

King Fahd University of Petroleum & Minerals
College of Compute Sciences and Engineering
Information and Computer Science Department

Software Engineering
Student Guide

Based on the revised Computer Science Curriculum

June 2007

BS (Software Engineering)

Software engineering focuses on creating high-quality software in a systematic, controlled, and efficient manner. Consequently, it emphasizes on analysis and evaluation, specification, design, and evolution of software. In addition, vital issues in software engineering relate to: management, quality, novelty, creativity, standards, individual skills, teamwork and professional practice. The discipline of software engineering can be seen as an engineering field with a strong connection to its underlying computer science discipline. The Department of Information and Computer Science offers a BS in Software Engineering.

Goal

Our goal has been, and continues to be, a high quality degree program in Software Engineering that prepares students for lifelong learning as they undertake professional careers in computing. The program prepares students to work as requirements engineer, software architect, software design engineer, software quality engineer, software developer, software test engineer, software engineering project manager.

Mission

To bring forth competent Software Engineers with a strong understanding of computer science bodies of knowledge and theories, who can apply sound engineering principles and methods to the cost-effective creation, development, operation, and maintenance of high-quality software and are prepared for lifelong learning.

Objectives

The Program will prepare students to:

1. Demonstrate the ability to apply proper theoretical, technical, and practical knowledge of software requirements, analysis, design, implementation, verification and validation, and documentation.
2. Resolve conflicting project objectives considering viable tradeoffs within limitations of cost, time, knowledge, existing systems, and organizations.
3. Develop appropriate design solutions to a given problem using software engineering approaches that integrate ethical, social, legal, and economic concerns
4. Demonstrate the ability to work as an individual with minimum guidance and as a leader/member of a team to develop and deliver quality software artifacts with effective communication skills.
5. Develop abilities to engage in lifelong learning of software engineering theories and technologies

Program outcomes:

The department has identified the following outcomes for the graduating students. Graduates will be able to:

1. Apply their knowledge of mathematics, sciences, and computer science to the modeling, analysis, and measurement of software artifacts.
2. Work effectively as leader/member of a development team to deliver quality software artifacts.
3. Analyze, specify and document software requirements for a software system.
4. Develop alternative design solutions to a given problem and recommend the best one within limitations of cost, time, knowledge, existing systems, and organizations.
5. Implement a given software design using sound development practices.
6. Verify, validate, assess and assure the quality of software artifacts.
7. Design, select and apply the most appropriate software engineering process for a given project, plan for a software project, identify its scope and risks, and estimate its cost and time.
8. Express and understand the importance of negotiation, effective work habits, leadership, and good communication with stakeholders, in written and oral forms, in a typical software development environment.
9. Understand the impact of computing solutions in a global and societal context.
10. Recognize and be guided by the social, professional, legal, ethical issues involved in the use and development of computer & software technology.
11. Keep abreast of current developments in the discipline to continue their own professional development and life-long learning.
12. Employ appropriate methods and tools for the specification, design, implementation, and evaluation of software systems.

The Program Requirements

a. General Education Requirements (55 credits)

Basic Science	CHEM 101(4),	PHYS 101(4),	PHYS 102(4)
Mathematics	MATH 101(4),	MATH 102(4),	MATH 201(3), MATH 260(3)
Statistics	STAT 319(3)		
Isla. & Ara. Stu.	IAS 101(2),	IAS 111(2),	IAS 201(2), IAS 212(2),
	IAS 301(2),	IAS 322(2)	
English	ENGL 101(3),	ENGL 102(3),	ENGL 214(3)
SE	SE 307 (3)		
Physical Edu.	PE 101(1),	PE 102(1)	

b. Core Requirements (61 credits)

SWE	SWE 214(4),	SWE 312(3),	SWE 316(3),	SWE 344(3),
	SWE 415(3),	SWE 417(3),	SWE 418(3),	SWE 444(3)
ICS	ICS 102(3),	ICS 201(4),	ICS 202(4),	ICS 233(4),
	ICS 253(3),	ICS 324(4),	ICS 353(3),	ICS 410(3),
	ICS 431(4)			
COE	COE 202(3),	COE 203(1)		

c. Elective (15 credits)

SWE/ICS Electives	SWE/ICS xxx(3),	SWE/ICS xxx(3),	SWE/ICS xxx(3)
Free Electives	XE xxx(3),	XE xxx(3)	

d. Summer Training (Pass/Fail grade; No credits)

The prerequisites for summer training:

- Student is currently enrolled in the university.
- Student has completed 65 credits or more (including current semester)
- Students has completed or currently doing ENGL 214, ICS 324 and SWE 316.
- Summer training is not in the last semester for the student at the university.

