

**Jordan University of Science & Technology**

**Faculty of**

**Computer & Information Technology**

**Curriculum for the Bachelor Degree**

**IN**

**SOFTWARE ENGINEERING**

**2015-2016**



## Study Plan for the Software Engineering Program 2015-2016

The Bachelor Degree in Software Engineering is awarded at Jordan University of Science & Technology after the successful completion of 132 credit hours distributed as follows:-

Requirements	Mandatory	Elective	Total
University Requirements	16	9	25
Faculty Requirements	27	-	27
Departmental Requirements	68	12	80
<b>Total</b>	<b>111</b>	<b>21</b>	<b>132</b>

and after fulfilling the terms and conditions for awarding the bachelor's degree at Jordan University of Science & Technology number (1) issued in 1987 (amended).

### 1. University Requirements (25 CHs):

#### 1-a) University Mandatory Courses (16 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours	
			Lecture	Lab
ARB 101	Arabic Language	3	3	0
CIS 100 <sup>(1)</sup>	Computer Skills	3	3	0
ENG 111 <sup>(2)</sup>	English Language I	3	3	0
ENG 112 <sup>(3)</sup>	English Language II	3	3	0
HSS 100 <sup>(4)</sup>	Culture and University Behavior	1	1	0
MS 100 <sup>(5)</sup>	Military Science	3	3	0

#### 1-b) University Elective Courses (9 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
NUR 100	Health Promotion ( <i>For Non Nursing &amp; Midwifery Students</i> )	3	3	0	-
NF 177	Food Preservation ( <i>For Non Nutrition &amp; Food Technology Students</i> ) (in English)	3	3	0	-
ADS 100	Oral & Dental Health ( <i>For Non Dentistry &amp; Allied Dental Sciences Students</i> )	3	3	0	-
PHAR 104	Drugs and Medicinal Plants: Uses and Side Effect ( <i>For Non-Medicine and Pharmacy Students</i> )	3	3	0	-
PH 104	Human Health and Nutrition ( <i>For Non-Medicine and Nursing Students</i> )	3	3	0	-
PH 200	First Aid and Emergency Procedures ( <i>For Non-Medicine, Pharmacy and Nursing Students</i> )	3	3	0	-
VM 211	Animal Health ( <i>For Non-Veterinary Medicine and Agriculture Students</i> )	3	3	0	-
VM 212	Pet Animals Care ( <i>For Non-Veterinary Medicine Students</i> )	3	3	0	-
HSS 112	Hadith Shareef	3	3	0	-
HSS 113	Aqideh	3	3	0	-
HSS 114	Fiqh	3	3	0	-
HSS 115	Islam & Contemporary Problems	3	3	0	-
HSS 116	Islamic Economic System	3	3	0	-
HSS 121	Principles of Sociology ( <i>For Non-English Language Students</i> )	3	3	0	-

<sup>1</sup>- The student who passes the computer skills exam with 50% or more, or has ICDL certificate or Cambridge certificate will be exempted from taking this course.

<sup>2</sup>- Prerequisite: Pass (ENG 099) or pass the prelim English exam with no less than 50%.

<sup>3</sup>- Prerequisite: (ENG 111) or pass the prelim English exam with no less than 80%.

<sup>4</sup>- The grade for this course is a Pass/Fail grade.

<sup>5</sup>- The grade for this course is a Pass/Fail grade. Non-Jordanian students can take a substitute course from the elective courses, and the grade for the elective course goes into the calculation of the grade point average.

