SOFTWARE ENGINEERING (SE)

SE-104 Introduction to Software Engineering Credits: 3
Term Offered: Spring Term
Course Type(s): None
Introduction to the methods and tools for software development. Topics include the personal software process, requirements engineering, software design, testing methods, project management, and other management techniques.

SE-199 Independent Study in Software Engineering Credits: 3
Term Offered: Summer Term
Course Type(s): None
Independent Study of a particular subject or problem in software engineering under the guidance of a software engineering faculty member.

SE-205 Requirements Engineering and Specifications Credits: 3
Prerequisites: SE-104 and CS-175.
Term Offered: Fall Term
Course Type(s): None
Elicitation, analysis, specification, validation, and management of user requirements; conflict resolution; process, notations, methods and tools, requirements standards, operational concepts documents (OCD) and system requirements specifications (SRS).

SE-207 Software Design and Architecture Credits: 3
Prerequisites: SE-104 and CS-176 or CS-275; and EN-101 and EN-102 or permission of the instructor.
Term Offered: Spring Term
Course Type(s): WT
Design process notations, methods, paradigms, and tools. System architecture tradeoff analysis; component and subcomponent specification. Generic (domain) design; architectural styles, frameworks, and patterns. Test and integration plan documents. Architecture standards; design tools.

SE-299 Independent Study in Software Engineering Credits: 3
Term Offered: All Terms
Course Type(s): None
Independent Study of a particular subject or problem in software engineering under the guidance of a software engineering faculty member.

SE-306 Formal Methods in Software Engineering Credits: 3
Prerequisite: MA-120 or MA-130.
Term Offered: Fall Term
Course Type(s): None
Covers a variety of formal methods and applies them to software specification development. Assumes a firm grounding in mathematical logic, knowledge of proof techniques, and skill in the translation of problems expressed in English into predicate logic.

SE-312 Software Verification, Validation, and Maintenance Credits: 3
Prerequisites: SE-104 and CS-176 or CS-275.
Term Offered: Fall Term
Course Type(s): None
Covers inspections of requirements, design and code, as well as testing, the handling of change requests, software evolution, code comprehension, and change management.

SE-337 Enterprise Mobile Apps Design and Development Credits: 3
Prerequisite: CS-205 passed with a grade of C or higher.
Term Offered: Fall Term
Course Type(s): None
Presents methodologies to build enterprise mobile apps on iPad tablets and iPhone smartphones using iOS. The course will cover technologies to use in the design and development of apps on mobile devices and integration of these apps with corporate data sources, sensor devices and cloud computing services. Also listed as CS-337.

SE-351 Microprocessor Laboratory Credits: 3
Prerequisite: MA-120 or MA-130.
Term Offered: Fall Term
Course Type(s): None
Introduces the student to microprocessor-based, hardware-interface design. Provides practice in developing software that drives the interfaces between a microprocessor and the outside world. Topics include: logic circuit analysis and synthesis, digital hardware components, microprocessor system architecture, and assembly and C/C++ language programming of input/output device drivers.

SE-352 Embedded and Real-Time Software Credits: 3
Prerequisite: SE-351.
Term Offered: Spring Term
Course Type(s): None
Familiarizes students with the fundamental issues related to embedded and real-time software systems and gives them an opportunity to become familiar with a commercially available system for developing and testing embedded and real-time software. Topics include: definition of embedded systems, process concurrency, interprocess communications, synchronization, and process scheduling.

SE-353 Comparative Languages Credits: 3
Prerequisite: CS-176 or CS-275.
Term Offered: Fall Term
Course Type(s): None
Beginning with a history of the development of programming languages that provides the background necessary to understand programming-language design and evaluation. This is followed by an introduction to the basic programming language constructs and then critically comparing their implementation in some of the most common languages. Included is a discussion of the advantages and disadvantages of modern programming languages for a variety of applications. Some of the languages discussed are LISP, C, Small Talk, C++, Java, Ada, PL/1, and Prolog.

SE-356 Internet Technologies for Software Engineers Credits: 3
Prerequisites: CS-102 and CS-176 or CS-275.
Term Offered: Spring Term
Course Type(s): None
Provides an intensive look at the leading-edge technologies that are used to build Internet applications, what they do, and how they do it. Topics covered will include: hyper-text markup language, cascading style sheets, scripting languages, active server pages, Perl/CGI, and the extensible markup language.

