

Courses in Software Engineering Option

CIS 264 Software Quality Assurance and Testing

Prerequisites: MTH 181

Quality: how to assure it and verify it, and the need for a culture of quality. Avoidance of errors and other quality problems. Inspections and reviews. Testing, verification and validation techniques. Process assurance vs. Product assurance. Quality process standards. Product and process assurance. Problem analysis and reporting. Statistical approaches to quality control.

CIS 290 Software Architectures and Frameworks

Prerequisites: CIS 181

Top-down, team-based experience with rapid development of large software systems using integrated development environments with extensive use of COTS (Components of the Shelf) and minimal development of custom code. Course includes study of software architectures, frameworks, and types of middleware. Introduction to software evolution and configuration management is given.

CIS 365 Software Process and Project Management

Prerequisite: none

Software development processes and the management of software projects. Software lifecycle processes and process models are studied, including universal software development models, models of software evolution, process management, and process assessment and improvement. Also studied are the management of teams and people, software size and cost estimation, project scheduling, and risk management. The use of industry standards is emphasized throughout

CIS 390 Design of Large Software Systems

Prerequisites: CIS 280, CIS 290

Team-based experience with development of large distributed software systems using integrated development environments with use of COTS (Components of the Shelf), substantial development of custom code and integration with legacy systems. Course includes extensive, in-depth study of design patterns, and issues encountered in design of distributed systems. Introduction to software measurement and software metrics is given. Comprehensive coverage of evolution and configuration management is included.

CIS 461 Formal Methods for Software Engineering

Prerequisites: MTH 182, CIS 390

Course in presentation of formal model-based methods of software development. Review of mathematical foundations for formal methods. Formal languages and techniques for specification and design, including specifying syntax using grammars, finite state machines, and Petri nets. Analysis and verification of specifications and designs. Use of assertions, invariants, and proofs. Automated program and design transformation.