

## Course Description

Course Name	Course Number	Prerequisite	Credit Hours
Software Quality Engineering	121003740	-	3

Software quality fundamentals, software quality management processes, practical consideration related to software quality requirements, management techniques and software quality measurements. Software life cycle processes. **Software Quality Fundamentals** such as software engineering culture and ethics, the value and costs of quality, models and quality characteristics, and quality improvement. **Software Quality Management Processes** such as software quality assurance, verification and validation, and reviews and audits. **Practical Considerations** related to software quality. Requirements, defect characterization, software quality management techniques, and software quality measurement.

Course Name	Course Number	Prerequisite	Credit Hours
Software Testing	121003710	-	3

Testing of software throughout its life cycle. Unit and system level testing. Designing of test cases, oracles, and test harness. Black box and white box testing techniques. Measuring test effectiveness. Regressing testing and Integration testing.

Course Name	Course Number	Prerequisite	Credit Hours
Software Design and Architecture	121003732	-	3

Architectural design of complex software systems. commonly-used software system structures, techniques for designing and implementing structures, models and formal notations for characterizing and reasoning about architectures, tools for generating specific instances of an architecture, and case studies of actual system architectures. Architectural design methods for Large-scale software systems, quality design attributes, component-level design, design patterns, aspect-oriented software development, and service oriented architecture.

Course Name	Course Number	Prerequisite	Credit Hours
Software Maintenance and Evolution	121003714	-	3

The principles of generating maintainable software, Theory and practice of maintaining large scale software, problems in maintaining software systems, building software in view of the maintenance problems, reverse engineering, the principles of software evolution, mainly the evolution of open source projects, program comprehension, software Evolution Process Models.

Course Name	Course Number	Prerequisite	Credit Hours
Requirements Engineering	121003763	-	3

Requirements methods, tools, and techniques. Software Requirements Fundamentals. product vs. process, functional vs. non-functional, emergent properties. Requirements Process, process models, process actors, process support and management, and process quality and improvement. Requirements Elicitation. Requirements Analysis, detect and resolve conflicts between requirements, discover the bounds of the software. Requirements Specification. Requirements Validation.

Course Name	Course Number	Prerequisite	Credit Hours
Advanced Software Process	121003752	-	3

Defining and improving the software development process, the concepts of software maturity framework, principles of process improvement and software process assessment. Other topics such as the framework of CMMI and SCAMPI will be introduced.

Course Name	Course Number	Prerequisite	Credit Hours
Mobile Applications Development	121003721	-	3

Developing applications for modern smartphone operating systems. Rapid application development techniques, setup of the development environment, real-world testing, and deployment to both the iTunes App Store and Android Marketplace, developing user-friendly

and interactive applications that operate across multiple platforms, including mobile devices and stand-alone applications, tools for designing mobile applications, Mobile platforms, mobile browsers, native applications, and best practices in terms of test usability.

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<b>Course Name</b>	<b>Course Number</b>	<b>Prerequisite</b>	<b>Credit Hours</b>
<b>Selected Topics in Software Engineering</b>	<b>121003795</b>		<b>3</b>

This course allows the department to cover one of the recent research topics in the field of software engineering.

<b>Course Name</b>	<b>Course Number</b>	<b>Prerequisite</b>	<b>Credit Hours</b>
<b>Distributed Software Development</b>	<b>121003724</b>	-	<b>3</b>

Principles of developing distributed systems. Approaches that use distributed object and component middleware, and service-oriented architectures, characterization of distributed systems, distributed objects and remote method invocation, Design patterns for distributed applications, component-based development, service-oriented architectures, OSGi, and Adaptive middleware.

<b>Course Name</b>	<b>Course Number</b>	<b>Prerequisite</b>	<b>Credit Hours</b>
<b>Software Project Management</b>	<b>121003736</b>	-	<b>3</b>

Skills necessary to lead a project team, understand the relationship of software development to overall product engineering, estimate time and costs, and understand the software process. advanced topics related to life cycle models, requirements elicitation, configuration, to control environments, quality assurance, and leadership, advanced issues of risk analysis, schedule, costs, team organization, resources, and technical approach, Capability Maturity Model and the technology and practices associated with each and a variety of software standards, legal issues involved in liability, warranty, patentability, and copyright.

Course Name	Course Number	Prerequisite	Credit Hours
<b>Software Engineering Tools and Methods</b>	<b>121003751</b>	-	<b>3</b>

Tools and techniques for software integration, heuristic methods for informal approaches and prototyping methods for software developments approaches, software engineering tools (such as miscellaneous tools issues) and software engineering methods, formal methods dealing with mathematically based approaches for software development.

Course Name	Course Number	Prerequisite	Credit Hours
<b>Advanced Software Engineering</b>	<b>121003723</b>	-	<b>3</b>

This course introduces the advanced concepts and techniques of software engineering. It will review the fundamentals of software engineering and the process of object-oriented software development. Also, It covers advanced topics related to Rational Unified Process, Extreme Programming, Software Reuse, and Aspect-Oriented Programming.

Course Name	Course Number	Prerequisite	Credit Hours
<b>Data Mining</b>	<b>121002751</b>	-	<b>3</b>

The analysis of large volumes of data, association analysis, classification, clustering, numeric prediction, pattern discovery in sequential data, Bayesian networks, support vector machines, decision trees, boosting algorithms and other machine learning techniques.

Course Name	Course Number	Prerequisite	Credit Hours
<b>Information Security</b>	<b>121002771</b>	-	<b>3</b>

Modern cryptography, cryptographic problems and their solutions, message authentication techniques, hashing, Digital Signatures and Authentication Protocols, web security and other modern security techniques and tools.