Committee as well.

3. Students in the minor will initially be advised by the Director of the EEIC in collaboration with our College Advising Office personnel. When we have gained some experience with the minor, advising will most likely be delegating to one of the advisors in our college advising unit, under the guidance of the EEIC Director.

Attached is 1) the original submission memo, 2) a revised copy of the body of the proposal, and 3) a copy of the original appended material including New Course Request forms for four courses.
Attached is a proposal from the College of Engineering requesting approval of two undergraduate minors. The first is entitled Engineering Science. The second is entitled Technological Studies. Given the complimentary nature of the two minors, a combined proposal is being submitted. Both minors are to be supported and managed through the Engineering Education Innovation Center (EEIC).

This proposal was unanimously approved by the College of Engineering's Committee on Academic Affairs (CCAA) on the 13th of May 2008. Please note that CCAA also approved an exception to its policy of not allowing 100 level courses in minors offered by the college for these two minors. CCAA allowed this exception due to the appropriate nature and academic rigor of the 100 level courses in the minor. The courses in questions, Engineering 181, 183 (or alternatively Engineering 191H, and 193H), have a minimum prerequisite of Math 150 and provide the student an extensive knowledge of engineering fundamentals. If you have any questions about this proposal please contact either myself or Robert J. Gustafson, Director of the EEIC.
Proposal
For
Two Undergraduate Minors in Technological Literacy
A. Engineering Sciences Minor
B. Technological Studies Minor

Sponsoring Unit: Offered by College of Engineering, Administered through Engineering Education Innovation Center

Contact Person(s):
Ann C. Christy, Interim Associate Dean for Undergraduate Education and Student Services, College of Engineering
Robert J. Gustafson, Director, Engineering Education Innovation Center

Development of the Minors

University review of General Education at Ohio State has brought forth the need for technological literacy as an insight area within general education. However, to date no satisfactory solutions to address this insight area have been established. In December of 2006, within the College of Engineering the Core Curriculum and College Services Committee and College Committee on Academic Affairs agreed to establish a joint task force to consider what the College of Engineering could offer for non-engineering students in terms of one or more minors, with particular focus on the area of technological literacy. Members of the task force were Sandra Doty (Physics), Bob Gustafson, Chair (Associate Dean), Blaine Lilly (IWSE), Ed McCaul (College Office), Ed Newman (ECE), Andrea Severson (Advising). The task force members consulted the colleges of potential students (Business; Food, Agriculture and Environmental Sciences; Education and Human Ecology; and College of Arts and Sciences) , primarily through advisors and administrative representatives. As can be seen in the concurrence section, feedback received from the colleges was positive. The committee reported in March of 2007. It recommended the development of two minors. Both Committees include multiple student representatives. The recommendations of the report were endorsed by both committees. The following proposal outlines the objectives, audiences and content for two minors in the domain of technological literacy.

Working Definition for Technological Literacy

A review of literature and existing programs showed that there is no universally accepted definition of technological literacy. However the college has chosen to work from the basic description and general learning objectives developed by a recent Technological Literacy Task Force in the Colleges of the Arts and Sciences1.

In the broadest sense, technology is the process by which we modify nature and society using knowledge of science and engineering to create new ways to meet our needs and

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1 Extracted from “Proposed Supplement to “A Model Curriculum Developed by the Special Committee for Undergraduate Curriculum Review in Arts and Sciences and Approved by the Faculty of the Colleges of the Arts and Sciences, June 8, 1988” 12/12/06
wants. Technology comprises the entire system of people and organizations, knowledge, and processes that go into creating and operating technological devices and systems.

An especially important area of knowledge is the design process, of starting with a set of criteria and constraints and working toward a solution—a device, say, or a process—that meets those conditions. Attempts to create new technology provide tests of scientific understanding, and some new technology enables new forms of scientific measurement and theorizing, so that science and technology are mutually reinforcing.

Understanding technology, technological literacy, encompasses three interdependent dimensions—knowledge, ways of thinking and acting, and capabilities. Like literacy in other areas, the goal of courses on technological literacy is to provide people with the tools to participate intelligently and thoughtfully in the world around them. Although the kinds of things a technologically literate person must know can vary from society to society and from era to era, they are consistent with the goals of an educated person as expressed by the Ohio State University General Education model.

GENERAL LEARNING OBJECTIVES

The general learning objectives most relevant to the general education can be expressed within the knowledge and ways of thinking and acting as:

Knowledge
• To recognize the pervasiveness of technology in everyday life.
• To understand basic technological/engineering concepts and terms, such as systems, constraints, and trade-offs.
• To be familiar with the nature and limitations of the design process in a technological system.
• To know some of the ways technology shapes human history and people shape technology.
• To know that all technologies entail risks, some that can be anticipated and some that cannot.
• To appreciate that the development and use of technology involve trade-offs and a balance of costs and benefits.
• To understand that technology reflects the values and culture of society.

Ways of Thinking and Acting
• Asks pertinent questions of self and others regarding the benefits and risks of technologies.
• Seeks information and hands-on skills related to existing and new technologies.
• Participates when appropriate in decisions about the development and use of technology.
• Can apply basic mathematical concepts related to probability, scale, and estimation to make informed judgments about technological risks and benefits.

Another useful description related to technological literacy can be found through the International Technology Education Association (ITEA) documents (http://www.iteaconnect.org/Publications/publications.htm), which can be summarized as:

- A technological literacy is the ability to use, manage, assess, and understand technology. (ITEA)
- A technological literate person is a person who understands – with increasing sophistication – what technology is, how it is created, how it shapes society, and in turn is shaped by society. (ITEA)

Potential Audiences

In order to offer the most value in a minor and meet learning objectives in the most effective fashion, the conclusion was reached that it is best to view the potential audience for minors we may offer as two groups. The first group would be those who will likely be working most directly with engineers in the future and who can be expected to have mathematics capability through beginning calculus. A minor for this group is termed Engineering Sciences Minor. The second group would be those who are looking to the minor to build their technological literacy in a more general sense and who may not have as high a level of quantitative coursework background. A minor for this group is termed the Technological Studies Minor and is intended for the goal of creating a more technologically literate citizen. As will be seen in the following section, the Task Force identified examples of these key audiences, learning goals for each minor, key curriculum components, and a proposed curriculum structure. Students enrolled in degree programs within the College of Engineering would not be eligible for either of the two minors.

Model Curriculum Structure for Two Minors

Table 1 summarizes and differentiates the two minors. In each case the Learning Goals are defined in a manner appropriate to the intended audience and the curriculum is structured appropriately to the background and needs of the audience.

Engineering Sciences

The two core courses for the Engineering Sciences minor are two first courses currently taken by all engineering majors. These courses form foundational knowledge and skills that are important to the engineering profession and following courses. Since teamwork, communications and a design experience are included as significant elements of these courses, they will no doubt contribute to the ability of the non-engineering students to work with those oriented towards engineering and understand the engineering design process. The minor adds more depth by the requirement of an Engineering Science course and a Computation Technologies course. These courses will give the student exposure to technical knowledge engineers use through the design process. Criteria for engineering science courses includes that the course must be available to the students without prerequisites beyond selection of an appropriate natural science course and a basic calculus course. The minor is enhanced by an element reflected by a course in the domain of Technology and Society. The capstone class for the minor gives the student direct experience working as part of an engineering design team. This should directly build their skills towards the objective of being able to work effectively with technological experts. Table 2 further documents the courses and prerequisites for the Engineering Sciences Minor.

Technological Studies
Two options are available for the core element of the Technological Studies minor. For the first core option, two new courses are included specifically to introduce technological concepts for a non-engineering audience. Technical and practical aspects of several technology areas will be explored. A prerequisite of one science course from Biology, Chemistry or Physics, as these are considered fundamental sciences, is required. The natural science requirement assures at least some exposure in this area. The second core option may appeal to those who have the higher mathematics prerequisite and want a quantitatively more rigorous approach. Facility with computational technology is needed for technology considerations, leading to the curriculum requirement in this area for both minors. Students also need to be able to place technological development in a societal context, which is the focus of the Technology and Society course requirement for both minors. This segment uses as a reference the Foundational and Core Courses of the Societal Perspectives about Science and Technology Minor (Sci & Tech 336)\(^5\). A capstone seminar focusing on current technological topics of broad interest will complete the minor package. Table 3 further documents the courses and prerequisites for the Technological Studies Minor.

Table 1. Construct for Engineering Science and Technological Studies Minors

<table>
<thead>
<tr>
<th>Key Audience</th>
<th>Engineering Sciences Minor</th>
<th>Technological Studies Minor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students who have an interest in working with technology experts/engineers and in technology based industry/environments. <strong>Examples:</strong> Business, Economics, Science, and Math majors <strong>Assumptions:</strong> Competence in mathematics through beginning concepts of calculus</td>
<td>Students who have interest in understanding technology at a level that will help make them be more informed citizens and perhaps more attractive to employers. <strong>Examples:</strong> Humanities and Arts majors <strong>Assumption:</strong> No particular prerequisites</td>
<td></td>
</tr>
<tr>
<td>Learning Goals - At the completion of the minor, students will be able to:</td>
<td>1 - demonstrate a basic understanding of the engineering design process</td>
<td>1 - appreciate the importance of methods and underlying assumptions used in cost-benefit analysis and risk-benefit analysis by engineers.</td>
</tr>
<tr>
<td>2 - perform simple analysis and estimation using engineering methodology</td>
<td>2 - achieve a survey-level understanding of why particular materials and processes are used to produce simple engineering devices and systems</td>
<td></td>
</tr>
<tr>
<td>3 - understand the capabilities and limitations of basic manufacturing processes and engineered systems</td>
<td>3 - better understand the role of technology (engineering) in society and the interactions of technology (engineering) with their major field</td>
<td></td>
</tr>
<tr>
<td>4 - make informed decisions about the desirability of engineering activities by weighing the benefits of those activities against the risks.</td>
<td>4 - understand how to access and interpret reliable information to make informed decisions regarded technological issues</td>
<td></td>
</tr>
<tr>
<td>5 - work effectively as a member of a team including technological experts.</td>
<td></td>
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</tr>
<tr>
<td>Key curriculum components</td>
<td>Understand fundamentals of engineering science and design (beginning calculus prerequisite)</td>
<td>“How it works” (minimal level of prerequisites)</td>
</tr>
<tr>
<td>Model Curriculum</td>
<td>• Introduction to Engineering</td>
<td>• Introduction to Engineering</td>
</tr>
</tbody>
</table>

### Design process
- Communication with graphics tools
- Numerical approaches to problem solving
  - Science base and complimentary engineering science base
  - Computational technology competence
  - Appreciation of interaction of technology and society
  - Capstone interdisciplinary teamwork experience.