HSS 126	Principles of Psychology (For Non Nursing & Midwifery Students)	3	3	0	-
HSS 127	Education Technology	3	3	0	-
HSS 128	National Education	3	3	0	-
HSS 131	Islamic Civilization	3	3	0	-
HSS 132	The History of the City of Jerusalem	3	3	0	-
HSS 133	Civilization and Recent Cultures	3	3	0	-
HSS 141	Principles of Economics (For Non-Computer and Information Systems Students)	3	3	0	-
HSS 142	Library and Information Research	3	3	0	-
HSS 151	Principles of Management (For Non-Computer and Information Systems Students)	3	3	0	-
HSS 161	Contemporary Problems	3	3	0	-
HSS 166	Man and Science	3	3	0	-
HSS 182	Woman Studies	3	3	0	-
HSS 211	Introduction to Sociology (in English)	3	3	0	-
HSS 212	Arab Society (in English)	3	3	0	-
HSS 213	The Individual and Society (in English)	3	3	0	-
HSS 216	Contemporary International Issues (in English)	3	3	0	-
HSS 221	Introduction to Psychology (For Non Nursing & Midwifery Students) (in English)	3	3	0	-
HSS 222	Creativity and Problem Solving	3	3	0	-
HSS 224	Leadership and Communication Skills	3	3	0	-
HSS 231	History of Sciences in the Arab World	3	3	0	-
HSS 241	Economy in the Third World	3	3	0	-
HSS 242	Information and Research (in English)	3	3	0	-
HSS 250	The History of Music (in English)	3	3	0	-
HSS 429	The Science of Children Behavior and Treatment	3	3	0	-
AP 200	Farm Animal Products and Production (For Non Agriculture And Veterinary Students)	3	3	0	-
PT 100	Wellness & Lifestyle (For Non Physical & Occupational Therapy Students)	3	3	0	-
ES 103	Environment Protection (For Non Environmental Sciences Students)	3	3	0	-
ME 211	Fundamentals of Automobile Engineering (For Non-Mechanical Engineering Students)	3	3	0	-
NR 200	Natural Resources and Man (For Non Agriculture Students)			0	
PP 200	Home Gardens (For Non Agriculture Students)	3	3	0	-
PP 201	Bee Keeping (For Non Agriculture Students)	3	3	0	-

NOTE: Non-Arabic speaking students register for the following course instead of (ARB 101):

Course Number	Course Title	Credit Hours	Weekly Hours	
			Lecture	Lab
ARB 101A	Fundamentals of Arabic language for Non-Arabs	3	3	0

## 2. Faculty Requirements (27 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
MATH 101	Calculus I	3	3	0	-
MATH 102	Calculus II	3	3	0	MATH 101
MATH 241	Discrete Mathematics	3	3	0	-
CS 101	Introduction to Programming	3	3	0	CIS 100 or Concurrent
CS 102	Programming Lab	1	0	3	CS 101 or Concurrent
CS 112	Introduction to Object-Oriented Programming	3	3	0	Passing CS 102
CS 113	Object-Oriented Programming Lab	1	0	3	CS 112 or concurrent
CS 211	Data Structures	3	3	0	MATH 241 + Passing CS 112
CIS 200	Professional & Ethical Issues in Computing	1	1	0	-
CIS 201	Introduction to Web Design	1	0	3	CS 113
CIS 202	Communication Skills	2	2	0	CIS 200 or Concurrent
CIS 221	Fundamentals of Database Systems	3	3	0	CS 211

**3. Departmental Requirements (80 CHs):****3-a) Mandatory Departmental Courses (68 CHs):**

Course Number	Course Title	Credits Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
CPE 236	Digital Logic Design	3	3	0	CS 113
MATH 233	Probability & Statistics <i>(for CS Students)</i>	3	3	0	MATH 102
CPE 200	Numerical Analysis	2	2	0	MATH 102
CS 284	Analysis and Design of Algorithms	3	3	0	CS 211
CS 318	Human-Computer Interaction	3	3	0	SE 310
CS 375	Principles of Modern Operating Systems	3	3	0	CS 284
CIS 341	Web Applications Development	3	3	0	CIS 201
CIS 441	Business Data Communication	3	3	0	CS 211 + CPE 236
SE 210	Java Programming	3	3	0	Passing CS 113
SE 220	Software Modeling	3	3	0	CS 112
SE 230	Fundamentals of Software Engineering	3	3	0	CS 211
SE 310	Visual Programming	3	3	0	CS 211 + Passing SE 210
SE 320	System Analysis and Design	3	3	0	SE 230 + CIS 221
SE 321	Software Requirements Engineering	3	3	0	SE 220 + SE 320
SE 323	Software Documentation	2	2	0	SE 230
SE 324	Software Architecture & Design	3	3	0	SE 320
SE 326	Software Engineering Lab	1	0	3	SE 310
SE 371	Client/Server Programming	3	3	0	SE 310
SE 390	Practical Training	3	0	0	Completion of (90 CHs)
SE 430	Software Testing	3	3	0	SE 320
SE 431	Software Security	3	3	0	SE 324 + CPE 200
SE 432	Software Engineering for Web Applications	3	3	0	CIS 341 + SE 371
SE 440	Project Management	3	3	0	SE 320
SE 491	Graduation Project I	1	0	0	Completion of ( 90 CHs)
SE 492	Graduation Project II	2	0	0	SE 491

**3-b) Department Elective Courses (12 CHs): (\*)**

- Student must select at least 6 CHs from the Software Engineering department.

