

Jordan University of Science & Technology

Faculty of

Computer & Information Technology

Curriculum For The Bachelor Degree

IN

COMPUTER ENGINEERING

2009-2010



Study Plan for the Computer Engineering Program 2009-2010

The Bachelor Degree in Computer Engineering is awarded at Jordan University of Science & Technology after the successful completion of 160 credit hours distributed as follows:-

Requirements	Mandatory	Elective	Total
University Requirements	16	9	25
Faculty Requirements	27	-	27
Departmental Requirements	93	15	108
Total	136	24	160

and after fulfilling the terms and conditions for awarding the bachelors 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 ⁽¹⁾	Computer Skills	3	2	3
ENG 111 ⁽²⁾	English Language I	3	3	0
ENG 112 ⁽³⁾	English Language II	3	3	0
HSS 100 ⁽⁴⁾	Culture and University Behavior	1	1	0
MS 100 ⁽⁵⁾	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 (For Non Nursing & Midwifery Students)	3	3	0	-
NF 177	Food Preservation (For Non Nutrition & Food Technology Students) (in English)	3	3	0	-
ADS 100	Oral & Dental Health (For Non Dentistry & Allied Dental Sciences Students)	3	3	0	-
PHAR 104	Drugs and Medicinal Plants: Uses and Side Effect (For Non-Medicine and Pharmacy Students)	3	3	0	-
PH 104	Human Health and Nutrition (For Non-Medicine and Nursing Students)	3	3	0	-
PH 200	First Aid and Emergency Procedures (For Non-Medicine, Pharmacy and Nursing Students)	3	3	0	-
VM 211	Animal Health (For Non-Veterinary Medicine and Agriculture Students)	3	3	0	-
VM 212	Pet Animals Care (For Non-Veterinary Medicine Students)	3	3	0	-
HSS 112	Hadith Shareef	3	3	0	-
HSS 113	Aqideh	3	3	0	-
HSS 114	Fiqeh	3	3	0	-
HSS 115	Islam & Contemporary Problems	3	3	0	-
HSS 116	Islamic Economic System	3	3	0	-
HSS 121	Principles of Sociology (For Non-English Language Students)	3	3	0	-
HSS 126	Principles of Psychology (For Non Nursing & Midwifery Students)	3	3	0	-
HSS 127	Education Technology	3	3	0	-

¹- The student who passes the computer skills exam with 50% or more will be exempted from taking this course.

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

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

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

⁵- 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.

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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	-	-
MATH 102	Calculus II	3	3	-	MATH 101
CS 101	Introduction to Programming	3	3	-	CIS 100 or Concurrent
CS 102	Programming Lab	1	-	3	CS 101 or Concurrent
CS 112	Introduction to Object-Oriented Programming	3	3	-	CS 102
CS 211	Data Structures and Algorithms	3	3	-	CS 112
CIS 200	Professional & Ethical Issues in Computing	1	1	-	-
CIS 201	Introduction to Web Design	1	-	3	CS 112
CIS 228	Fundamentals of Database Systems	3	3	-	CS 211
SE 230	Fundamentals of Software Engineering	3	3	-	CS 211
CPE 231	Digital Logic Design	3	3	-	CS 112

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3. Department Requirements (108 CHs):

3-a) Department Mandatory Courses (93 CHs):

3-a1) Mandatory Courses from the Department of Mathematics (9 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
MATH 241	Discrete Mathematics	3	3	-	MATH 102
MATH 201	Intermediate Analysis	3	3	-	MATH 102
MATH 203	Ordinary Differential Equations	3	3	-	MATH 102

3-a2) Mandatory Courses from the Department of Chemistry (3 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
CHEM 103	General Chemistry	3	3	-	-

3-a3) Mandatory Courses from the Department of Applied Physics (6 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
PHY 101	General Physics I	3	3	-	-
PHY 102	General Physics II	3	3	-	PHY 101

3-a4) Mandatory Courses from the Department of Electrical Engineering (17 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
EE 212	Electrical Circuits (<i>For Non-EE Students</i>)	3	3	-	PHY 102, MATH 203 or Concurrent
EE 213	Electrical Circuits Lab	1	-	3	EE 212
EE 240	Introduction to Linear Systems	3	3	-	MATH 201+ PHY 102
EE 260	Signals and Systems Analysis	3	3	-	EE 212 + EE240 or Concurrent
EE 321	Electronics I (<i>For Non-EE Students</i>)	3	3	-	EE 212
EE 322	Electronic Circuits Lab	1	-	3	EE 213, EE 321
EE 440	Control Systems	3	3	-	EE 260

3-a5) Mandatory Courses from the Department of Mechanical Engineering (3 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
ME 215	Engineering Mechanics	3	3	-	PHY 101

3-a6) Mandatory Courses from the Department of Network Engineering and Security (13 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
NES 201	Communication Skills	3	3	0	-
NES 301	Probability and Queuing Theory	3	3	-	MATH 241
NES 311	Data Communication	3	3	-	CPE 231, EE 260 or Concurrent
NES 312	Fundamentals of Computer Networks	3	3	-	NES 311, NES 301
NES 413	Computer Networks Laboratory	1	-	3	NES 312, EE 322

3-a7) Mandatory Courses from the Department of Software Engineering (3 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
SE 440	Project Management	3	3	0	SE 230

3-a8) Mandatory Departmental Courses (39 CHs):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
CPE 252	Computer Organization and Design	3	3	0	CPE 231
CPE 233	Digital Logic Design Lab	1	0	3	CPE 252 (or concurrent)
CPE 311	Object-Oriented Software Analysis & Design	3	3	0	SE 230