### Prerequisites:
- Math 117, 131 or 151; and Natural Science Dependent on Engineering Science selected.
- Any GEC approved Natural Science course in Biology, or Chemistry or Physics

### Core (6-8 credits)
- ENG 181 (3) Introduction to Engineering I
- ENG 183 (3) Introduction to Engineering II
  Or
- ENG 191H (4) Engineering Fundamentals and Laboratory I
- ENG 193H (4) Engineering Fundamentals and Laboratory III

### Core (9-11 credits)
- Option 1:
  - ENG 201 (5) Technological Studies I: Analyzing Our World, (New Course)
  - ENG 202 (5) Technological Studies II: Analyzing Our World, (New Course)
- Or Option 2:
  - ENG 181 (3) Introduction to Engineering I,
  - ENG 183 (3) Introduction to Engineering II
  - ISE 504 (3) Engineering Economic Analysis
  Or
  - ENG 191H (4) Engineering Fundamentals and Laboratory I
  - ENG 193H (4) Engineering Fundamentals and Laboratory III
  - ISE 504 (3) Engineering Economic Analysis

### Engineering Science (3 credits minimum):
- AERO 200 (5) Introduction to Aerospace Engineering
- CE 410 (3) Environmental Pollution and Control
- CE 511 (3) Introduction to Environmental Engineering
- Educ: T&L 220 (3) Design of Constructed and Manufactured Goods
- FABE 481 (4) Introduction to Food Process Engineering
- II&VCD 230 (3) Basic Design Concepts for Non-majors
- ISE 311 (3) Manufacturing Engineering
- ISE 406 (4) Industrial Quality Control
- ISE 504 (3) Engineering Economic Analysis
- MSE 205 (3) Introduction to Materials Science and Engineering
- MSE 281 (1) Materials Processing
Laboratory
WE 300 (3) Survey of Welding Engineering
WE 350 (1) Introduction to Welding Laboratory
Other Engineering courses by permission of the Minor Coordinator

<table>
<thead>
<tr>
<th>Computation Technologies (4 – 5 credits)</th>
<th>Computation Technologies (4 – 5 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 201 (4) Elementary Computer Programming</td>
<td>CSE 201 (4) Elementary Computer Programming</td>
</tr>
<tr>
<td>CSE 202 (4) Introduction to Programming and Algorithms for Engineers and Scientists</td>
<td>CSE 202 (4) Introduction to Programming and Algorithms for Engineers and Scientists</td>
</tr>
<tr>
<td>CSE 203 (4) Computational Thinking in Context: Interactive Video and Games</td>
<td>CSE 203 (4) Computational Thinking in Context: Interactive Video and Games</td>
</tr>
<tr>
<td>CSE 204(4) Computational Thinking in Context: Digital Images and Sound or Higher Level CSE class</td>
<td>CSE 204(4) Computational Thinking in Context: Digital Images and Sound or Higher Level CSE class</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technology and Society (5 credits)</th>
<th>Technology and Society (5 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparative Studies 272 (5) Science and Society</td>
<td>Comparative Studies 272 (5) Science and Society</td>
</tr>
<tr>
<td>Comparative Studies 597.01 (5) Global Studies of Science and Technology</td>
<td>Comparative Studies 597.01 (5) Global Studies of Science and Technology</td>
</tr>
<tr>
<td>ENG 360.02 (5) History of American Technology (New course)</td>
<td>ENG 360.02 (5) History of American Technology (New course)</td>
</tr>
<tr>
<td>ENG 367 (5) American Attitudes about Technology</td>
<td>ENG 367 (5) American Attitudes about Technology</td>
</tr>
<tr>
<td>History 362 (5) History of Technology</td>
<td>History 362 (5) History of Technology</td>
</tr>
<tr>
<td>Physics 367 (5) Use of Science in Solving Problems of Society</td>
<td>Physics 367 (5) Use of Science in Solving Problems of Society</td>
</tr>
<tr>
<td>Sociology 302 (5) Technology and Global Society</td>
<td>Sociology 302 (5) Technology and Global Society</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capstone Experience (4 - 8 credits):</th>
<th>Capstone Seminar (2 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 581 (4-8) Engineering Capstone Collaboration (New course)</td>
<td>ENG 582 (2) Technology Issues Seminar (New Course)</td>
</tr>
</tbody>
</table>

22 credits minimum 20 credits minimum
Table 2. Engineering Science Minor: Courses and Prerequisites

<table>
<thead>
<tr>
<th>Course (Credits)</th>
<th>Title</th>
<th>Prerequisites</th>
<th>Concurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core (6-8 credits)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG 181 (3)/191H  (4)</td>
<td>Introduction to Engineering I/Engineering Fundamentals and Laboratory I</td>
<td>Prereq or Concur Math 150 or higher/Math 151 or higher and honors status</td>
<td>Student pursuing the minor will be admitted to ENG 181 with Math 130 concurrent</td>
</tr>
<tr>
<td>ENG 183 (3)/193H  (4)</td>
<td>Introduction to Engineering II/Engineering Fundamentals and Laboratory II</td>
<td>ENG 181/ENG 192H</td>
<td>NA</td>
</tr>
<tr>
<td>Engineering Science (3 credits minimum):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AERO 200 (5)</td>
<td>Introduction to Aerospace Engineering</td>
<td>Prereq or Concur: Math 152, Physics 131, and minimum cumulative Pt-hr ratio of 2.00</td>
<td>NA</td>
</tr>
<tr>
<td>CE 410 (3)</td>
<td>Environmental Pollution and Control</td>
<td>Chem 101 or equiv with written permission of instructor</td>
<td>NA</td>
</tr>
<tr>
<td>CE 510 (3)</td>
<td>Principles of Hydraulics</td>
<td>Math 151 and Physics 111 or 131</td>
<td>NA</td>
</tr>
<tr>
<td>CE 520 (3)</td>
<td>Design of Treatment Facilities</td>
<td>Chem 122 or 125</td>
<td>NA</td>
</tr>
<tr>
<td>Educ: T&amp;L 220 (3)</td>
<td>Design of Constructed and Manufactured Goods</td>
<td>EN Graph 121</td>
<td>Education concurs with use of course. ENG 183 will substitute for En Graph 121 (See Appendix B)</td>
</tr>
<tr>
<td>FABE 481 (4)</td>
<td>Introduction to Food Process Engineering</td>
<td>Math 148, and Physics 106 or 111. Open to non-engineering majors only.</td>
<td>NA</td>
</tr>
<tr>
<td>II&amp;VCD 230 (3)</td>
<td>Basic Design Concepts for Non-majors</td>
<td>Not open to majors in design or pre-design.</td>
<td>Concurrence requested but no response received. Will withdrawal course from minor if offering department requests such action</td>
</tr>
<tr>
<td>ISE 311 (3)</td>
<td>Manufacturing Engineering</td>
<td>2nd yr standing or written permission of instructor</td>
<td>NA</td>
</tr>
<tr>
<td>ISE 406 (4)</td>
<td>Industrial Quality Control</td>
<td>Math 153</td>
<td>NA</td>
</tr>
<tr>
<td>ISE 504 (3)</td>
<td>Engineering Economic Analysis</td>
<td>3rd yr standing or concur with 500 or written permission of instructor</td>
<td>NA</td>
</tr>
<tr>
<td>MSE 205 (3)</td>
<td>Introduction to Materials Science and Engineering</td>
<td>Math 141 or 151 or 161; Physics 131, and Chem 121 or Chem H201</td>
<td>NA</td>
</tr>
<tr>
<td>MSE 281(1)</td>
<td>Materials Processing Laboratory</td>
<td>MSE 205 or concur</td>
<td>NA</td>
</tr>
<tr>
<td>WE 300 (3)</td>
<td>Survey of Welding Engineering</td>
<td>One unit high school physics</td>
<td>NA</td>
</tr>
<tr>
<td>WE 350 (1)</td>
<td>Introduction to Welding Laboratory</td>
<td>Concur: 300 and acceptance into Weld Eng</td>
<td>NA</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Prerequisite(s)</td>
<td>Notes</td>
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<td>-------------</td>
<td>------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>CSE 200</td>
<td>Computer Assisted Problem Solving for Business</td>
<td>Math 116, 130 or 148</td>
<td>NA</td>
</tr>
<tr>
<td>CSE 201</td>
<td>Elementary Computer Programming</td>
<td>Math 075</td>
<td>NA</td>
</tr>
<tr>
<td>CSE 202</td>
<td>Introduction to Programming and Algorithms for Engineers and Scientists</td>
<td>Math 151</td>
<td>NA</td>
</tr>
<tr>
<td>CSE 203</td>
<td>Computational Thinking in Context: Interactive Video and Games</td>
<td>None</td>
<td>NA</td>
</tr>
<tr>
<td>CSE 204</td>
<td>Computational Thinking in Context: Digital Images and Sound</td>
<td>None</td>
<td>NA</td>
</tr>
<tr>
<td>Comparative Studies 272</td>
<td>Science and Society</td>
<td>English 110 or equiv.</td>
<td>Concurrence received 3/6/08</td>
</tr>
<tr>
<td>Comparative Studies 597.01</td>
<td>Global Studies of Science and Technology</td>
<td>Completion of GEC second writing course, quantitative and logical skills requirement, and natural science sequence; or permission of instructor.</td>
<td>Concurrence received 3/18/08</td>
</tr>
<tr>
<td>ENG 360.02</td>
<td>History of American Technology</td>
<td>English 110 or 111</td>
<td>NA</td>
</tr>
<tr>
<td>ENG 367</td>
<td>American Attitudes about Technology</td>
<td>English 110 or 111, Soph standing or above.</td>
<td>NA</td>
</tr>
<tr>
<td>History 362</td>
<td>History of Technology</td>
<td></td>
<td>Concurrence requested but no response received. Will withdrawal course from minor if offering department requests such action</td>
</tr>
<tr>
<td>Physics 367</td>
<td>Use of Science in Solving Problems of Society</td>
<td>Math Placement S or higher; 1 Shr 100-level course in either astron, bio sci, chem., geol sci, or physics; English 110 or 111 or equiv.</td>
<td>Concurrence requested but no response received. Will withdrawal course from minor if offering department requests such action</td>
</tr>
<tr>
<td>Sociology 302</td>
<td>Technology and Global Society</td>
<td></td>
<td>Concurrence Received 3/18/08</td>
</tr>
<tr>
<td>Capstone Experience (4-8 credits)</td>
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</tbody>
</table>
Table 3. Technological Studies Minor: Courses and Prerequisites

