

<b>COURSE NUMBER:</b> Vg100		<b>COURSE TITLE:</b> Introduction to Engineering	
<b>CREDIT:</b> 4		<b>PREREQUISITES:</b> None	
<b>TEXTBOOKS/REQUIRED MATERIAL:</b> Varies		<b>PREPARED BY:</b> Gang Zheng <b>DATE OF PREPARATION:</b> Oct. 8, 2013 <b>DATE OF UC APPROVAL:</b> Oct. 30, 2013	
<b>INSTRUCTOR(S):</b> Peisen Huang, Roberto Dugnani, Shane Johnson		<b>SCIENCE/DESIGN:</b> n/a	
<b>CATALOG DESCRIPTION:</b> Introduces students to the professional technical and communication skills required of engineers and provides them with an overview of engineering at the beginning of their program. An important component of the course is the real-world engineering projects.		<b>COURSE TOPICS:</b> - Engineering problem solving - Design - Teams - Global and societal impacts - Ethical decisions - Communication skills	
<b>COURSE STRUCTURE/SCHEDULE:</b> Lecture: two 90 minutes lectures in each week in Fall, plus one additional 45 minutes lectures in Summer. Laboratory: 1 per week, 2.5 hrs			
<b>COURSE OBJECTIVES</b> [Course Outcomes in brackets]		<ol style="list-style-type: none"> <li>To provide an experiential introduction to engineering through project-based work in an engineering discipline, appropriate for first-year students and undertaken by student teams. [1,2,3]</li> <li>To introduce students to the basics of written, oral, and visual communication. [7,8,9]</li> <li>To provide experiences in teambuilding and teamwork. [4]</li> <li>To introduce students to the role of the engineer in society and professional responsibilities/ethics. [5,6]</li> <li>To introduce environmental and quality concerns in the engineering profession, including the concept of “whole life design” for recycling and environmentally conscious engineering decision making. [5,6]</li> <li>To introduce students to the acceptance and analysis of risk in engineering design and manufacturing. [2]</li> </ol>	
<b>COURSE OUTCOMES</b> [Program Outcomes in brackets]		<p>After completing Vg100, students should demonstrate proficiency with:</p> <ol style="list-style-type: none"> <li>Solve engineering problems using project-specific mathematics, engineering, and science concepts. [a, e]</li> <li>Analyze, interpret and make decisions about quantitative data using basic concepts of descriptive statistics (mean, Median, standard deviation, normal distributions, and mode) and measurement, including issues in: [b, k] <ol style="list-style-type: none"> <li>precision and accuracy;</li> <li>sample and population</li> <li>error and uncertainty.</li> </ol> </li> <li>Solve an open-ended design problem by: [c, e, k] <ol style="list-style-type: none"> <li>transforming an open-ended design problem into an answerable one;</li> <li>breaking down a complex design problem into sub-problems;</li> <li>determining assumptions involved in solving the design problem;</li> <li>determining resources that can be used to solve the design problem and how to obtain these resources;</li> <li>determining multiple possible design solutions to the design problem;</li> <li>selecting a design solution using a well-defined method appropriate to the problem domain.</li> </ol> </li> <li>Use the following skills in the context of a team-based design project: [d] <ol style="list-style-type: none"> <li>develop clearly defined, explicitly agreed-on project goals;</li> <li>develop and implement a project plan;</li> <li>conduct effective team meetings;</li> <li>document team activities’</li> <li>evaluate how well the team and individual team members are functioning (using team norms and a knowledge of good team practices).</li> </ol> </li> <li>Engage in an ethical decision-making process, given some engineering situations: [f] <ol style="list-style-type: none"> <li>analyze the situation (using a appropriate method or framework);</li> <li>decide on a course of action (using relevant codes of ethics);</li> <li>support this decision.</li> </ol> </li> <li>Identify the ethical, environmental and other global and societal impacts of engineering practice. [f, h]</li> <li>Designing technical/professional communications by employing the following skills: [g] <ol style="list-style-type: none"> <li>analyzing a communication situation so as to determine the audiences and their information needs and a purpose and rhetorical approach for the document of communication;</li> <li>breaking a communication task into components and employ appropriate strategies at each state of the communication process (both individually and collaboratively);</li> <li>writing readable prose, as characterized by well-organized paragraphs, well-constructed sentences, precise and effective use of both non-technical and technical vocabulary, and adequate and appropriate use of transitional devices;</li> <li>organizing information for oral presentation;</li> <li>creating clear, accurate graphics that are well integrated into oral and written communications, including both quantitative graphics (charts/graphs) and representational graphics (diagrams/illustration).</li> </ol> </li> <li>Deliver well-structured, technically sound communication of the following types: [g] <ol style="list-style-type: none"> <li>well-formatted informal and formal written reports’</li> <li>oral reports, given without notes and with supporting visuals.</li> </ol> </li> <li>Evaluate and effectively construct arguments, using technical content at the first-year level. [g]</li> </ol>	
<b>ASSESSMENT TOOLS</b> [Course Outcomes in brackets]		Homework [1-9] Midterm Exam [1-8] Final Exam [1-9] Lab experiment [1-9]	