

CSET 3600 Software Engineering and human Interfacing
(3 semester credit hours)

CSET Required
IT Elective

Current Catalog Description:

An introduction to software engineering processes for technology students. Includes: user requirements, software specification, design approaches, software tools, validation, modification, maintenance, documentation, lifecycle models, and intellectual property considerations.

Textbooks:

“Software Engineering: A Practitioner’s Approach,” 7th Edition, Roger S. Pressman, McGraw Hill, 2005.

References:

Course web site
Various web references assigned by instructor

Related Program Outcomes:

CSET Program (c, d, & f) – See attached table
IT Program (c, d, f & j) – See attached table

Course Objectives:

After successful completion of this course, students will:

- be able to explain and apply a broad range of concepts from software engineering, spanning all aspects the software engineering process
- be able to recognize, define, and make correct use of generally accepted software engineering techniques and terminology
- have experienced working as a member of a team on a software engineering project
- have experienced applying a representative cross section of software engineering techniques
- be familiar with best practices of software engineering

Major Topics Covered in the Course

Topic	Lecture Hours
Software design	8
Using APIs	5
Software tools and environments	3
Software processes	3
Software requirements and specifications	4
Software validation	3
Software evolution	3
Software project management	3
Risks and liabilities of computer-based systems	1
Intellectual property	1
Object Oriented Programming	8
Totals	42

Laboratory Projects:

Students will be required to complete a major programming project that requires the coordinated efforts of a team to be successful. Given a loose program specification use software analysis and design techniques to develop a software application. Implement this design using an appropriate programming language. (6 weeks)

Oral and Written Communications

Every student is required to submit at least 2 written reports (not including exams, tests, quizzes, or commented programs) of an appropriate length and to make oral presentations (typically 10 minutes duration) as part of design team progress reports.

Social and Ethical Issues

Risks and liabilities of computer-based systems (1 hour)
Intellectual property (1 hour)

Theoretical Content

Software engineering paradigms
Formal Methods for Software Specification
Software Planning and Cost Estimation
Software Project Management
Software Analysis and Design Methodologies
Software Life Cycle
Software Verification and Testing Methodologies

Problem Analysis

1. Given a loose program specification use appropriate analysis and design techniques to write the requirements for a software application. (3 weeks).

Solution Design

This course requires students to design, implement and test a software application based on a relatively loose specification of need. As part of the project, students will create user task models and make appropriate use of software.

Course Coordinator

William Acosta (William.acosta@utoledo.edu)

Computer Science & Engineering Technology Program

	ABET Course Outcomes:	Course Outcomes	Assessment Methods
a	an ability to select and apply knowledge of computing and mathematics appropriate to the discipline. Specifically, an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates the comprehension of the tradeoffs involved in the design choices		
b	an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.		
c	an ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs. Specifically, and ability to apply design and development principles in the construction of software systems of various complexity	have experienced applying a representative cross section of software engineering techniques	Evidenced by successful completion of the software design project
d	an ability to function effectively as a member or leader on technical teams to accomplish a common goal.	have experienced working as a member of a team on a software engineering project	As evidenced by collaborating with other students on the software design project
e	an understanding of professional, ethical, legal, security and social issues and responsibilities including a respect for diversity.		
f	an ability to communicate effectively with a range of audiences using a range of modalities including written, oral and graphical.	Be able to communicate ideas, design concepts, development tasks, and progress using both oral and written communication	Evidenced by technical reports and oral presentation of course project milestones and homework projects
g	an ability to analyze the local and global impact of computing on individuals, organizations, and society.		
h	recognition and understanding of the need for and an ability to engage in self-directed continuing professional development.		
i	an ability to select and apply current techniques, skills, and tools necessary for computing practice		
j	an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments, and to apply experimental results to improve processes		
k	a commitment to quality, timeliness, and continuous improvement		

Information Technology Program

	ABET Course Outcomes:	Course Outcomes	Assessment Methods
a	an ability to select and apply knowledge of computing and mathematics appropriate to the discipline. Specifically, an ability to use and apply current technical concepts and practices in the core information technologies. [IT-j]		
b	an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.		
c	an ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs. And, an ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems. [IT-k]	have experienced applying a representative cross section of software engineering techniques	Evidenced by successful completion of the software design project
d	an ability to function effectively as a member or leader on technical teams to accomplish a common goal.	have experienced working as a member of a team on a software engineering project	As evidenced by collaborating with other students on the software design project
e	an understanding of professional, ethical, legal, security and social issues and responsibilities including a respect for diversity.		
f	an ability to communicate effectively with a range of audiences using a range of modalities including written, oral and graphical.	Be able to communicate ideas, design concepts, development tasks, and progress using both oral and written communication	Evidenced by technical reports and oral presentation of course project milestones and homework projects
g	an ability to analyze the local and global impact of computing on individuals, organizations, and society.		
h	recognition and understanding of the need for and an ability to engage in self-directed continuing professional development.		
i	an ability to select and apply current techniques, skills, and tools necessary for computing practice. And an ability to effectively integrate IT-based solutions into the user environment. [IT-l]		
j	an understanding of best practices and their application. [IT-m]	Be able to apply key practices in software engineering: software testing, version control, and refactoring code	Evidenced by homework assignments, course project and exam questions
k	an ability to assist in the creation of an effective project plan. [IT-n]		