<table>
<thead>
<tr>
<th>Course (Credits)</th>
<th>Title</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core (9-11 credits)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG 201 (5)</td>
<td>Technological Studies I: Analyzing Our World</td>
<td>GEC Natural Science course in Biology, Chemistry or Physics</td>
</tr>
<tr>
<td>ENG 202 (5)</td>
<td>Technological Studies II: Analyzing Our World</td>
<td>ENG 201</td>
</tr>
<tr>
<td>Option 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG 181 (3)/191H (4)</td>
<td>Introduction to Engineering I/Engineering Fundamentals and Laboratory I</td>
<td>Prereq or Concur Math 150 or higher/Math 151 or higher and honors status</td>
</tr>
<tr>
<td>ENG 183 (3)/193H (4)</td>
<td>Introduction to Engineering II/Engineering Fundamentals and Laboratory II</td>
<td>ENG 181/ENG 192H</td>
</tr>
<tr>
<td>ISE 504 (3)</td>
<td>Engineering Economic Analysis</td>
<td>3rd yr standing or concur with 500 or written permission of instructor</td>
</tr>
<tr>
<td><strong>Computation Technologies (4 – 5 credits)</strong></td>
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<td></td>
</tr>
<tr>
<td>CSE 200 (5)</td>
<td>Computer Assisted Problem Solving for Business</td>
<td>Math 116, 130 or 148</td>
</tr>
<tr>
<td>CSE 201 (4)</td>
<td>Elementary Computer Programming</td>
<td>Math 075</td>
</tr>
<tr>
<td>CSE 202 (4)</td>
<td>Introduction to Programming and Algorithms for Engineers and Scientists</td>
<td>Math 151</td>
</tr>
<tr>
<td>CSE 203 (4)</td>
<td>Computational Thinking in Context: Interactive Video and Games,</td>
<td>None</td>
</tr>
<tr>
<td>CSE 204 (4)</td>
<td>Computational Thinking in Context: Digital Images and Sound</td>
<td>None</td>
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<tr>
<td><strong>Technology and Society (5 credits)</strong></td>
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<td>English 110 or equiv.</td>
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<td>Global Studies of Science and Technology</td>
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</tr>
</tbody>
</table>
Deviation from College Policy of Minor – 100 Level Courses

This proposal is seeking concurrence from approval bodies for a deviation from one specification with the College of Engineering’s Undergraduate Minor Program Policy (as Revised 9 February 2005). That is “100 level courses may not count as credit toward a minor.” This proposal includes the use of Engineering 181 and 183. A brief description of each course is given below and syllabi are included in Appendix C. Although numbered at the 100 level, these courses have content appropriate to the objectives of the proposed minors and are rigorous in their approach and could be justifiably renumbered as 200 level courses for the minor. However, this would not be desirable for the engineering curriculum structure. The math prerequisites help assure the students have the quantitative skills needed to address the topics in a rigorous fashion.

Core and Capstone Course Descriptions

ENG 181 (3) Introduction to Engineering I
Visualization and sketches, introduction to spreadsheets and CAD, working drawings, experimental design and data analysis, problem solving approaches, hands-on lab, reporting, and production dissection. Prereq or concur: Math 150 or higher

ENG 183 (3) Introduction to Engineering II
Team building, design/build project; project management, introduction to MATLAB, written and oral reports, preparation of visual aids, hands-on lab and reporting. Prereq: ENG 181 or H191.

ENG 201 (5) Technological Studies I: Analyzing Our World (New Course - Course Syllabus appended)
An introduction to technology concepts for students without extensive math or science backgrounds. Technical and practical aspects of several technology areas will be explored including design, communications, energy, and manufacturing. This course is intended for non-engineering students who want to better understand how technology impacts their lives.
**ENG 202 (5) Technological Studies II: Analyzing Our World (New Course - Course Syllabus appended)**

This is the second course in a two-course sequence which serves as an introduction to technology concepts for students without extensive math or science backgrounds. Technical and practical aspects of several technology areas will be explored including nanotechnology, bio-related technology, transportation, and construction. This course is intended for non-engineering students who want to better understand how technology impacts their lives.

**ISE 504 (3) Engineering Economic Analysis**

Economic analysis of engineering projects and methods of operation; the analysis of public investments, and introduction to analysis of engineering decisions. Prereq: 3rd yr standing or concur with 500 or written permission of instructor.

**ENG 581 (4, repeatable to 8) Engineering Capstone Collaboration**

This is a new course being developed. It is anticipated that students enrolled in this course will contract to collaborate with an existing capstone design team (within any program of the College expressing willingness to collaborate). The students will be expected to bring a disciplinary expertise outside of engineering to the project. This course is to be managed by the Engineering Education Innovation Center. A proposed course syllabus is appended.

**ENG 582 (2) Technology Issues Seminar**

This is a new course being developed. This course is intended as a culminating seminar experience for non-engineering students who are completing the Technological Studies Minor. A series of current technological issues within areas of focus of the college, (e.g. energy, transportation, environment, biomedical technologies, advanced materials) will be addressed by leading technologists. This should directly build their skills towards understanding issues of the day.

**Additional Requirements**

1. No grade below a C- will be permitted in courses comprising the minor; the minimum overall CPHR of the minor shall be 2.00.
2. No more than 10 hours of transfer credit may be applied to the minor.
3. Variations in the program are generally not permitted; any variation must be approved by the Chair of the Minors Oversight Committee.
4. Although the College of Engineering places no restrictions on use of course both in a minor and major program (double counting), students should consult their major program for any constraints that might be applied there.
5. A minor program form, to be available on College of Engineering website, must be filed at least by the time the graduation application is submitted. It requires signature by the student and student’s major program advisor. This is then submitted to the advisor for the minor program for approval. Once the minor has been filed, any changes must be approved by the Chair of the Minors Oversight Committee.
Administration and Advising

The two minors offered by the College of Engineering will be administratively supported by the Engineering Education Innovation Center (EEIC). The EEIC Director (or designee of the Director) will chair of the Minors Oversight Committee, assure the advising of students, certification of completion, review of courses and be responsible for on-going development of the minor. This oversight committee will report to the Core Curriculum and College Services Committee of the College (acting as curriculum committee for both minors.)

Estimates of Student Interest and Needed Instructional Resources

Although difficult to anticipate, demand for the two minors is initially projected at 50 to 75 students per year for each minor. This would likely necessitate an additional section of the ENG 181, 183 sequence. Enrollment in the two new courses suggested for the core of the Technological Studies minor may be impacted by pending consideration of GEC requirements for ASC students and approval of the courses for GEC credit. It is anticipated that space and laboratory needs for the additional sections of ENG 181/183 and the new courses will be accommodated through the First-Year Engineering program of the College.

Staffing of the Core course can be accomplished through the current First-Year Engineering Program (FEP). FEP will be responsible for staffing, space and equipment needs for the courses. As interest in the course develops, it is anticipated that the fiscal resources generated will be adequate to cover the additional expenses. For the elective elements of the minors, the additional student demand in specific courses should not be a constraint.

Student Learning Outcome Assessment Plan

The Minors Oversight Committee will be charged with assuring the assessment of student learning outcomes. The EEIC will administer a minor completion survey. The survey will explore student perceptions of: 1) the attainment of the learning goals indicated for the minor, and 2) structure, availability, and appropriateness of courses in the minor. This data, along with enrollment data, will be reviewed annually by the oversight committee.

Implementation Date

The minors are proposed for implementation in Winter Quarter of 2009.

Appendices

Appendix A – Core Course Syllabi
Appendix B – Letters of Concurrence
Appendix C – Reduced Sample Syllabi for ENG 181 and 183
**OHIO STATE NEW COURSE REQUEST**

College: Engineering  
Academic unit: Engineering  
Book 3 Listing: Engineering  
(e.g., Portuguese)

Proposed Course No: 201  
Full Title of Course: Technologies Studies I: Analyzing Our World

Proposed Effective Qtr/Yr:  
SU ☐ AU ☐ WI ☑ SP ☑ YEAR: 2009  
(See OAA Academic Organization and Curriculum Handbook for Deadlines)


**Is this a course with decimal subdivisions?** If so, use one New Course Request form for the generic information that will apply to all subdivisions. Use separate forms for each new decimal subdivision, including on each form only the information that is unique to that subdivision.