Every student is required to participate in a summer training program of real practical experience and submit a formal written report.

e. Total Requirements

The total required credits for the BS degree in Software Engineering are 131 semester-credit-hours.

Curriculum

BS (Software Engineering) Program

Course		Title	LT	LB	CR	Course		Title	LT	LB	CR
First Year (Preparatory)											
ENGL	001	Preparatory English I	15	5	8	ENGL	002	Preparatory English II	15	5	8
MATH	001	Preparatory Math I	3	1	4	MATH	002	Preparatory Math II	3	1	4
ME	001	Preparatory Engg. Tech.	0	2	1	PYP	001	Prep Physical Science	2	0	2
PYP	002	Prep Computer Science	0	2	1	PYP	003	Student Study Skills	0	2	1
PE	001	Prep Physical Educ. I	0	2	1	PE	002	Prep Physical Educ. II	0	2	1
			18	12	15				20	10	16
Total Credit required in Preparatory Program: 31											
Second Year (Freshman)											
MATH	101	Calculus I	4	0	4	MATH	102	Calculus II	4	0	4
PHYS	101	General Physics I	3	3	4	PHYS	102	General Physics II	3	3	4
PE	101	Physical Education I	0	2	1	ENGL	102	Intro to Report Writing	3	0	3
CHEM	101	General Chemistry I	3	4	4	ICS	102	Intro. To Computing I	2	3	3
ENGL	101	An intro to Academic Discourse	3	0	3	IAS	101	Practical Grammar	2	0	2
			13	9	16				14	6	16
Third Year (Sophomore)											
ICS	201	Intro. To Computing II	3	3	4	ICS	202	Data Structures	3	3	4
PE	102	Physical Education II	0	2	1	SWE	214	Introduction to SW Eng.	3	3	4
COE	202	Digital Logic Design	3	0	3	ICS	233	Comp. Org.&Assem. Lang	3	3	4
MATH	201	Calculus III	3	0	3	ICS	253	Discrete Structures I	3	0	3
IAS	111	Belief and its Effects	2	0	2	IAS	212	Professional Ethics	2	0	2
ENGL	214	Academic & Professional Communication	3	0	3	COE	203	Digital Logic Lab	0	3	1
			14	5	16				14	12	18
Fourth Year (Junior)											
SE	307	Eng. Economics Analysis	3	0	3	SWE	312	User-Interface Design	3	0	3
ICS	353	Design & Anal. of Algo.	3	0	3	SWE	316	SW Design and Arch.	3	0	3
ICS	324	Database Systems	3	3	4	SWE	344	Internet Prot. & C-S Prg.	2	3	3
STAT	319	Prob.& Stat. for Engrs	2	3	3	MATH	260	Lin. Alg. & Diff. Equation	3	0	3
IAS	201	Objective Writing	2	0	2	IAS	322	Human Rights in Islam	2	0	2
XE	xxx	(Elective I)	3	0	3	SWE	xxx	(SWE/ICS Elective I)	3	0	3
			16	6	18				16	3	17
Fifth Year (Senior)											
SWE	415	SW Testing & QA	3	0	3	SWE	418	SWE Project II	1	6	3
SWE	444	Internet & Web App. Dev.	3	0	3	ICS	431	Operating Systems	3	3	4
SWE	417	SWE Project I	2	3	3	SWE	xxx	(SWE/ICS Elective III)	3	0	3
ICS	410	Programming Languages	3	0	3	IAS	301	Language Com. Skills	2	0	2
SWE	xxx	(SWE/ICS Elective II)	3	0	3	XE	xxx	(Elective II)	3	0	3
			14	3	15				12	9	15
Total credits required in Degree Program: 131											

