

<b>Course alpha, number, title</b>	<b>CSE 131</b> —Introduction to Technical Computing
<b>Course (catalog) description</b>	Use of computing systems for technical communications and problem solving in engineering, mathematics, and science. Development and use of mathematical models suitable for computer representation, solution, graphical display, and animation.
<b>Prerequisite(s)</b>	(MTH 124 or concurrently) or (MTH 132 or concurrently) or (LBS 118 or concurrently)
<b>Class/Lab schedule:</b>	3(2-2)—One 110-minute lecture/week, no recitations/week, one two-hour laboratory/week
<b>Textbook(s) and/or other required material</b>	It is an electronic, custom book of sections selected from five books of the McGraw-Hill Higher Education BEST series: <i>Introduction to MatLab 6 for Engineers</i> , William Palm III, <i>Spreadsheet Tools for Engineers</i> , B. Gottfriedm, <i>Project Management and Teamwork</i> , K. Smith <i>Introduction to Engineering Ethics</i> , R. Schinzinger and M. Martin <i>Introduction to Engineering Design and Problem Solving</i> , M. David Burghardt,
<b>Topics covered</b>	<ul style="list-style-type: none"> <li>What is an engineer/what is engineering</li> <li>What is technical problem solving</li> <li>What is a computational model/types of computational models</li> <li>Why representation is key</li> <li>Introduction to technical group work</li> <li>Introduction to engineering ethics <ul style="list-style-type: none"> <li>Engineering as "social experiment"</li> <li>commitment to safety</li> <li>workplace rights and responsibilities</li> </ul> </li> <li>Introduction to MatLab <ul style="list-style-type: none"> <li>MatLab as a calculator</li> <li>MatLab script and function files</li> <li>Simple plots in MatLab</li> <li>Array, Vector, and Matrix operations in MatLab</li> <li>P-vectors: unit vectors, dot product, cross product, Problems from Statics</li> </ul> </li> <li>Exchanging data between MatLab and EXCEL</li> <li>Programming <ul style="list-style-type: none"> <li>The concept and importance of "data type" (including strings and cell arrays)</li> <li>Programming in EXCEL and MatLab</li> <li>EXCEL macros</li> <li>MatLab: IF, FOR, WHILE, recursion</li> </ul> </li> <li>Technical problem-solving techniques <ul style="list-style-type: none"> <li>Simulation models in EXCEL and MatLab (Simulink)</li> <li>Solving optimization problems with EXCEL and MatLab</li> <li>Curve fitting using EXCEL and MatLab</li> <li>Graphical Problem Solving, MatLab and EXCEL</li> </ul> </li> </ul>

<b>Course learning objectives</b>	<p>CSE 131 is a first course in (a) technical problem solving and (b) using computer applications as tools for technical problem solving. CSE 131 is NOT a computer literacy course.</p> <ul style="list-style-type: none"> <li>• to develop facility in structuring and solving problems drawn from technical areas,</li> <li>• to learn selected features of EXCEL and MatLab and to demonstrate ability to apply these tools in problem settings,</li> <li>• to gain experience and confidence in learning new features of EXCEL and MatLab,</li> <li>• to learn and apply principles of technical group work by productive participation in class group-work teams, and</li> <li>• to learn introductory principles of engineering ethics, and demonstrate ability to apply these principles in real world</li> </ul>
<b>Relationship of course to ME program outcomes</b>	<p>The following measurement standard is used to evaluate the relationship between the course outcomes and the educational-program outcomes:            3 = Strong Emphasis, 2 = Some Emphasis, 1 = Little or No Emphasis.</p> <ul style="list-style-type: none"> <li>(a) an ability to apply knowledge of mathematics, science, and engineering—2</li> <li>(b) an ability to design and conduct experiments, as well as to analyze and interpret data—1</li> <li>(c) an ability to design a system, component, or process to meet desired needs—2</li> <li>(d) an ability to function on multi-disciplinary teams—3</li> <li>(e) an ability to identify, formulate, and solve engineering problems—3</li> <li>(f) an understanding of professional and ethical responsibility—2</li> <li>(g) an ability to communicate effectively—1</li> <li>(h) the broad education necessary to understand the impact of engineering solutions in a global/societal context—1</li> <li>(i) a recognition of the need for and the ability to engage in life-long learning—1</li> <li>(j) a knowledge of contemporary issues—1</li> <li>(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice—3</li> <li>(l) design, build, and test in mechanical systems area—1</li> <li>(m) design, build, and test in thermal/fluids area—1</li> <li>(n) application of advanced mathematics—1</li> <li>(o) capstone design experience—1</li> </ul>
<b>Contribution to professional component:</b>	0% Engineering Science 0% Engineering Design 100% Other
<b>Person(s) who prepared this description</b>	R. Enbody and J. Sticklen
<b>Date of Preparation</b>	April 17, 2004