18-Character Transcript Abbreviation: Tech Studies I  
Level U ☑ G ☐ P ☐ Credit Hours: 5

Description (*not to exceed 25 words*): Introduction to technology concepts for students without extensive math or science backgrounds. Course explores aspects of design, communications, energy, and manufacturing.

Quarter offered (*check*): SU ☐ AU ☐ WI ☑ SP ☐  
*Distribution of class time/contact hours: _2 1.5 hr Cl; 1 2hr L_____  
Quarter and contact/class time hours information should be omitted from Book 3 publication: (check here) ☐

Prerequisite (s): GEC Natural Science course in Biology, Chemistry or Physics

Exclusion or limiting clause: Not open to Engineering Majors

Repeatable to a maximum of ___ credit hours.

Cross-listed with:

Grade Option (Please check): Letter ☑ S/U ☐ Progress ☐

If this course is Progress graded, what course is the last one in the series?

Honors Statement: Yes ☑ No ☐ GEC: Yes ☑ No ☐ Admission

Condition Off-Campus: Yes ☑ No ☐ EM: Yes ☑ No ☐ Course: Yes ☑

No X ☐

Embedded Honors Statement: Yes ☑ No ☐

Service Learning Course*: Yes ☑ No ☐

*To learn more about this option, please visit [http://artsandsciences.osu.edu/currofc/](http://artsandsciences.osu.edu/currofc/)

Other General Course Information:  
(e.g. “Taught in English.” “Credit does not count toward BSBA degree.”)

Subject Code_150000_  
Subsidy Level (V, G, T, B, M, D, or P) ☑ B

(If you have questions please email Jed Dickhaut @ dickhaut.1@osu.edu)

Will course be taught in distance learning format: Yes ☑ No ☐

**B. General Information:**

1. Provide the rationale for proposing this course:  
First of two core courses for proposed technological studies minor.
2. List Major/Minor affected by the creation of this new course. Attach revisions of all affected programs.
   This course is (check one) Required ☑ Elective ☐ Other (Explain) ☐.
   * If the course offered is less than quarter, term, or semester, please also complete the Flexibly Scheduled/Off Campus/Workshop Request form.

3. Indicate the nature of the program adjustments, new funding, and/or withdrawals that make possible the implementation of this new course.
   New course offering to be funded by College of Engineering.

4. Is the approval of this request contingent upon the approval of other course requests or curricular requests?
   Yes ☑ No ☐ List: Technological Studies Minor; ENG 202, ENG 582

5. If this course is part of a sequence, list the number of the other course(s) in the sequence: ENG 202

6. Expected section size: 50 Proposed number of sections per year: 2

7. Do you want prerequisites enforced electronically? (See OAA Curriculum Manual for what can be enforced.) Yes ☑ No ☐

8. This course has been discussed with and has the concurrence of the following academic units needing this course or with academic units having directly related interests (List units and attach letters and/or forms): Not Applicable ☑

9. Attach a course syllabus that includes a topical outline of the course, student learning outcomes and/or course objectives, off-campus field experience, methods of evaluation, and other items as stated in the OAA Curriculum Handbook.

**********************************************************************************
APPROVAL SIGNATURES (As needed. All signatures on lines in ALL CAPS (e.g. ACADEMIC UNIT) must be completed

<table>
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<tr>
<th>Academic Unit Undergraduate Studies Committee Chair (Undergraduate course)</th>
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<tr>
<td>School /College Undergrad Curriculum Committee (Undergraduate/Graduate course)</td>
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<td>ASC Curriculum Committee Chair (If Appropriate))</td>
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<td>University Honors Center (If Appropriate)</td>
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<td>Office of International Education (study tour only)</td>
<td>Printed Name</td>
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<tr>
<td>ACADEMIC AFFAIRS</td>
<td>Printed Name</td>
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ENGINEERING 201
Technological Studies I: Analyzing Our World

Core Course: Technological Studies Minor

Description: Introduction to technology concepts for students without extensive math or science backgrounds. Course explores aspects of design, communications, energy, and manufacturing.

Level, Credits: U5

Class Time Distribution: Two 1.5 lectures and one 2 hr lab

Prerequisites: GEC Natural Science course in Biology, Chemistry or Physics

Quarters Offered: TBD

General Information: This course is intended for non-engineering students who want to prepare for careers in which technological understand is beneficial and for better understand how technology impacts their lives. Content is based on national standards for technological literacy (ITEA).

Exclusions: Not open to Engineering Majors

Cross-Listings: None

Learning Outcomes: To provide students, without a strong technical background, a working understanding of how technology impacts their lives. There are both positive and negative consequences of technology on society. The students will learn to research topics of technology challenges, critically evaluate multiple points of view, and develop a conclusion based upon the best current information. The course will contain weekly laboratories which allow for hands-on experiences with varied forms of technology and products to insure a practical understanding.


Topics (including approximate duration, adding up to the course length in classroom hours or weeks):
Technology Fundamentals 1.5 hr
The Engineering Design Process 1.5 hr
Communications Fundamentals 1.5 hr
Information Technology 1.5 hr
Electronic Communication 1.5 hr
Graphic Communication 1.5 hr
Energy & Power Fundamentals 1.5 hr
Energy Sources & Conversions 1.5 hr
Power Systems 1.5 hr
Materials Properties and Uses 1.5 hr
Manufacturing Engineering Fundamentals 1.5 hr
Product Development 1.5 hr
Production Planning & Production 1.5 hr
High-Performance Manufacturing 1.5 hr
Oral Presentations (Describing the design/operating principles of chosen project) 3.0 hrs

Representative Lab Assignments:
Bridge Construction 2 hrs
Bridge Testing Competition 2 hrs
Beam Bending 2 hrs
Basic Electronics 2 hrs
Analog and Digital Circuits 2 hrs
Sensors and Measurements 2 hrs
Actuators 2 hrs
Kodak Camera Manufacturing 2 hrs

**Grading Plan:**
- Midterm 25%
- Final 25%
- Lab Projects 30%
- Oral Presentation 10%
- Quizzes 5%
- Practicum 5%

**Relationship to ABET Criterion 3 Outcomes (a-k):** N/A

**Relationship to ABET-Accredited Program Outcomes:** N/A

**Preparer Information** (including date of preparation): B. Trott, R. Gustafson, 11/6/07
OHIO STATE NEW COURSE REQUEST

College: Engineering

Academic unit: Engineering Book 3 Listing: Engineering (e.g., Portuguese)

Proposed Course No: 202 Full Title of Course: Technologies Studies II: Analyzing Our World

Proposed Effective Qtr/Yr: SU AU WI SP YEAR: 2009 X (See OAA Academic Organization and Curriculum Handbook for Deadlines)


Is this a course with decimal subdivisions? If so, use one New Course Request form for the generic information that will apply to all subdivisions. Use separate forms for each new decimal subdivision, including on each form only the information that is unique to that subdivision.

18-Character Transcript Abbreviation: Tech Studies II Level: U X G P Credit Hours: 5

Description (not to exceed 25 words):

Introduction to technology concepts for students without extensive math or science backgrounds. Course explores aspects of design, communications, energy, and manufacturing.

Quarter offered (check): SU AU WI SP X 1.5 hr Cl; 1 2hr L

Distribution of class time/contact hours: __4__

Quarter and contact/class time hours information should be omitted from Book 3 publication: (check here) 

Prerequisite (s): ENG 201

Exclusion or limiting clause: Not open to Engineering Majors

Repeatable to a maximum of ____ credit hours.

Cross-listed with:

Grade Option (Please check): Letter X S/U Progress

If this course is Progress graded, what course is the last one in the series?

Honors Statement: Yes No X GEC: Yes No X Admission

Condition Off-Campus: Yes No X EM: Yes No X Course: Yes No

No X Embedded Honors Statement: Yes No X

Service Learning Course*: Yes No X

*To learn more about this option, please visit http://artsandsciences.osu.edu/currofc/

Other General Course Information:

Subject Code: 150000 Subsidy Level (V, G, T, B, M, D, or P): B

(If you have questions please email Jed Dickhaut @ dickhaut.1@osu.edu)

Will course be taught in distance learning format: Yes No X

B. General Information:

1. Provide the rationale for proposing this course:
Second of two core courses for proposed technological studies minor.

2. List Major/Minor affected by the creation of this new course. Attach revisions of all affected programs.
   This course is (check one) Required ☑ Elective ☐ Other (Explain) ☐
   * If the course offered is less than quarter, term, or semester, please also complete the Flexibly Scheduled/Off
     Campus/Workshop Request form.

3. Indicate the nature of the program adjustments, new funding, and/or withdrawals that make possible the implementation
   of this new course.
   New course offering to be funded by College of Engineering.

4. Is the approval of this request contingent upon the approval of other course requests or curricular requests?
   Yes ☑ No ☐ List: Technological Studies Minor; ENG 201, ENG 582

5. If this course is part of a sequence, list the number of the other course(s) in the sequence: ENG 201

6. Expected section size: 50   Proposed number of sections per year: 2

7. Do you want prerequisites enforced electronically? (See OAA Curriculum Manual for what can be enforced.) Yes ☑

8. This course has been discussed with and has the concurrence of the following academic units needing this course or with
   academic units having directly related interests (List units and attach letters and/or forms): Not Applicable ☑

9. Attach a course syllabus that includes a topical outline of the course, student learning outcomes and/or course objectives,
   off-campus field experience, methods of evaluation, and other items as stated in the OAA Curriculum Handbook.