List of Courses

A. SWE Core Subjects

1.	SWE 214	Introduction to Software Engineering	3	3	4
2.	SWE 312	User Interface Design	3	0	3
3.	SWE 316	Software Design and Architecture	3	0	3
4.	SWE 344	Internet Protocols and Client-Server Prog.	2	3	3
5.	SWE 415	Software Testing and Quality Assurance	3	0	3
6.	SWE 417	Software Engineering Project I	2	3	3
7.	SWE 418	Software Engineering Project II	1	6	3
8.	SWE 444	Internet and Web Application Development	3	0	3
9.	ICS 102	Introduction to Computing I	2	3	3
10.	ICS 201	Introduction to Computing II	3	3	4
11.	ICS 202	Data Structures	3	3	4
12.	ICS 233	Computer Organization & Assembly Language	3	3	4
13.	ICS 253	Discrete Structures I	3	0	3
14.	ICS 324	Database Systems	3	0	4
15.	ICS 353	Design and Analysis of Algorithm	3	0	3
16.	ICS 410	Programming Languages	3	0	3
17.	ICS 431	Operating Systems	3	3	4
18.	COE 202	Digital Logic Design	3	0	3
19.	COE 203	Digital Logic Lab	0	3	1

B. SWE/ICS Electives

1.	SWE 321	Formal Methods and Models in Software Eng.	3	0	3
2.	SWE 322	Principles of Concurrent Software Systems	3	0	3
3.	SWE 421	Principles of Information Security	3	0	3
4.	SWE 422	Real-Time Software Systems	3	0	3
5.	SWE 423	Multimedia Systems	3	0	3
6.	SWE 446	Selected Topics on Emerging Internet Tech.	2	3	3
7.	SWE 490	Special Topic I	3	0	3
8.	SWE 491	Special Topic II	3	0	3
9.	ICS 343	Fundamentals of Computer Networks	3	3	4
10.	ICS 355	Theory of Computing	3	0	3
11.	ICS 381	Principals of Artificial Intelligence	3	0	3
12.	ICS 412	Compiler Construction Techniques	3	0	3
13.	ICS 415	Computer Graphics	3	0	3
14.	ICS 424	Advanced Database Systems	3	0	3
15.	ICS 426	Data warehousing and Data Management	3	0	3
16.	ICS 436	Systems and Network Administration	3	0	3
17.	ICS 437	Distributed Systems	3	0	3
18.	ICS 441	Cluster Computing	3	0	3
19.	ICS 442	Computer Network Technologies	3	3	4
20.	ICS 443	Network Design and Management	3	0	3
21.	ICS 444	Computer and Network Security	3	0	3
22.	ICS 454	Principals of Cryptography	3	0	3
23.	ICS 481	Artificial Neural Networks	3	0	3
24.	ICS 482	Natural Language Processing	3	0	3
25.	ICS 483	Computer Vision	3	0	3
26.	ICS 484	Arabic Computing	3	0	3
27.	ICS 485	Machine Learning	3	0	3
28.	ICS 486	Multi-agent Systems	3	0	3
29.	ICS 488	Soft Computing	3	0	3

Catalog Description of Courses

The prerequisite diagram for the core courses is given in the following section.

ICS 102 Introduction to Computing I

(2-3-3)

Overview of computers and computing. Introduction to a typical object-oriented programming language. Basic data types and operators. Basic object-oriented concepts. Wrapper classes. Console input/output. Logical expressions and control structures. Classes and methods. Arrays and strings.

Co-requisite: MATH 101 or MATH 132

ICS 201 Introduction to Computing II

(3-3-4)

Advanced object-oriented programming; inheritance; polymorphism; abstract classes and interfaces, container and collection classes, packages, object-oriented design, software modeling, event-driven programming, recursion, use of stacks, queues and lists from API, searching and sorting.

Prerequisite: ICS 102

ICS 202 Data Structures

(3-3-4)

Review of object-oriented concepts; Introduction to design patterns; Basic algorithms analysis; Fundamental data structures - implementation strategies for stacks, queues and linked lists; Recursion; Implementation strategies for tree and graph algorithms; Hash tables; Applications of data structures (e.g. data compression and memory management).

Prerequisite: ICS 201

ICS 233 Computer Architecture and Assembly Language

(3-3-4)

Machine organization; assembly language: addressing, stacks, argument passing, arithmetic operations, decisions, modularization; Input/Output Operations and Interrupts; Memory Hierarchy and Cache memory; Pipeline Design Techniques; Super-scalar architecture; Parallel Architectures.