Course Number	Course Title	Credits	Weekly Hours		Prerequisite
			Lecture	Lab	
CS 485	Multimedia Systems and Networking	3	3	0	CS 375 + CIS 441
CS 486	Simulation and Modeling	3	3	0	MATH 233 + CS 211
CIS 421	Database Applications	3	3	0	CIS 221
CIS 476	Cloud Computing	3	3	0	CIS 441
SE 401	Software Engineering Economics	3	3	0	SE 230
SE 411	Component-Based Software Development	3	3	0	SE 230
SE 417	Software Engineering Tools	3	3	0	SE 230
SE 420	Formal Methods in Software Engineering	3	3	0	MATH 241 + SE 321
SE 441	Software Quality Assurance	3	3	0	SE 324
SE 442	Software Maintenance and Evolution	3	3	0	SE 230
SE 472	Embedded Software Engineering	3	3	0	SE 324
SE 473	Large Scale Systems Design	3	3	0	SE 324
SE 493	Special Topics in Software Engineering 1	1	1	0	Department Approval
SE 494	Special Topics in Software Engineering 2	2	2	0	Department Approval
SE 495	Special Topics in Software Engineering 3	3	3	0	Department Approval
SE 496	Special Topics in Software Requirements Engineering	3	3	0	SE 321
SE 497	Special Topics in Software Design	3	3	0	SE 324
SE 498	Special Topics in Software Testing & Debugging	3	3	0	SE 430
SE 499	Special Topics in Software Security	3	3	0	SE 431
-	Courses from other departments in the faculty (400 level and above)	-	-	-	Department Approval

(\*) Students who are trained in academy or professional training programs in the Faculty of Computer and Information Technology with at least 150 training hours and pass the corresponding international certification exam are exempted from 3 CHs.

## Course Numbering Convention:

<b>Digit</b>	<b>Meaning</b>	<b>Explanation</b>	
Hundreds	Course Level	1	First year
		2	Second year
		3	Third year
		4	Forth year
Tens	Course Subject	0	Software Engineering Basics
		1	Programming Languages
		2	Modeling, Analysis and Design
		3	Development and Testing
		4	Management and Quality
		5	Computer Organization and Architecture
		6	Artificial Intelligence
		7	Systems Programming
		8	Miscellaneous
9	Special Topics and Training		
Ones	Course Sequence	Course sequence number within Subject area	

# Recommended Study Plan

## 1<sup>st</sup> Year

<b>First Semester</b>			
<b>Course Number</b>	<b>Course Name</b>	<b>Credits</b>	<b>Prerequisite</b>
MATH 101	Calculus I	3	-
CIS 100	Computer Skills	3	-
CS 101	Introduction to Programming	3	CIS 100 or concurrent
CS 102	Programming Lab	1	CS 101 or concurrent
ENG 111	English Language I	3	Passing ENG 099
ARB 101	Arabic Language	3	-
HSS 100	Culture and University Behavior	1	-
<b>Total Hours</b>		<b>17</b>	

<b>Second Semester</b>			
<b>Course Number</b>	<b>Course Name</b>	<b>Credits</b>	<b>Prerequisite</b>
MATH 102	Calculus II	3	MATH 101
CS 112	Introduction to Object-Oriented Programming	3	Passing CS 102
CS 113	Object –Oriented Programming Lab	1	CS 112 or concurrent
MATH 241	Discrete Mathematics	3	-
ENG 112	English Language II	3	ENG 111
MS 100	Military Science	3	-
<b>Total Hours</b>		<b>16</b>	

## 2<sup>nd</sup> Year

<b>First Semester</b>			
<b>Course Number</b>	<b>Course Name</b>	<b>Credits</b>	<b>Prerequisite</b>
CS 211	Data Structures	3	Passing CS 112 + MATH 241
CIS 200	Professional & Ethical Issues in Computing	1	-
CIS 201	Introduction to Web Design	1	CS 113
CIS 202	Communication Skills	2	CIS 200 or Concurrent
SE 210	Java Programming	3	Passing CS 113
SE 220	Software Modeling	3	CS 112
CPE 236	Digital Logic Design	3	CS 113
<b>Total</b>		<b>16</b>	