**************************************************************************************************************************************************

APPROVAL SIGNATURES (As needed. All signatures on lines in ALL CAPS (e.g. ACADEMIC UNIT) must be completed

__________________________________________  ____________________________
Academic Unit Undergraduate Studies Committee Chair (Undergraduate course)  Printed Name Date

__________________________________________  ____________________________
Academic Unit Graduate Studies Committee Chair(Undergraduate/Graduate course)  Printed Name Date

__________________________________________  ____________________________
School /College Undergrad Curriculum Committee (Undergraduate/Graduate course)  Printed Name Date

__________________________________________  ____________________________
School /College Graduate Curriculum Committee (Undergraduate/Graduate course)  Printed Name Date

__________________________________________  ____________________________
ACADEMIC UNIT CHAIR /SCHOOL DIRECTOR  Printed Name Date

__________________________________________  ____________________________
COLLEGE DEAN  Printed Name Date

__________________________________________  ____________________________
Graduate School (If Appropriate)  Printed Name Date

__________________________________________  ____________________________
ASC Curriculum Committee Chair (If Appropriate))  Printed Name Date

__________________________________________  ____________________________
University Honors Center (If Appropriate)  Printed Name Date

__________________________________________  ____________________________
Office of International Education (study tour only)  Printed Name Date

__________________________________________  ____________________________
ACADEMIC AFFAIRS  Printed Name Date
**ENGINEERING 202**  
**Technological Studies II: Analyzing Our World**

**Core Course:** Technological Studies Minor

**Description:** Introduction to technology concepts for students without extensive math or science backgrounds. Course explores aspects of nanotechnology, bio-related technology, transportation, and construction.

**Level, Credits:** U5

**Class Time Distribution:** Two 1.5 lectures and one 2 hr lab

**Prerequisites:** Engineering 201

**Quarters Offered:** TBD

**General Information:** Continuation of ENG 201. This course is intended for non-engineering students who want to prepare for careers in which technological understand is beneficial and for better understand how technology impacts their lives. Content is based on national standards for technological literacy (ITEA).

**Exclusions:** Not open to Engineering Majors

**Cross-Listings:** None

**Learning Outcomes:** To provide students, without a strong technical background, a working understanding of how technology impacts their lives. There are both positive and negative consequences of technology on society. The students will learn to research topics of technology challenges, critically evaluate multiple points of view, and develop a conclusion based upon the best current information. The course will contain weekly laboratories which allow for hands-on experiences with varied forms of technology and products to insure a practical understanding.

**Textbooks and Other Materials:** “Technology Engineering and Design”, Glencoe/McGraw Hill, 2008

**Topics** (including approximate duration, adding up to the course length in classroom hours or weeks):
- Construction Fundamentals 1.5 hr
- Planning Construction 1.5 hr
- Managing Construction 1.5 hr
- Constructing Buildings 1.5 hr
- Large Scale Construction 1.5 hr
- Transportation Fundamentals 1.5 hr
- Structure of Transportation 1.5 hr
- Powering Transportation 1.5 hr
- Bio-related Fundamentals 1.5 hr
- Medical Technologies 1.5 hr
- Agricultural Technologies 1.5 hr
- Nanotechnology 1.5 hr

**Representative Lab Assignments (Tentative):**
- Electrical Power Technology
  - Principles of switching and control
  - Residential wiring systems
Advanced energy technology for residences
Transportation
  Traffic Analysis
  Automotive energy analysis
  Developing automotive technologies
Communications and Networks
  Networking computers
  Internet structure

Quarter Long Project: Develop a position paper and oral presentation related to a current technology related topic (e.g. global warming, use of fossil fuels, alternative energy, world hunger)

Grading Plan:
Midterm 25%
Final 25%
Lab Projects 15%
Homework 10%
Quarter Long Project 25%

Relationship to ABET Criterion 3 Outcomes (a-k): N/A

Relationship to ABET-Accredited Program Outcomes: N/A

Preparer Information (including date of preparation): B. Trott, R. Gustafson, 11/5/07
OHIO STATE NEW COURSE REQUEST

College: Engineering

Academic unit: Engineering

Proposed Course No: 581

Full Title of Course: Engineering Capstone Collaboration

Proposed Effective Qtr/Yr: SU AU WI SP YEAR: 2009

(ASee OAA Academic Organization and Curriculum Handbook for Deadlines)


Is this a course with decimal subdivisions? If so, use one New Course Request form for the generic information that will apply to all subdivisions. Use separate forms for each new decimal subdivision, including on each form only the information that is unique to that subdivision.

18-Character Transcript Abbreviation: Eng Capstone Coll

Credit

Description (not to exceed 25 words):

Students contract to collaborate with an engineering capstone design team for at least one quarter and contribute their disciplinary expertise.

Quarter offered (check): SU AU WI SP *

Distribution of class time/contact hours:

Arr

Quarter and contact/class time hours information should be omitted from Book 3 publication: (check here)

Prerequisite(s): Engineering Departmental Permission

Exclusion or limiting clause: Not open to Engineering Majors

Repeatable to a maximum of 8 credit hours.

Cross-listed with:

Grade Option (Please check): Letter S/U Progress

If this course is Progress graded, what course is the last one in the series?

Honors Statement: Yes No X

Condition

Off-Campus: Yes No X

EM: Yes No X

Course: Yes No X

No X

Embedded Honors Statement: Yes No X

Service Learning Course*: Yes No X

*To learn more about this option, please visit http://artsandsciences.osu.edu/currofc/

Other General Course Information:

(e.g., “Taught in English.” “Credit does not count toward BSBA degree.”)

Subject Code 150000 Subsidy Level (V, G, T, B, M, D, or P) B

(If you have questions please email Jed Dickhaut @ dickhaut.1@osu.edu)

Will course be taught in distance learning format: Yes No X

B. General Information:


1. Provide the rationale for proposing this course: Capstone requirement within Engineering Sciences minor

2. List Major/Minor affected by the creation of this new course. Attach revisions of all affected programs.
   This course is (check one): Required [X] Elective [ ] Other (Explain) [ ]
   * If the course offered is less than quarter, term, or semester, please also complete the Flexibly Scheduled/Off Campus/Workshop Request form.

3. Indicate the nature of the program adjustments, new funding, and/or withdrawals that make possible the implementation of this new course.
   New course offering to be funded by College of Engineering.

4. Is the approval of this request contingent upon the approval of other course requests or curricular requests?
   Yes [X] No [ ] List: Engineering Sciences Minor

5. If this course is part of a sequence, list the number of the other course(s) in the sequence: ________________________

6. Expected section size: 20 Proposed number of sections per year: 3

7. Do you want prerequisites enforced electronically? (See OAA Curriculum Manual for what can be enforced.) Yes [X] No [ ]

8. This course has been discussed with and has the concurrence of the following academic units needing this course or with academic units having directly related interests (List units and attach letters and/or forms): Not Applicable [X]

9. Attach a course syllabus that includes a topical outline of the course, student learning outcomes and/or course objectives, off-campus field experience, methods of evaluation, and other items as stated in the OAA Curriculum Handbook.

________________________________________________________________________________________________________

APPROVAL SIGNATURES (As needed. All signatures on lines in ALL CAPS (e.g. ACADEMIC UNIT) must be completed)

Academic Unit Undergraduate Studies Committee Chair (Undergraduate course) Printed Name Date

Academic Unit Graduate Studies Committee Chair (Undergraduate/Graduate course) Printed Name Date

School/College Undergrad Curriculum Committee (Undergraduate/Graduate course) Printed Name Date

School/College Graduate Curriculum Committee (Undergraduate/Graduate course) Printed Name Date

ACADEMIC UNIT CHAIR/SCHOOL DIRECTOR Printed Name Date

COLLEGE DEAN Printed Name Date

Graduate School (If Appropriate) Printed Name Date

ASC Curriculum Committee Chair (If Appropriate)) Printed Name Date

University Honors Center (If Appropriate) Printed Name Date

Office of International Education (study tour only) Printed Name Date

ACADEMIC AFFAIRS Printed Name Date
ENGINEERING 581
Engineering Capstone Collaboration

Core Course: Engineering Sciences Minor

Description: Students contract to collaborate with an engineering capstone design team for at least one quarter and contribute their disciplinary expertise.

Level, Credits: U 2 – 4 repeatable up to 8 credits

Class Time Distribution: Arranged in conjunction with an Engineering Capstone Course

Prerequisites: Engineering Departmental Permission

Quarters Offered: AU, WI, SP

General Information: This course is intended as a capstone experience for non-engineering students who are completing the Engineering Sciences Minor. The capstone class for the minor gives the student direct experience working as part of an engineering design team. This should directly build their skills towards the objective of being able to work effectively with technological experts.

Course will be coordinated by the Director of the Engineering Education Innovation Center or the Director’s designee. Students will develop a course contract in conjunction with the course coordinator (Director EEIC or Director’s designee), the design course coordinator and the capstone design team.

Exclusions: Not open to Engineering Majors

Cross-Listings: None

Learning Outcomes:

The students are expected to 1) experience the process of participating in decisions about the development and use of technology, 2) further their appreciation for the development and use of technology involving trade-offs and a balance of costs and benefits, 3) be able to asks pertinent questions of self and others regarding the benefits and risks of technologies, and 4) enhance multi-disciplinary teamwork skills.

Textbooks and Other Materials: NA

Topics: To be determined, dependent on design project.

Grading Plan: Students will develop a course contract in conjunction with the course coordinator (Director EEIC or Director’s designee), the design course coordinator and the capstone design team. Each contract will specify the grading plan that will be used for the student’s undertaking.

Relationship to ABET Criterion 3 Outcomes (a-k): N/A

Relationship to ABET-Accredited Program Outcomes: N/A

Preparer Information (including date of preparation): R. Gustafson, 12/7/07
OHIO STATE NEW COURSE REQUEST

College: Engineering

Academic unit: Engineering Book 3 Listing: Engineering

Proposed Course No: 582 Full Title of Course: Technology Issues Seminar

Proposed Effective Qtr/Yr: SU □ AU □ WI □ SP □ YEAR: 2009 (See OAA Academic Organization and Curriculum Handbook for Deadlines)


Is this a course with decimal subdivisions? If so, use one New Course Request form for the generic information that will apply to all subdivisions. Use separate forms for each new decimal subdivision, including on each form only the information that is unique to that subdivision.