Prerequisite: COE 202, ICS 201

ICS 253 Discrete Structures I

(3-0-3)

Propositional Logic, Predicate Logic, Sets, Functions, Sequences and Summation, Proof Techniques, Mathematical induction, Inclusion-exclusion and Pigeonhole principles, Permutations and Combinations (with and without repetitions), The Binomial Theorem, Recurrence Relations; Graphs terminology and applications, Connectivity, Isomorphism, Euler and Hamilton Paths and Circuits, Planarity and Coloring; Trees terminology and applications.

Prerequisite: ICS 102

ICS 324 Database Systems

(3-3-4)

Basic database concepts, conceptual data modeling, relational data model, relational theory and languages, database design, SQL, introduction to query processing and optimization, and introduction to concurrency and recovery.

Prerequisite: ICS 202

ICS 353 Design and Analysis of Algorithms (3-0-3)

Algorithms and Problem Solving; Basic Algorithmic Analysis; Advanced algorithmic analysis; Advanced Data Structures; Algorithmic strategies & Analysis of fundamental computing algorithms; Basic computability; The complexity classes P and NP.

Prerequisites: ICS 202 and ICS 253

ICS 410 Programming Languages (3-0-3)

Programming Paradigms: Object-oriented, imperative, functional, and logic. Application development in these paradigms. Fundamentals of Language Design: Syntax and Semantics. Language implementation: virtual machines; compilation, interpretation, and hybrid.

Prerequisite: ICS 202

ICS 431 Operating Systems (3-3-4)

This course introduces the fundamentals of operating systems design and implementation. Topics include history and evolution of operating systems; Types of operating systems; Operating system structures; Process management: processes, threads, CPU scheduling, process synchronization; Memory management and virtual memory; File systems; I/O systems; Security and protection; Distributed systems; Case studies.

Prerequisite: ICS 233.

SWE 214 Intro to Software & Requirements Engineering (3-3-4)

Study of software engineering process models, requirements engineering process, and system models. Methods, tools, notations, and verification and validation techniques for the analysis and specification of software requirements. Introduction to the principles of project management. Students participate in a group project on software requirements.

Prerequisite: ICS 201

SWE 312 User-Interface Design (3-0-3)

Study of both theoretical and practical issues in human-computer interfaces. Principles of user interface design, development, and programming. Topics include user psychology and cognitive science, adaptive user interfaces, icon and window design, media design, command language design, user guidance systems, and collaborative working.

Prerequisite: ICS 202, SWE 214

SWE 316 Software Design and Architecture (3-0-3)

Study of fundamental design concepts, design notations, and architectural design methods for large-scale software systems. Several design methods are presented and compared, with examples of their use. Concepts such as information hiding, data abstraction, concurrency, and object-oriented software construction are discussed in depth. Students participate in a group project on software design.

Prerequisite: SWE 214, ICS 324

SWE 321 Formal Methods and Models in Software Eng. (3-0-3)

Formal mechanisms for specifying, validating, and verifying software systems. Topics include program verification through Hoare's method and Dijkstra's weakest preconditions; formal specifications, including initial specification and refinement toward implementation; integration

of formal methods with existing programming languages, and the application of formal methods to requirements analysis, testing, safety analysis, and object-oriented approaches.

Prerequisite: SWE 214, ICS 324

SWE 322 Principles of Concurrent Software Systems (3-0-3)

Study of issues related to the development of concurrent software systems. Topics include the basics of synchronization and coordination techniques, concurrent programming languages and constructs and the specification, design, verification, and validation of concurrent programs. Students are required to solve concurrent programming problems and to check their solutions by using verification, testing, and debugging tools.

Prerequisites: ICS 202

SWE 344 Internet Protocols and Client-Server Prog. 2-3-3)

Principles of Internetwork architecture and communication protocols. Open systems and interoperability. Wide area connectivity through interconnection of autonomous networks. Case studies of particular protocols from network layer and above. Selected examples of networked client-server applications such as e-mail, news, file-transfer, HTTP. Socket programming. Programming Project(s).

Prerequisites: ICS 202

SWE 415 Software Testing and Quality Assurance (3-0-3)

Concept of software quality, software metrics, & Total Quality Management. SQA planning & implementation. Validation & verification. Reviews, walkthroughs, & inspections. Introduction to formal mechanisms for validating software systems. Automatic and manual techniques for generating and validating test data. Static vs. dynamic analysis, functional testing, inspections, and reliability assessment. Students participate in a group project on software validation and verification.