SE-357 Engineering Web-based Systems Credits: 3
Prerequisites: SE-205 and SE-207.
Term Offered: Spring Term
Course Type(s): None
A practical introduction to the principles, methods, and tools required to create high-quality software applications for the distributed, client-server context of the Web. Emphasis is on architectural designs, and language and data access methods that are common in Web-based systems.
SE-360  Introduction to Game Development  Credits: 3
Prerequisite: CS-205 passed with a grade of C or higher.
Term Offered: Fall Term
Course Type(s): None
An introduction to the creation of computer/video games and the
different elements of games, including computer graphics, animation,
artificial intelligence, algorithms, data structures, networking, software
development cycles and human-computer interaction. Also listed as
CS-360.

SE-370  Program Development Under Unix  Credits: 3
Prerequisite: CS-176 or CS-275 passed with a grade of C or higher.
Term Offered: Fall Term
Course Type(s): None
Introduction to the use of the UNIX operating system and its utilities
for incremental and distributed program development, maintenance,
and debugging. The course covers the UNIX shell, utilities, and program
development tools that are used for large projects involving multiple
developers on multiple machines. Three hours per week. Also listed as
CS-370.

SE-398  Special Topics in Software Engineering  Credits: 3
Prerequisite: As announced in the course schedule.
Term Offered: All Terms
Course Type(s): None
A 300-level intensive study of a particular subject or problem in software
engineering to be announced prior to registration. May be conducted on
either a lecture-discussion or a seminar basis. Three or four hours per
week.

SE-399  Independent Study in Software Engineering  Credits: 1-3
Term Offered: All Terms
Course Type(s): None
Independent Study of a particular subject or problem in software
engineering under the guidance of a software engineering faculty
member.

SE-402  Human Computer Interaction  Credits: 3
Prerequisite: Completion of forty-eight credits of coursework.
Term Offered: All Terms
Course Type(s): IM
Covers basic human psychology, computer technology, and the interface
between them. The key topics of HCI are examined, grounded in the
context of usability and the design lifecycle.

SE-403  Software Process Improvement  Credits: 3
Prerequisite: CS-205.
Term Offered: Spring Term
Course Type(s): None
Students will be introduced to the various aspects related to
software processes. It will focus on the definition and modeling of
a software process, as well as on methods for process assessment
and improvement. The concepts will be illustrated through process-
 improvement case studies, followed by hands-on experience with the
improvement of the personal software-development process.

SE-418  Software Project Management  Credits: 3
Prerequisites: CS-176 or CS-275, and EN-101 and EN-102 or permission of
the instructor.
Term Offered: Spring Term
Course Type(s): WT
Project management and its application to software-development
projects. Emphasis will be on planning, organizing, monitoring, and
controlling. Students will learn how to develop work breakdown
structures, estimate task durations, assign resources, specify network
precedence, and determine a project’s critical path. Methods for
scheduling in the face of resource constraints will be included, as well as
function point counting, algorithmic models for estimating total project
cost, and software tools for project planning and monitoring.

SE-485A  Software Practicum  Credits: 3
Prerequisites: CS-205, SE-205, SE-207, and SE-312.
Term Offered: Fall Term
Course Type(s): EX5, RD
Team work on substantial software projects submitted by corporate
sponsors. Interim progress reports required, with a final formal defense
and presentation to corporate staff, faculty, and other students in the
course. At the end of SE-485A, students must submit their software
engineering portfolio for review by the Software Engineering faculty.

SE-485B  Software Practicum  Credits: 3
Prerequisite: SE-485A.
Term Offered: Spring Term
Course Type(s): EX5, RD
Team work on substantial software projects submitted by corporate
sponsors. Interim progress reports required, with a final formal defense
and presentation to corporate staff, faculty, and other students in the
course. At the end of SE-485B, students must submit their software
engineering portfolio for review by the Software Engineering faculty.

SE-498  Special Topics in Software Engineering  Credits: 3
Prerequisite: As announced in the course schedule.
Term Offered: Fall Term
Course Type(s): None
A 400-level intensive study of a particular subject or problem in software
engineering to be announced prior to registration. May be conducted on
either a lecture-discussion or a seminar basis. Three or four hours per
week.

SE-499  Independent Study in Software Engineering  Credits: 1-3
Prerequisite: SE-485A.
Term Offered: Spring Term
Course Type(s): None
Independent Study of a particular subject or problem in software
engineering under the guidance of a software engineering faculty
member.