18-Character Transcript Abbreviation: Tech Issues Sem Level U □ G □ P □ Credit Hours: 2

Description (not to exceed 25 words): Lecture and discussion of current technological issues and their implications presented by leading experts in the area. Builds understanding of issue for informed citizenship.

Quarter offered (check): SU □ AU X □ WI X □ SP □ *Distribution of class time/contact hours: __1 2hr Cl □_______

Quarter and contact/class time hours information should be omitted from Book 3 publication: (check here) □

Prerequisite(s): ENG 183 or ENG 193H or ENG 185 or ENG 202

Exclusion or limiting clause:

Repeatable to a maximum of ___ credit hours.

Cross-listed with:

Grade Option (Please check): Letter X □ S/U □ Progress □

If this course is Progress graded, what course is the last one in the series?

Honors Statement: Yes □ No X □ GEC: Yes □ No X □ Admission

Condition

Off-Campus: Yes □ No X □ EM: Yes □ No X □ Course: Yes □

No X □

Embedded Honors Statement: Yes □ No X □

Service Learning Course*: Yes □ No X □

*To learn more about this option, please visit http://artsandsciences.osu.edu/currofc/

Other General Course Information:

(e.g. “Taught in English.” “Credit does not count toward BSBA degree.”)

Subject Code __150000________________________ Subsidy Level (V, G, T, B, M, D, or P) __B________________________

(If you have questions please email Jed Dickhaut @ dickhaut.1@osu.edu)

Will course be taught in distance learning format: Yes □ No X □

B. General Information:
1. Provide the rationale for proposing this course:
Requirement within Technological Studies minor

2. List Major/Minor affected by the creation of this new course. Attach revisions of all affected programs.
   This course is (check one)  Required  X  Elective  ☐  Other (Explain)  ☐
   * If the course offered is less than quarter, term, or semester, please also complete the Flexibly Scheduled/Off
   Campus/Workshop Request form.

3. Indicate the nature of the program adjustments, new funding, and/or withdrawals that make possible the implementation
   of this new course.
   New course offering to be funded by College of Engineering.

4. Is the approval of this request contingent upon the approval of other course requests or curricular requests?
   Yes  X  No  ☐  List: Technological Studies Minor

5. If this course is part of a sequence, list the number of the other course(s) in the sequence:

6. Expected section size: 50   Proposed number of sections per year: 2

7. Do you want prerequisites enforced electronically?  (See OAA Curriculum Manual for what can be enforced.)  Yes  X  No  ☐

8. This course has been discussed with and has the concurrence of the following academic units needing this course or with
   academic units having directly related interests (List units and attach letters and/or forms):  Not Applicable  X  ☐

9. Attach a course syllabus that includes a topical outline of the course, student learning outcomes and/or course
   objectives, off-campus field experience, methods of evaluation, and other items as stated in the
   OAA Curriculum Handbook.

******************************************************************************
APPROVAL SIGNATURES  (As needed. All signatures on lines in ALL CAPS (e.g. ACADEMIC UNIT) must be completed

Academic Unit Undergraduate Studies Committee Chair (Undergraduate course)  Printed Name  Date

Academic Unit Graduate Studies Committee Chair (Undergraduate/Graduate course)  Printed Name  Date

School /College Undergrad Curriculum Committee (Undergraduate/Graduate course)  Printed Name  Date

School /College Graduate Curriculum Committee (Undergraduate/Graduate course)  Printed Name  Date

ACADEMIC UNIT CHAIR/SCHOOL DIRECTOR  Printed Name  Date

COLLEGE DEAN  Printed Name  Date

Graduate School (If Appropriate)  Printed Name  Date

ASC Curriculum Committee Chair (If Appropriate)  Printed Name  Date

University Honors Center (If Appropriate)  Printed Name  Date

Office of International Education (study tour only)  Printed Name  Date

ACADEMIC AFFAIRS  Printed Name  Date
ENGINEERING 582
Technology Issues Seminar

Core Course: Technology Studies Minor

Description: Lecture and discussion of current technological issues and their implications presented by leading experts in the area. Builds understanding of issue for informed citizenship.

Level, Credits: U 2

Class Time Distribution: 1 2hr cl

Prerequisites: ENG 183 or ENG 193H or ENG 185 or ENG 202

Quarters Offered: TBD

General Information: This course is intended as a culminating seminar experience for non-engineering students who are completing the Technological Studies Minor. A series of current technological issues within areas of focus of the college, (e.g. energy, transportation, environment, biomedical technologies, advanced materials) will be addressed by leading technologist. This should directly build their skills towards understanding issues of the day.

Course will be coordinated by the Director of the Engineering Education Innovation Center or the Director’s designee. Students will be expected to write 1-2 page reflection papers for the seminars. Students will be expected to develop a written position piece on a current technological issue approved by the instructor.

Exclusions: None

Cross-Listings: None

Learning Outcomes:

The students are expected to 1) recognize the nature and complexity of current technological issues, 2) further their appreciation for the development and use of technology involving trade-offs and a balance of costs and benefits, 3) be able to asks pertinent questions of self and others regarding the benefits and risks of technologies, and 4) enhance written communication skills.

Textbooks and Other Materials: NA

Topics: To be determined, dependent on design project.

Grading Plan:

<table>
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<tr>
<th>Reflection Papers (8-10)</th>
<th>50%</th>
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<tbody>
<tr>
<td>Issue Paper</td>
<td>50%</td>
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</table>

Relationship to ABET Criterion 3 Outcomes (a-k): N/A

Relationship to ABET-Accredited Program Outcomes: N/A

Preparer Information (including date of preparation): R. Gustafson, 2/27/08
Concurrence and Letters of Support

1. College of Food, Agricultural and Environmental Sciences – requested response to draft proposal

Response to an earlier draft proposal, received 12/21/07

Bob: Sorry for the delay but let me respond to your minor proposals. We think the minors are a good idea and can be attractive to many groups of students. I am assuming that Engineering majors can not select either minor since you have exclusion clauses on the new courses. The only suggestion is remove the Natural Science requirement. This should be a prerequisite for the minor similar to the Engineering Sciences minor. Many students take these courses already as a Natural Science. There already may be overlap in the Technology and Society with CS 272, Eng 360.02, 367 and History 362. To replace those hours you might have select two courses from Computational Studies.

Thanks for the opportunity to review the proposals. Enjoy the holiday season.

Jill A. Pfister
Assistant Dean, Academic Affairs
Honors Director and College Secretary

*Note suggestion on Natural Science has been implemented in the current proposal.

2. Fisher College of Business– requested response to draft proposal

Bob,

I reviewed this quickly, and Rao will need to respond to this, but I have some questions/observations of note:

1) The pre-req for ENG 181 is Math 150 or higher. While about 25% or so of BUS students take (or at least start) the 150’s series or higher, most do not. I assume that 131 as indicated elsewhere in the proposal will be sufficient, but note that students who start at Math 130 will not necessarily have had any trig or analytic (but likely will have had some exposure to it in high school if they took pre-calc).*

2) Many of the Engineering Science options will require careful planning by students to ensure that they have the right math and/or science, but I note that there are several options with minimal pre-reqs that can be taken for those who make late decisions and/or have not planned anticipating the minor.

3) I am curious how you see students positioning the minor in their program, e.g. whether you see them beginning as freshmen, sophomores, etc., both from ideal and realistic perspectives.

It’s probably obvious that my bias for our students is toward Engineering Science rather than Technological Studies, but overall, I think the minor proposals would provide attractive opportunities for our students. As I mentioned to you, we have interests in identifying enriching opportunities for our students in product design and science areas, among others, and I think your proposal particularly for the ES minor is certainly one way to address those interests at some level.

One more question: I assume that students can double count courses in the minors and general education where those opportunities present themselves (such as 2nd writing, lit, or history)?*
Thanks.
Jay Yutzey

*Note these two concerns have been addressed by changes/additions to the proposal.

3/19/08
Bob,

This proposal is a very good one and the Undergraduate Program at Fisher is excited about the possibility of some of our students getting their minor in Engg. Science. Please let us know if we can help in any way as the minor unfolds. Thanks.

Rao Unnava

3. Colleges of the Arts and Sciences – requested response to draft proposal through Ed Adelson

Request for input made 12/11/07;

4. College of Education and Human Ecology – Concurrence for inclusion of Ed T & L 220

We are willing to include Ed T and L 220 in the proposed structure of your minor in technological literacy.

Let me know how we can be of further help.

Rebecca Kantor
Director, School of Teaching and Learning

Use of Eng 183 as prerequisite for T&L 220

Bob,
I did not get the attachments but I have no problem using 183 as a prerequisite. I could also add 181 if that would help. If the students interested in 220 would have already had 183 anyway that it doesn’t matter.

Paul (Paul Post)

5. Department of History – Concurrence for inclusion of History 362

Request for concurrence made 2/6/08;

6. Department of Comparative Studies – Concurrence for inclusion of Comp Studies 272

3/18/08
... we are happy to have our courses included in the proposal.

David G. Horn, Professor and Chair
Department of Comparative Studies

7. Department of Industrial, Interior, and Visual Communication Design – concurrence for inclusion of II&VCD 230

Request for concurrent sent 11/6/07; Second request sent 2/6/08;
8. Sociology

The idea of including Soc 302 in the minor list is excellent.

I would assume at least initially the number of new student requests for Soc 302 would be limited but, with time, it might grow. This is quite sustainable.

Let me know if you need a formal letter of endorsement or if this email suffices.
J. Craig Jenkins
Chair of Sociology & Professor of Sociology and Political Science 300 Bricker/190 N. Oval Mall Ohio State

9. Physics Department

Request for concurrence made 3/14/08;
ENGINEERING 181-WINTER QUARTER 2008
Fundamentals of Engineering - I
Classrooms: HI 224  Laboratories: HI 214 – HI 216  Computer HI 342

**Course Objectives:** The goal of this course is to provide you with knowledge of engineering fundamentals: graphics, technical communications, problem solving, the design process, data collection and data analysis. The goal of the two-course sequence is to expand that knowledge to a point of maximum usefulness with respect to both your future academic work and professional career. This course is divided into two segments: (1) Basic Skills and (2) Hands-on Laboratory.

