

# CEN: Computer Software Engineering Courses

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## Courses

### **CEN 3031 Software Engineering I**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: [COP 3022](#) OR [COP 4331](#)

Preparation of software planning, specifications, design, coding, testing and maintenance. Familiarization with the team approach to large software system development with an emphasis on software process and methodology.

### **CEN 3032 Software Engineering II**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: ([COP 4331](#) OR [COP 3022](#)) AND ([CEN 3031](#))

Focus on software design, implementation, and testing. Students will work in teams to develop software systems using the design principles discussed in class.

### **CEN 4053 Software Engineering Management**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: [CEN 3032](#)

Reviews concepts and principles related to the management of software engineering projects. Focus is on both heavyweight and lightweight processes.

### **CEN 4078 Secure Software Development**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: [CEN 3031](#) AND [COP 3022](#) AND [COP 3530](#)

Examines the importance of building security into the design, implementation and testing phases of software development. Covers coding techniques that avoid known vulnerabilities and test strategies that can uncover previously unknown weaknesses. Includes discussion of security policies and design principles.

### **CEN 4340C IT Infrastructure Planning, Acquisition, and Integration**

College of Sci and Engineering, Department of Department of Information Tech

3 sh (may not be repeated for credit)

Prerequisite: [COP 2334](#) OR [COP 2253](#) OR [COP 2830](#)

A systematic examination of the hardware and software analysis and design or information technology systems. Acquisition of assets for integration into a new or existing infrastructure. Explores what makes IT projects different from other types of systems and how the principles and methods of system development can be integrated to define the IT system. Topics include hardware and software system implementation, information assurance, hardware and software catastrophe recovery, hardware and software configuration management, software license knowledge and monitoring, system hardware and software infrastructure support, infrastructure environmental concerns, and data and system integration.

### **CEN 4721 Human-Computer Interaction**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: [COP 3022\\*](#) OR [COP 4331\\*](#)

Introduces students to the design of the interaction between people and computers. It will give students insight and experience in key issues of HCI design, and will sample different areas related to human-computer interaction. Students will discuss issues and tradeoffs in interaction design, propose effective designs, conduct user studies, and evaluate alternative solutions to design problems.

### **CEN 4905 Directed Study**

College of Sci and Engineering, Department of Computer Science

1-12 sh (may be repeated indefinitely for credit)

### **CEN 5079 Secure Software Development**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Examines the importance of building security into the design, implementation and testing phases of software development. Covers coding techniques that avoid known vulnerabilities and test strategies that can uncover previously unknown weaknesses. Includes discussion of security policies and design principles. Prior to taking this course students should have knowledge and skill in software development.

### **CEN 5905 Directed Study**

College of Sci and Engineering, Department of Computer Science

1-12 sh (may be repeated indefinitely for credit)

### **CEN 6016 Software Engineering Process**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: [COP 5007\\*](#)

CEN6016 is a professional practice course in which the students will create several software engineering design documents. Students will also critique and debate current topics and trends in software engineering. Finally, prominent software engineering approaches, methods, and processes (e.g., CMMI, Agile processes) are examined and compared.

**CEN 6017 Continuous Software Engineering**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: [CEN 6030](#)\*

This course focuses on aspects of modern software engineering as they pertain to continuous workflows. Topics of continuous testing, integration, delivery, and deployment will be discussed throughout the course. Significant programming experience is required for this course.

**CEN 6030 Agile Software Engineering**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: [COP 6416](#)

Analysis and overview of concepts in agile software development. Covers agile principles, methodologies, practices, and artifacts. This course may require completion of graduate foundations courses in computer programming or the equivalent undergraduate coursework if a student has insufficient academic or professional experience in computer science.

**CEN 6064 Software Design**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: [CEN 6016](#) OR [CEN 6030](#)

The course examines the design principles/methodologies appropriate for developing complex software systems. Goals include a comparative analysis of existing design methods, object-oriented design paradigms, and the extensions of modern design techniques and principles to the design of software with distributed implementations in mind.

**CEN 6074 Software Assurance and Security**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: [CEN 6016](#)

Concepts and principles related to developing and maintaining secure software systems with no exploitable vulnerabilities with high levels of integrity and reliability.

**CEN 6095 Software Engineering Practice and Tools**

College of Sci and Engineering, Department of Computer Science

3 sh (may not be repeated for credit)

Prerequisite: [CEN 6016](#) AND [COP 5007](#)

Practicum course simulating best practices used in the software industry for maintaining software systems. Emphasis on the use of modern software methods and tools. Permission is required.

**CEN 6905 Directed Study**

College of Sci and Engineering, Department of Computer Science

1-12 sh (may be repeated indefinitely for credit)

\* This course may be taken prior to or during the same term.