<b>Second Semester</b>			
<b>Course Number</b>	<b>Course Name</b>	<b>Credits</b>	<b>Prerequisite</b>
MATH 233	Probability & Statistics ( <i>for CS Students</i> )	3	MATH 102
CS 284	Analysis and Design of Algorithms	3	CS 211
CIS 221	Fundamentals of Database Systems	3	CS 211
SE 230	Fundamentals of Software Engineering	3	CS 211
-	University Elective	3	-
<b>Total</b>		<b>15</b>	



## 3<sup>rd</sup> Year

<b>First Semester</b>			
Course Number	Course Name	Credits	Prerequisite
CIS 341	Web Applications Development	3	CIS 201
CIS 441	Business Data Communication	3	CS 211
SE 310	Visual Programming	3	CS 211 + Passing SE 210
SE 320	System Analysis and Design	3	SE 230 + CIS 221
CPE 200	Numerical Analysis	2	MATH 102
SE 323	Software Documentation	2	SE 230
<b>Total</b>		<b>16</b>	

<b>Second Semester</b>			
Course Number	Course Name	Credits	Prerequisite
CS 375	Principles of Modern Operating Systems	3	CS 284
SE 321	Software Requirement Engineering	3	SE 220 + SE 320
SE 324	Software Architecture & Design	3	SE 320
CS 318	Human Computer Interaction	3	SE 310
SE 371	Client/Server Programming	3	SE 310
SE 326	Software Engineering Lab	1	SE 310
<b>Total</b>		<b>16</b>	

<b>Summer Semester</b>			
Course Number	Course Name	Credits	Prerequisite
SE 390	Practical Training	3	Completion of 90 CHs
<b>Total</b>		<b>3</b>	

## 4<sup>th</sup> Year

<b>First Semester</b>			
Course Number	Course Name	Credits	Prerequisite
SE 430	Software Testing	3	SE 320
SE 431	Software Security	3	SE 324 + CPE 200
SE 491(*)	Graduation Project I	1	Completion of 90 CHs
-	Department Elective	3	-
-	Department Elective	3	-
-	University Elective	3	-
<b>Total</b>		<b>16</b>	

<b>Second Semester</b>			
Course Number	Course Name	Credits	Prerequisite
SE 440	Project Management	3	SE 320
SE 492	Graduation Project II	2	SE 491
SE 432	Software Engineering for Web Applications	3	CIS 341 + SE 371
-	Department Elective	3	-
-	Department Elective	3	-
-	University Elective	3	-
<b>Total</b>		<b>17</b>	

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(\*) Students must register "SE 491" before the graduation semester (Semester 1 or Semester 2).

# Software Engineering Department

## Course Description (2015-2016)

### **SE 210: Java Programming**

**(3C, 3H, 0L)**

*Prerequisite: Passing CS 113*

Covers structured programming in Java object-oriented programming, inheritance, interfaces, polymorphism, over loading, Graphical User Interfaces (GUI), I/O streams, exceptions, multithreading, layout manager and applications including client-server.

### **SE 220: Software Modeling**

**(3C, 3H, 0L)**

*Prerequisite: CS 112*

Introduction to the concepts of object-oriented software modeling (techniques and methodologies). A general modeling language (e.g., UML), structure modeling, behavior modeling, domain modeling, architecture modeling, model checking, limitations of modeling, validation of models, comparison of different approaches considering their advantages and disadvantages. An internal laboratory is included.

### **SE 230: Fundamentals of Software Engineering**

**(3C, 3H, 0L)**

*Prerequisite: CS 211*

Develop a strong foundation in software engineering with this exploration of key development processes. Topics include process definition and maturity; the system development life cycle; software life cycles and methodologies; requirements analysis and specification; architectural design, integration and testing.

### **SE 310: Visual Programming**

**(3C, 3H, 0L)**

*Prerequisite: Passing SE 210 + CS 211*

Fundamentals programming, new programming features such as, LINQ, Auto implemental properties, and implicitly typed variables. Object oriented programming concepts such as inheritance interfaces. GUI Graphics and Multimedia such as, WPF, XAML, and WINFORMS. WEB/DATABASE concepts such as, XML, LINO To XML, Database, SQL, LINO To SQL.

### **SE 320: System Analysis and Design**

**(3C, 3H, 0L)**

*Prerequisite: SE 230 + CIS 221*

An introduction to the system development life cycle. Emphasis on strategies and techniques of systems planning, analysis and design, documentation, implementation and evaluation. Students are expected to carry out group projects using the system development life cycle.