**Basic Skills:** Each week, you will be introduced to important engineering skills and given an opportunity to practice those skills. Homework assignments will be made in each session and will be due on the date indicated on the Daily Assignment List. Assignments received more than one session late will be marked but will not earn credit. One mid-term exam and one final exam will be given. Exams are given closed book, closed notes, closed outside resources unless otherwise stated at the time of the exam. Note: No food or beverages are allowed in the classrooms or labs.

**Hands-On Laboratory:** Each week students will attend a 2-hour Hands-on Laboratory session. There will be three sets of labs. The first set, Fundamental Concepts, consists of labs 2, 3, and 4. The second set, Transport Phenomena, consists of labs 5 and 6. The third set, Camera Labs, consists of labs 7, 8, & 9. During the 10th and final lab, each team will make an oral presentation on an engineering design project. During the laboratory sessions, students will perform a variety of hands-on activities including disassembling and reassembling objects, testing components, and collecting and analyzing data. Homework assignments will include gathering additional information from the internet or library, solving problems related to the lab work, and preparing lab reports. Students will also prepare and present an oral report. Each assignment will be graded. Questions on important concepts covered in the laboratories will be included on the final exam. There may be time in the second half of your two-hour Basics sessions for teams to work on lab reports and pre-lab work, where required.

**Grading:** The contribution of each course segment to the overall course grade is outlined below.

<table>
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<tr>
<th>Segment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Basic Skills</td>
<td>25%</td>
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<td>Daily Assignments</td>
<td>25%</td>
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<td>Labs</td>
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<td>Individual Labs</td>
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<td>Team Labs</td>
<td>12%</td>
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<td>Engineering Discipline Project</td>
<td>6%</td>
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<td>Exams (Basics and Labs)</td>
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<td>Midterm</td>
<td>20%</td>
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<td>Final</td>
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<td>Final Team Evaluations</td>
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<td>Journal Entries</td>
<td>1%</td>
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<td>Attendance</td>
<td>1%</td>
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<td>Creativity in Engineering</td>
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<td>Design Assessment (Bonus)</td>
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**Assessment and Evaluation:** Individual and team-based evaluations will be conducted throughout the quarter. Electronic journal entries are required and factored into the course grade. The final team evaluation results will also be a factor in assigning a final team grade.

**Course Materials:** The following materials are required for this course:

- Books (At OSU Bookstores)
- A Guide to Writing as an Engineer by David Beer & David McMurrey
- “Tools and Tactics of Design”, by Dominick, et al
- "An Introduction to Autodesk Inventor 2008 and AutoCAD 2008", by Shih, Schroff

- **Engineering 181 Student Course Packet** (*Purchased at Tuttle Uniprint*)
  (contains all drawing assignments & necessary lab materials)

- **Storage Medium** – USB flash drives (preferred) or 3.5" High Density disks. **Note:** 3GB storage space on a network drive accessible by FTP (File Transfer Protocol) from outside of class is provided by the First-Year Engineering Program.

- **Mechanical pencil, eraser, 6" scale (inches and metric)**

- **AutoDesk Inventor® Professional 2008 (provided by the First-Year Engineering Program)**

**CAD Computer Graphics Lab:** In addition to your classrooms and labs, you will have access to the Hitchcock Computer Graphics Lab (HCGL) located in Hitchcock Hall Room 342. For the most up to date schedule, please consult postings outside the room. You are to use only the software supplied in these labs; that is, you may not install any software onto, or copy any software from the lab computers. **Food and drink are not permitted in the lab.** Violation of these policies will result in expulsion from the lab.

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**Accreditation Board for Engineering and Technology - Program Criteria 2000:**

Engineering programs must demonstrate that their graduates have:

(a) an ability to apply knowledge of mathematics, science, and engineering  
X
(b) an ability to design and conduct experiments, as well as to analyze and interpret data 
X
(c) an ability to design a system, component, or process to meet desired needs 
X
(d) ability to function on multi-disciplinary teams 
X
(e) an ability to identify, formulate, and solve engineering problems  
X
(f) an understanding of professional and ethical responsibility  
X
(g) an ability to communicate effectively  
X
(h) the broad education necessary to understand the impact of engineering solutions in 
  a global and societal context 
X
(i) a recognition of the need for, and an ability to engage in life-long learning 
X
(j) a knowledge of contemporary issues 
X
(k) an ability to use the techniques, skills, and modern engineering tools necessary 
  for engineering practice  
X

*ENG181 ascribes to the criteria as marked with an "X"
# Daily Assignment List

**Engineering 181 WI08 – Section 7A Only (no Section 7B)**

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Session</th>
<th>Session Topic(s)</th>
<th>Reading</th>
<th>Assigned Work</th>
<th>Assignments Due</th>
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<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>4</td>
<td>Basics 3</td>
<td>Course Introduction / Excel - Graphing; Excel - Data Analysis</td>
<td>TG Ch. 12.1 - 12.2.3; WE Ch. 7</td>
<td>Purdue Visualization Test (pre - online); Group Creation Survey*; Learning Styles Inventory; Read Significant Figures Module (Carmen Content); Excel 1, 2, &amp; 3</td>
<td>Group Creation Survey*</td>
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<td>2</td>
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<td>7</td>
<td>Basics 4</td>
<td>Sketching and Isometric Pictorials / Oral Presentation: Engineering Product / Team Building</td>
<td>TG Ch. 2 TTD Ch. 3 + 5.3</td>
<td>DWG 1*; Email Oral Presentation Topic; Quiz on Significant Figures; Team Working Agreement; Journal Entry #1</td>
<td>DWG 1*; Read Significant Figures Module; Learning Styles Inventory</td>
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<td>W</td>
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<td>Lab 2</td>
<td>Fundamental Concepts A (Beam Bending)</td>
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<td>Lab 2 Memo (individual - paper)</td>
<td>Quiz on Significant Figures; Email Oral Presentation Topic</td>
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<td>Basics 5</td>
<td>Inventor: Getting Started</td>
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<td>INV 1*, INV 2; Schedule Research Meeting</td>
<td>INV 1*; Excel 1, 2, &amp; 3; Purdue Visualization Test (pre - online); Journal Entry #1</td>
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<td>The Isometric Ellipse</td>
<td>TG Ch. 4</td>
<td>DWG 2*</td>
<td>DWG 2*</td>
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<td>Lab 3</td>
<td>Fundamental Concepts B (Static/Dynamic Meas.)</td>
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<td>Lab 3 Memo (team - electronic)</td>
<td>Lab 2 Memo (individual - paper); Team Working Agreement</td>
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<td>Basics 7</td>
<td>Orthographic Projections</td>
<td>TG Ch. 3</td>
<td>DWG 3*</td>
<td>INV 2; DWG 3*</td>
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<td>Lab 4</td>
<td>Fundamental Concepts C (Bridge Competition / Reverse Engineering)</td>
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<td>Lab 4 Memo (team - electronic); Lab 2 Memo Rewrite (paper - include original)</td>
<td>Lab 3 Memo (team - electronic)</td>
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<td>Day</td>
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<td>Basics 9</td>
<td>Inventor: Constructive Solid Geometry &amp; Model History Tree</td>
<td>INV 3*, INV 4, INV 5; Mid-quarter Team Evaluation</td>
<td>INV 3*; Journal Entry #2</td>
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<td>Basics 8</td>
<td>Orthographic Drawing Skills</td>
<td>TG Ch. 3</td>
<td>DWG 4, DWG 5; Mid-quarter Team Evaluation</td>
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<td>Lab 5</td>
<td>Transport Phenomena Lab A (Fluid Flow and Introduction to Rheology)</td>
<td>Lab 5 Memo (team - electronic); Outline of Oral Presentation</td>
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<td>Basics 10</td>
<td>Drawing an Isometric from a Set of Orthographic Views / Design Your Own Object Part I</td>
<td>DWG 6, DWG 7, DWG 8</td>
<td>DWG 4, DWG 5; INV 4, INV 5; Complete Research Meeting; Mid-quarter Team Evaluation</td>
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<td>Dimensioning Fundamentals</td>
<td>TG Ch. 6.3 - 6.7 &amp; 6.13</td>
<td>DWG 6, DWG 7, DWG 8</td>
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<td>Transport Phenomena Lab B (Energy Flow and Instrumentation)</td>
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<td>Missing Line; Design Your Own Object Part II</td>
<td>DWG 11, DWG 12</td>
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<td>Lab 7</td>
<td>Camera Lab A (Shutter Mechanism)</td>
<td>Lab 7 &amp; 8 combined Report (team - electronic); Lab 8 Pre-Lab (individual--paper)</td>
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<td>Oral Presentation Review / Inventor: Additional Modeling Tools</td>
<td>TG Ch. 13.4 &amp; WE Ch. 9</td>
<td>INV 6*, INV 7</td>
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<td>INV 12, INV 13; Final Course Evaluation (Journal Entry #5); Final Team Evaluation; Purdue Visualization Test (post - online)</td>
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<td>Oral Presentations: Engineering Product</td>
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<td>Final Presentation Slides (team - electronic); Final Handout</td>
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<td>Team Building Wrap-up; Final Exam Review; Inventor Work Time</td>
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<td>SEI*; Complete evaluations in class as time permits</td>
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<td>SEI*; Final Course Evaluation (Journal Entry #5); Final Team Evaluation; INV 12*, INV 13; Purdue Visualization Test (post - online)</td>
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* Assignments given & collected on the same day; DWG=Drawing; INV=Inventor; Electronic copy due midnight of prior day
TG="Technical Graphics", TTD="Tools and Tactics of Design", WE="Writing as an Engineer"
ENGINEERING 183 – WINTER QUARTER 2008
Fundamentals of Engineering – II

Classrooms: HI 224  Laboratories: HI 214 – HI 216  Computer: HI 342

**Course Goals:** The goals of this course are twofold: (1) to build on the skills you gained in 181, and (2) to engage you in a quarter-long design/build project. This course is divided into two segments: (1) Basic Skills and (2) Hands-on Laboratory.