Prerequisite: ICS 253, SWE 316 and STAT 319

SWE 417 Software Engineering Project I (2-3-3)

Principles of software project management; cooperative work; metrics; cost estimation; software project planning, organizing, resource allocation, directing and controlling; risk management; software configuration management; reuse management; role of standards; management tools; case studies.

Students work in teams to analyze, design, and manage a software project up to the development of the design document. Sound principles of software systems engineering, along with both industrial and academic standards are used to assess the quality of the work products.

Co-requisite: SWE 415

SWE 418 Software Engineering Project II (1-6-3)

A continuation of the work done in SWE 417. Students implement their designed software, and test and evaluate and their final product.

Prerequisite: SWE 417

SWE 421 Principles of Information Security (3-0-3)

Study of security policies, models, and mechanisms for secrecy, integrity, and availability. Topics include mechanisms for mandatory and discretionary controls; data models, concepts, and mechanisms for database security; basic cryptography and its applications; security in computer

networks and distributed systems; and control and prevention of viruses and other rogue programs.

Prerequisites: ICS 324

SWE 422 Real-Time Software Systems (3-0-3)

Real-time software systems and the principles supporting their design and implementation. Emphasis is placed upon fundamental results from real-time scheduling theory and their relevance to computer system design. Topics include a survey of real-time design methods, real-time programming languages, exception handling, reliability, and data acquisition.

Prerequisites: Senior Standing

SWE 423 Multimedia Systems (3-0-3)

Why multimedia System? Fonts and hypertext. Digital audio. Synthesized audio & MIDI. Audio on the Internet & audio streaming. Speech recognition. Computer graphics and images. Image formats and standards. Color models in images. Image compression. Principles of animation. Digital video. Video compression. Video on the Internet & video streaming. Videoconferencing. Multimedia software tools. Issues in multimedia applications design. Multimedia programming techniques.

Prerequisites: Senior Standing

SWE 444 Internet and Web Application Development (3-0-3)

Frameworks for web-application development. Component Architectures. Multi-tier Applications. End-to-end functional building blocks and their use in adaptive and non-adaptive applications, including multimedia: coding, compression, security, and directory services. Database connectivity. Integration of media services into applications.

Prerequisites: Senior Standing

SWE 446 Selected Topics on Emerging Internet Technologies (2-3-3)

Design and implementation of computer models of learning and adaptation in autonomous intelligent agents. E-commerce models and architectures. IP telephony and video conferencing. Designing applications to support user mobility. Emulation of virtual application specific network architectures. Trends and new directions in Internet technologies, protocols, architectures, and applications.

Prerequisites: SWE 344

SWE 490 Special Topics I (3-0-3)