### **SE 321: Software Requirements Engineering**

**(3C, 3H, 0L)**

*Prerequisite: SE 320 + SE 220*

An introduction to concepts, methods, and tools for the creation of large-scale software systems. Methods, tools, notations, and validation techniques to analyze, specify, prototype, and maintain software requirements. Introduction to object-oriented requirements modeling, including use case modeling, static modeling, and dynamic modeling using the Unified Modeling Language (UML) notation. Concepts and methods for the design of large-scale software systems. Fundamental design concepts and design modeling using UML notation. Students participate in a group project on software requirements, specification, and object-oriented software design.

**SE 324: Software Architecture & Design****(3C, 3H, 0L)***Prerequisite: SE 320*

An overview of principles of object-oriented design through design patterns. A discussion of the design pattern alternatives. Software architecture frameworks. Software Architecture analysis and validation. An introduction to interface design.

**SE 323: Software Documentation****(2C, 2H, 0L)***Prerequisite: SE 230*

An overview of writing methods and practices that software engineers use to create software documentation. The software documentation process. Documenting for the programmer. Documenting system tests. Online documentation. Types of online documentation. User documentation. Types of user manuals. Style and layout. Tutorials. System documentation. Types of system documentation.

**SE 326: Software Engineering Lab****(1C, 0H, 3L)***Prerequisite: SE 310*

In this lab students should build a complete software system including documentation, requirements specification, risk analysis, design models, testing plans, and user manual. Student should learn how to work as a team.

**SE 371: Client/Server Programming****(3C, 3H, 0L)***Prerequisite: SE 310*

This course covers several aspects for client-server systems, including: client-server models, transaction processing, communications, programming, security, middleware, developments.

**SE 390: Practical Training****(3C)***Prerequisite: Completing of 90 CHs*

Students will train in companies, factories, governmental agencies, private institutions, etc., in a pre-approved computer-related activity for a period of eight weeks under the supervision of a faculty member.

**SE 401: Software Engineering Economics****(3C, 3H, 0L)***Prerequisite: SE 230*

The course covers quantitative models of software lifecycle, cost-effectiveness analysis in software engineering, multiple- goal decision analysis, uncertainty and risk analysis, software cost estimation, software engineering metrics; and quantitative lifecycle management techniques.

**SE 411: Component-Based Software Development****(3C, 3H, 0L)***Prerequisite: SE 230*

Introduces concepts and foundations of software component and component-based software development. Detailed study of engineering principles of modeling, designing, implementing, testing, and deploying component-based software architectures. Also explores state-of-the-art component technologies.

**SE 417: Software Engineering Tools****(3C, 3H, 0L)***Prerequisite: SE 230*

Developing models of systems & software; Verifying model properties; fixing wrong models; Generating systems from models—statically and dynamically; Extending generated parts – statically and dynamically; Composing parts (in sensible ways) – statically & dynamically; Adaptive, dynamic, service-oriented architectures; Automated testing techniques – proactive & reactive; Practical, realistic applications using these techniques

**SE 420: Formal Methods in Software Engineering****(3C, 3H, 0L)***Prerequisite: SE 321 + MATH 241*

This course introduces the use of formal mathematical notation and reasoning in the software development process. These methods have applications in requirements specification, design and verification. Course topics include mathematical foundations, predicates, preconditions and post conditions, alternative notations, types of formal models, and the strengths and limitations of formal methods.

**SE 430: Software Testing****(3C, 3H, 0L)***Prerequisite: SE 320*

Concepts and techniques for testing and modifying software in evolving environments. Topics include software testing at the unit, module, subsystem, and system levels; automatic and manual techniques for generating test data; testing concurrent and distributed software; designing and implementing software to increase maintainability and reuse.

**SE 431: Software Security****(3C, 3H, 0L)***Prerequisite: SE 324 + CPE 200*

Theory and practice of software security, focusing in particular on some common software security risks, including buffer overflows, race conditions and random number generation, and on identification of potential threats and vulnerabilities early in design cycle. Emphasizes methodologies and tools for identifying and eliminating security vulnerabilities, techniques to prove absence of vulnerabilities, ways to avoid security holes in new software, and essential guidelines for building secure software: how to design software with security in mind from the ground up and to integrate analysis and risk management throughout the software life cycle.