**Basic Skills:** Each week, you will be introduced to important engineering skills and given an opportunity to practice those skills. Homework assignments will be made in each session and will be due on the date indicated on the Daily Assignment List. Assignments received more than one session late will be marked but will not earn credit. One mid-term exam and one final exam will be given. Exams are given closed book, closed notes, closed outside resources unless otherwise stated at the time of the exam. Note: No food or beverages are allowed in the classrooms or labs.

**Hands-On Laboratory (2 hrs):** Each week you will attend one 2-hour Hands-on Laboratory sessions. During the laboratory sessions, student teams will design and build a roller coaster given certain requirements. Weekly milestones will be set and related assignments will be made. You will be graded on whether they meet the deadlines and the quality of work on their assignments. Situations involving late reports or missed labs will be handled at the discretion of the TA and instructor. However, penalties can range from a 20% deduction to no credit. Toward the end of the quarter, a competition will be held to determine the degree to which each team’s roller coaster meets the design criteria. A more detailed description of the design project, deadlines, and grading criteria is provided in your course packet. Please note that all tools and supplies assigned to a team must be returned in good working order and formally accounted for at the end of the quarter. Any lost or damaged items must be replaced at the team’s expense. Failure to return any object will result in grades being withheld for the team until the object is found or replaced.

**Grading:** The contribution of each course segment to the overall course grade is outlined below.

<table>
<thead>
<tr>
<th>Segment</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td><strong>Basic Skills</strong></td>
<td>18%</td>
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<tr>
<td>Daily Assignments / Quizzes</td>
<td>18%</td>
</tr>
<tr>
<td><strong>Labs</strong></td>
<td>35%</td>
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<tr>
<td>Lab Memos</td>
<td>4%</td>
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<tr>
<td>Lab Quizzes</td>
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<tr>
<td>Initial Paper Design</td>
<td>10%</td>
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<tr>
<td>Final System Test</td>
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<tr>
<td>Oral Presentation</td>
<td>5%</td>
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<tr>
<td>Lab Notebook</td>
<td>5%</td>
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<tr>
<td>Final Written Lab Report</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Exams (Basics and Labs)</strong></td>
<td>40%</td>
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<tr>
<td>Midterm</td>
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<tr>
<td>Final</td>
<td>20%</td>
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<tr>
<td><strong>Final Team Evaluations</strong></td>
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<tr>
<td>Journal Entries</td>
<td>1%</td>
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<tr>
<td>Attendance</td>
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<tr>
<td>Creativity in Engineering Design Assessment (Bonus)</td>
<td>2%</td>
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</table>

**Course Materials:** The following materials are required for this course:

- **To Purchase at Tuttle Uniprint:** “ENG 183 – Fundamentals of Engineering Student Course Packet”
- **Books (ALL CAMPUS BOOKSTORES)**
  - **To Purchase:** MATLAB: An Introduction with Applications, 3rd Edition, by Gilat
Reuse from 181:
- Tools and Tactics of Design, by Dominick, et al
- A Guide to Writing as an Engineer, by David Beer & David McMurrey

- Storage Medium – USB flash drives (preferred) or 3.5” High Density disks. **Note:** 3GB storage space on a network drive accessible by FTP (File Transfer Protocol) from outside of class is provided by the First-Year Engineering Program.
- Mechanical pencil, eraser, 6” scale (inches and metric) – sold as a group in a blue pocket protector at the OSU Bookstore
- AutoDesk Inventor® Professional 2008 (provided by the First-Year Engineering Program, reuse from 181)

**CAD Computer Graphics Lab:** In addition to your classrooms and labs, you will have access to the Hitchcock Computer Graphics Lab (HCGL) located in Hitchcock Hall Room 342. For the most up to date schedule, please consult postings outside the room. You are to use only the software supplied in these labs; that is, you may not install any software onto, or copy any software from the lab computers. **Food and drink are not permitted in the lab.** Violation of these policies will result in expulsion from the lab.

**Accreditation Board for Engineering and Technology - Program Criteria 2000:**

**Engineering programs must demonstrate that their graduates have:**

(a) an ability to apply knowledge of mathematics, science, and engineering X
(b) an ability to design and conduct experiments, as well as to analyze and interpret data X
(c) an ability to design a system, component, or process to meet desired needs X
(d) ability to function on multi-disciplinary teams X
(e) an ability to identify, formulate, and solve engineering problems X
(f) an understanding of professional and ethical responsibility X
(g) an ability to communicate effectively X
(h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning X
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice X

*ENG183 ascribes to the criteria as marked with an “X”*
<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Session</th>
<th>Session Topic(s)</th>
<th>Reading</th>
<th>Assigned Work</th>
<th>Assignments Due</th>
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<tr>
<td>1</td>
<td>F</td>
<td>4</td>
<td>Lab 1</td>
<td>Intro to Course; Intro to Lab-on-a-Chip</td>
<td>Lab 1 Procedure</td>
<td>Lab 1 Memo; Read NTM 1; Team Working Agreement; Project Schedule; Project Notebook; Group Creation Survey; Watch Cleaning and Design Print Videos</td>
<td>Group Creation Survey* (due by midnight)</td>
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<td>M</td>
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<td>Basics 1</td>
<td>Good Dimensioning Practices</td>
<td>TG 6.1 - 6.7, TG 6.13</td>
<td>DWG 1; Read Lab-on-a-Chip Project Description Document</td>
<td>(NOTE: CARMEN DO-AT-HOME MODULE)</td>
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<td>Basics 3</td>
<td>Brainstorming and Project Management; Lab-on-a-Chip Design (extended period)</td>
<td>TTD 1.2, 3.1, 4.2</td>
<td>Preliminary Chip Design (paper); Read Nano-technology Project Description Document; Journal Entry #1; pre-DWG 2</td>
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<td>Lab 2</td>
<td>Microfluidics</td>
<td>TG 6.8</td>
<td>CKT 1; DWG 2; pre-DWG 3; Circuit Quizzes 1,2</td>
<td>pre-DWG 2; DWG 1</td>
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<td>Tolerancing</td>
<td>TG 6.11</td>
<td>DWG 3, 4</td>
<td>pre-DWG 3; CKT 1; Circuit Quizzes 1,2</td>
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<td>Basics 5</td>
<td>Inventor: Symmetrical Parts / Rotation</td>
<td>INV 1*, 2</td>
<td>NTM 2 Quiz; DWG 2; INV 1*; In-class Review of Preliminary Chip Design (paper)</td>
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<td>Lab 3</td>
<td>Detection Circuit Building Lab 1/Nano Tours</td>
<td>Lab 3&amp;4 Procedure</td>
<td>Lab 3 &amp; 4 Memo; Read NTM 3 &amp; 4; Final Chip Design (Inventor);</td>
<td>Lab 2 Memo; Preliminary Chip Design (paper); Project Notebook</td>
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<td>Day</td>
<td>Date</td>
<td>Tutorials/Assignments</td>
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<td>Martin Luther King Holiday - No Class</td>
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<td>Lab 4: Detection Circuit Building Lab 1/Nano Tours</td>
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<td>Basics 7: Detail and Working Drawings: TG 9.1 - 9.3</td>
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<td>Basics 8: MATLAB 1: Introduction and Script Files</td>
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<td>Lab 6: Microfabrication/Molding Lab</td>
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<td>Lab 7: Nano-Tools / De-Molding Lab</td>
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<td>Basics 13: MATLAB 5: Introduction to Programming</td>
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<td>Basics 14: MATLAB 6: Relational and Logical Operators</td>
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**Notes:**
- INV 3*, 4
- Lab Tour Summary
- NTM 3 & 4 Quiz; DWG 3, 4; INV 2, 3*
- Final Chip Design (Inventor); Journal Entry #2
- DWG 5 (after completing INV 4); Mid-Quarter Team Evaluation
- Lab Tour Summary
- DWG 5, INV 4
- Mid-Quarter Team Evaluation
- MAT 2; MAT 2 Quiz; Journal Entry #3
- MAT 1; MAT 1 Quiz
- Lab 5 Memo; Journal Entry #3
- Lab 6 Memo; Read NTM 5 & 6; Watch Demolding Video
- Lab 5 Memo; Mid-Quarter Team Evaluation
- MAT 2; MAT 2 Quiz
- NTM 5 & 6 Quiz; MAT 3; MAT 3 Quiz
- Lab 6 Memo; Watch Demolding Video; Outline of Oral Presentation
- MAT 4; MAT 4 Quiz
- MAT 5; MAT 5 Quiz
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<th>Day</th>
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<td>MATLAB 7: Loops</td>
<td>MAT 7 / MAT 7 Quiz</td>
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<td>MAT 8 / MAT 8 Quiz</td>
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<td>Lab 9</td>
<td>Final Testing</td>
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<td>Co-op Presentation / MATLAB 9: Programming (possible extended period)</td>
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<td>Ethics / Final Exam Review</td>
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<td>Project Presentations</td>
<td>[Final Report; Project Notebook; Final Paper Design; Final Presentation Slides] (Hardcopy and CD); Final Course Evaluation (Journal #5); Final Team Evaluation; Ethics Learning Module Content: (Online Case Study, Assigned Ethics Case Quiz, Module Survey)</td>
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</table>

*Assignments given & collected on the same day.

TG="Technical Graphics", TTD="Tools and Tactics of Design", WE="Writing as an Engineer"