State-of-the-art topics in Software Engineering

Prerequisites: Senior Standing

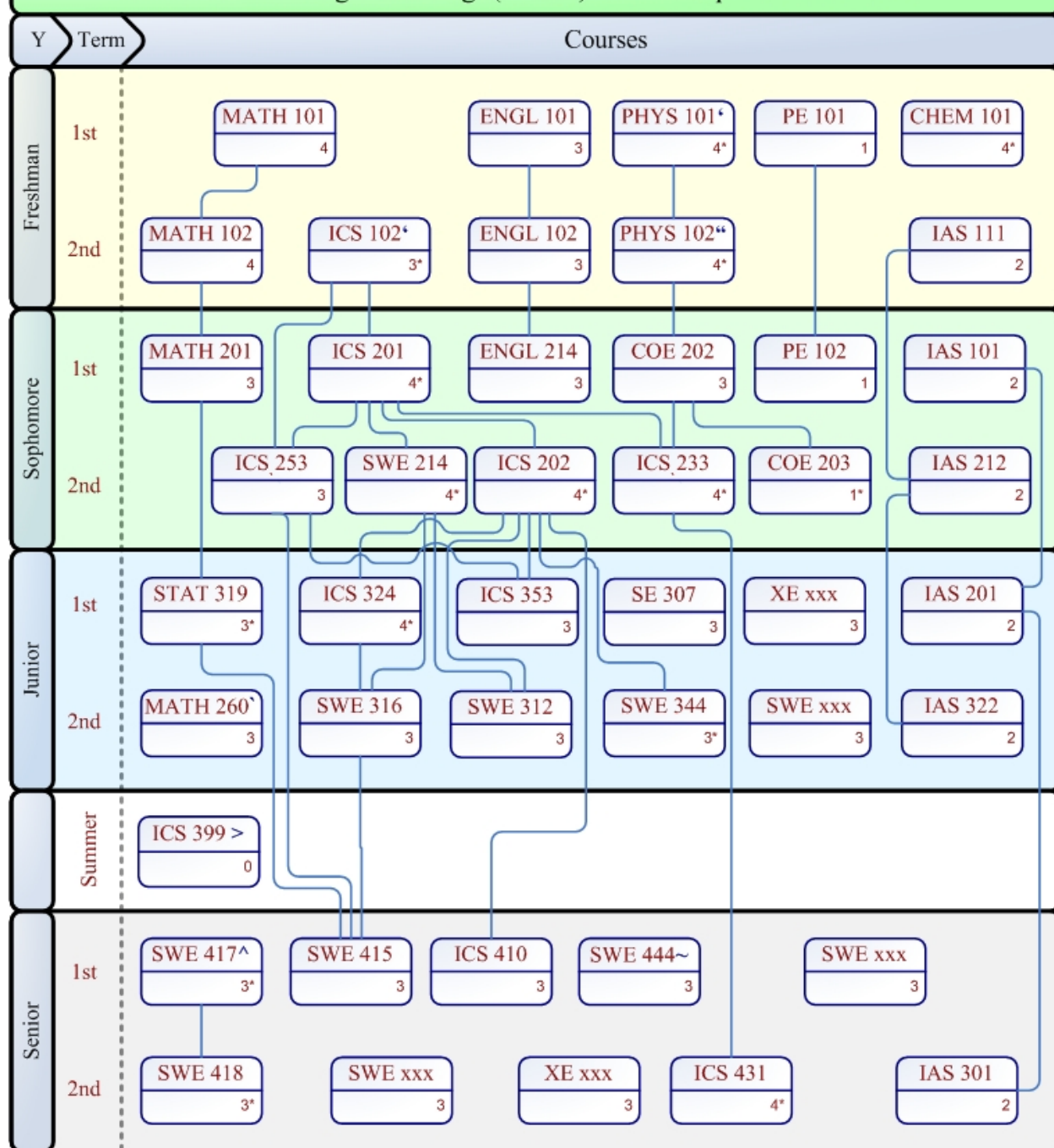
SWE 491 Special Topics II (3-0-3)

State-of-the-art topics in Software Engineering.

Prerequisites: Senior Standing



Software Engineering (SWE) Pre-Requisites Chart



> Pre-requisites for Summer Training (ICS 399): ENGL 214, ICS 324, SWE 316, and Junior Standing

❖ Key:

* Co-requisite: Math 101

^ Co-requisite: SWE 415

** Co-requisite: Math 102

~ Pre-requisite: Senior Standing

` Co-requisite: Math 201

* Requires Lab work

Designed By: Azam!

Approved Free Electives for the Software Engineering Program
(Approved on January 2007-Updated on June 2007)