**SE 432: Software Engineering for Web Applications****(3C, 3H, 0L)***Prerequisite: CIS 341 + SE 371*

Detailed study of engineering methods and technologies for building highly interactive web sites for e-commerce and other web-based applications. Presents engineering principles for building web sites that exhibit high reliability, usability, security, availability, scalability, and maintainability. Teaches methods such as client-server programming, component-based software development, middleware, and reusable components.

**SE 440: Project Management****(3C, 3H, 0L)***Prerequisite: SE 320*

Introduce basic concepts such as the definition of a project, the nature of the project team, and the role of the project manager. Examines techniques related to project formation, acceptance, and funding. Covers the project life cycle, work breakdown structure (WBS), Gantt charts, network diagrams, scheduling techniques, and resource allocation/estimation including return on investment, cost/benefit analysis and earned value. Emphasizes the role of contingency management in planning.

**SE 441: Software Quality Assurance****(3C, 3H, 0L)***Prerequisite: SE 324*

This course covers a broad range of topics related to software quality assurance (SQA). The course will explore combined application of a variety of SQA components, including: SQA activities typically performed by external participants; extension of SQA activities to project schedules and budget control; SQA implementation issues, SQA risk management considerations; and costs associated with SQA.

**SE 442: Software Maintenance and Evolution****(3C, 3H, 0L)***Prerequisite: SE 230*

Introduction to Software Evolution, Maintenance and Reengineering. Reverse Engineering: Program Analysis, Architecture Recovery, Software Complexity and Maintenance Metrics, Program Visualization. Forward Engineering: Refactoring, Code Transformation, Web-enabling. Software Reengineering Strategies and Management.

**SE 472: Embedded Software Engineering****(3C, 3H, 0L)***Prerequisite: SE 324*

Architecture of embedded systems and explore the difference between embedded design and traditional software engineering. The special demands on embedded systems including real-time programming, portability, low power usage, and miniaturization approach. The course introduces models and architectures, and covers such topics as specification, system partitioning, design quality, and developing synthesizable models.

**SE 473: Large Scale Systems Design****(3C, 3H, 0L)***Prerequisite: SE 324*

The course describes the lifecycle of computer systems, and explains how they may be specified, designed, and implemented. Systems analysis is presented as a way of gathering and structuring information such that the required specification corresponds closely to the users' requirements. Systems design is then presented as a technique for transforming the specification to a form in which it can be implemented. The course considers thoroughly the activities which are required and the tools which are available to manage commercial software development projects. Real case studies will be used to illustrate many of the tools and techniques introduced.

**SE 491: Graduation Project I****(1C)***Prerequisite: Completing of 90 C.H*

Provides the senior student with the opportunity to undertake a substantial graduation project under the supervision of a faculty member. At least two weeks prior to registration, an interested student must submit to the department chair a written request for permission to select a project. The request is to include a preliminary description of the proposed project and the name of the supervising faculty member. During this course, the student is expected to specify and design the proposed system or software.

**SE 492: Graduation Project II****(2C)***Prerequisite: SE 491*

This is a continuation of SE 491, where the student implements, tests and presents the proposed system or software to a 3-member faculty committee that includes the project's supervisor. A written report is to be submitted to the department and committee.

**SE 493: Special Topics in Software Engineering I** (1C)

*Prerequisite: Department approval*

This course should cover state-of-the-art problems and solutions in software engineering.

**SE 494: Special Topics in Software Engineering II** (2C)

*Prerequisite: Department approval*

This course should cover state-of-the-art problems and solutions in software engineering.

**SE 495: Special Topics in Software Engineering III** (3C)

*Prerequisite: Department approval*

This course should cover state-of-the-art problems and solutions in software engineering.

**SE 496: Special Topics in Software Requirements Engineering** (3C)

*Prerequisite: SE 321*

This course should cover state-of-the-art problems and solutions in Software Requirements Engineering.

**SE 497: Special Topics in Software Design** (3C)

*Prerequisite: SE 324*

This course should cover state-of-the-art problems and solutions in Software Design.

**SE 498: Special Topics in Software Testing and Debugging** (3C)

*Prerequisite: SE 430*

This course should cover state-of-the-art problems and solutions in Testing and Debugging.

**SE 499: Special Topics in Software Security** (3C)

*Prerequisite: SE 431*

This course should cover state-of-the-art problems and solutions in Software Security.