#	Course #	Course Name	Credits	Pre-requisites
1.	ACCT 201	Principles of Accounting I	3	Sophomore standing, MIS 101**, MATH 132**
2.	ACCT 202	Principles of Accounting II	3	ACCT 201
3.	ACCT 301	Intermediate Accounting I	3	ACCT 202
4.	ACCT 401	Cost Accounting	3	ACCT 202
5.	AE 220	Introduction to Aerospace Engineering	3	PHYS 102
6.	AE 410	Astronautics	3	PHYS 102
7.	ARE 444	Knowledge-Based Systems in Buildings	3	ICS 102, ARE 221; or Consent from Instructor
8.	CE 341	Transportation Engineering	3	PHYS 101, Junior Standing
9.	CHEM 431	Chemistry of the Environment	3	CHEM 331 or Permission from the Instructor
10.	COE 305	Microprocessor System Design	4	COE 205 (ICS 232 equivalent)
11.	COE 308	Computer Architecture	3	COE 205
12.	COE 342	Data and Computer Communications	3	STAT 319
13.	COE 402	Computer System Performance Evaluation	3	STAT 319 or Consent of Instructor
14.	COE 403	Advanced Microprocessor Architecture	3	COE 305
15.	COE 405	Design and Modeling of Digital Systems	3	COE 308 or consent of instructor
16.	COE 406	RISC Architectures	3	COE 308
17.	COE 420	Parallel Computing	3	COE 308
18.	COE 421	Fault-Tolerant Computing	3	COE 308
19.	COE 443	High Speed Networks	3	COE 342 or consent of instructor
20.	COE 484	Introduction to Robotics	3	Senior Standing
21.	COE 488	Data Acquisition Interfacing	3	COE 305
22.	ECON 101	Principles of Economics I (MICRO)	3	
23.	ECON 202	Principles of Economics II (MACRO)	3	ECON 101
24.	ECON 301	Intermediate Microeconomic Theory	3	ECON 202
25.	ECON 305	Money and Banking	3	ECON 202
26.	ECON 306	Economy of Saudi Arabia	3	ECON 202
27.	ECON 410	International Economics	3	ECON 202
28.	EE 446	Programmable Logic Controllers	3	Senior Standing
29.	GEOL 202	Applied Geosciences for Scientists and Engineers	3	None
30.	GEOP 202	Introduction to Geophysics	3	MATH 102, PHYS 102
31.	GS 221	Principles of Sociology	3	
32.	GS 321	Principles of human Behavior	3	
33.	GS 423	International Relations	3	
34.	GS 424	Planning and Social Development	3	
35.	GS 427	Human and Environment	3	

#	Course #	Course Name	Credits	Pre-requisites
36.	MATH 311	Advanced Calculus I	3	MATH 201
37.	MATH 430	Introduction to Complex Variables	3	MATH 201
38.	MATH 440	Differential Geometry	3	MATH 260 or MATH 280
39.	MATH 472	Numerical Analysis II	3	MATH 321, or SE 301
40.	MATH 480	Linear & Nonlinear Programming	3	MATH 280 (MATH260), ICS 102
41.	MATH 495	Industrial Mathematics.	3	MATH 301, MATH 321; or Instructor's Consent
42.	ME 203	Thermodynamics I	3	MATH 102, PHYS 102
43.	ME 204	Thermodynamics II	3	ME 203
44.	ME 215	Material Science for ME	3	CHEM 101, MATH 102, PHYS 102
45.	ME 424	Maintenance Engineering	3	STAT 319
46.	MGT 301	Principles of Management	3	Junior Standing
47.	MGT 311	Legal Environment	3	Sophomore Standing
48.	MGT 401	Human Resources Management	3	MGT 301
49.	MIS 345	Information Technology in Society	3	MIS 215**, Junior Standing
50.	MKT 301	Principles of Marketing	3	ECON 202
51.	PHYS 201	General Physics III	3	PHYS102, MATH 102
52.	PHYS 203	Electrical and Magnetic Properties of Materials	3	PHYS102
53.	PHYS 211	Optics	3	PHYS102
54.	PHYS 212	Modern Physics	4	PHYS102
55.	PHYS 215	Introduction to Astronomy	3	PHYS102
56.	PHYS 261	Energy	3	PHYS102
57.	PHYS 271	Introduction to Special Relativity	3	PHYS102
58.	PHYS 301	Classical Mechanics I	3	MATH 202, PHYS101
59.	SE 301	Numerical Methods	3	ICS 101**, MATH 201
60.	SE 303	Operations Research I	4	SE 201, SE 205, or STAT 319
61.	SE 320	Quality Control and Industrial Statistics	4	SE 205, or STAT 319
62.	SE 405	Stochastic Systems Simulation	3	SE 205 or STAT 319
63.	SE 421	Operations Research II	3	SE 303
64.	SE 438	Instrumentation for Process Control	3	SE 312
65.	SE 443	Human Factors Engineering	3	Junior Standing
66.	SE 447	Decision Making	3	SE 205 or Equivalent
67.	SE 463	Theory of Stochastic Systems	3	SE 205 or STAT 319
68.	SE 480	Reliability and Maintainability	3	SE205 or STAT 319; Junior Standing
69.	STAT 301	Introduction to Probability Theory	3	MATH 201
70.	STAT 302	Statistical Inferences	3	STAT 301
71.	STAT 310	Regression Analysis	3	STAT 201**(STAT 319)
72.	STAT 320	Statistical Quality Control	4	STAT 201 or STAT 319

** Students will need special waiver when registering the course.