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CPE 351	Microprocessor Systems	3	3	0	CPE 252
CPE 352	Computer Architecture	3	3	0	CPE 252
CPE 354	Microprocessor Systems Lab	1	0	3	CPE 233, CPE 351 or concurrent
CPE 420	Digital Integrated Circuits	3	3	0	EE 321, CPE 231
CPE 452	Microprocessor Interfacing Lab	2	1	3	CPE 354
CPE 433	Advanced Digital Systems Design	3	3	0	CPE 420, CPE352
CPE 470	Operating Systems	3	3	0	CPE 352
CPE 471	UNIX System Programming	3	3	0	CPE 470
CPE 480	Artificial Intelligence Systems	3	3	0	CPE 311, NES 301
CPE 390	Practical Training I	2	0	0	Completion of 90 CHs
CPE 490	Practical Training II	2	0	0	Completion of 110 CHs, CPE 390 or Concurrent
CPE 591	Graduation Project I	1	0	0	Completion of 120 CHs
CPE 592	Graduation Project II	3	0	0	CPE 591

3-b) Department Elective Courses (15 CHs): (*)

- Student must select **6 CHs** from table (3-b1).
- Student must select **6 CHs** from table (3-b2).
- Student must select **3 CHs** from table (3-b3).

Table (3-b1): Elective Courses from other departments in the faculty

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
SE 310	Visual Programming	3	3	0	CPE 311
SE 320	System Analysis and Design	3	3	0	CPE 311 + CIS 228
SE 411	Component-Based Software Development	3	3	0	SE 230
NES 411	Network Programming	3	3	0	CPE 470 + NES 312
NES 415	Networking Protocols	3	3	0	NES 312
NES 440	Wireless Networks	3	3	0	NES 413
NES 452	Cryptography and Network Security	3	3	0	NES 413
CS 472	Compiler Design	3	3	0	CPE 470 + CPE 352
CS 480	Computer Graphics	3	3	0	NES 301, EE 240
CIS 340	Web Application Development	3	2	3	CIS 201
CIS 429	Data Mining	3	3	0	CPE 480

Table (3-b2): Elective Courses (A)

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
CPE 510	Introduction to Parallel Algorithms & Programming	3	3	0	CPE 470
CPE 523	VLSI System Design	3	3	0	CPE 433
CPE 547	Reliability and Availability	3	3	0	CPE 470 + CPE 351
CPE 551	Advanced Computer Architecture	3	3	0	CPE 352
CPE 554	Embedded Systems	3	3	0	CPE 452 + CPE 470
CPE 560	Distributed Systems and Middleware	3	3	0	CPE 470
CPE 572	Real Time Systems	3	3	0	CPE 470 + CPE 452
CPE 581	Computer Vision	3	3	0	CPE 480
CPE 583	Robotics	3	3	0	CPE 452
CPE 584	Introduction to Neural & Fuzzy Computing	3	3	0	CPE 311 + NES 311
CPE 585	Introduction to Bioinformatics	3	3	0	CPE 480
CPE 593	Special Topics in Computer Engineering I	1	1	0	Department Approval
CPE 594	Special Topics in Computer Engineering II	2	2	0	Department Approval
CPE 595	Special Topics in Computer Engineering III	3	3	0	Department Approval
-	Courses from Electrical Engineering Department (400 level and above)	-	-	-	Department Approval

Table (3-b3): Elective Courses (B)

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
CPE 559	Computer Systems Project	3	3	0	SE 440 + CPE 470
CPE 579	Software Design & Development Project	3	3	0	SE 440

(*) 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.

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NOTE: The following table contains courses offered by the department of Computer Engineering for non-Computer Engineering students:-

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
CPE 234	Digital Logic Design and Computer Architecture <i>(for non CPE students)</i>	3	3	0	CIS 100
CPE 235	Digital Logic Design Lab <i>(for non CPE students)</i>	1	0	3	CPE 234 or CPE 252
CPE 353	Microprocessor Systems <i>(for non CPE students)</i>	3	3	0	CPE 234 or CPE 252

Course Numbering Convention:

Digit	Meaning	Explanation	
Hundreds	Course Level	1	First year
		2	Second year
		3	Third year
		4	Forth year
		5	Fifth year
Tens	Course Subject	0	General
		1	Programming
		2	Electronics
		3	Digital Systems
		4	Secure and Reliable Computing
		5	Architecture
		6	Networking
		7	Systems Programming
		8	Artificial Systems
9	Graduation projects, training, and special topics		
Ones	Course Sequence	Course sequence number within its subject area	

Recommended Study Plan

1st Year

Semester 1			
Course Number	Course Name	# CH	Prerequisite
MATH 101	Calculus I	3	-
CS 101	Introduction to Programming	3	CIS 100 or Concurrent
CS 102	Programming Lab	1	CS 101 or Concurrent
PHY 101	General Physics I	3	-
ENG 111	English Language I	3	Pass ENG 099
CIS 100	Computer Skills	3	-
Total		16	

Semester 2			
Course Number	Course Name	# CH	Prerequisite
MATH 102	Calculus II	3	MATH 101
ARB 101	Arabic Language	3	-
CS 112	Introduction to Object-Oriented Programming	3	CS 102
PHY 102	General Physics II	3	PHY 101
CHEM 103	General Chemistry	3	-
ENG 112	English Language II	3	ENG 111
Total		18	

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2nd Year

Semester 1			
Course Number	Course Name	# CH	Prerequisite
MATH 201	Intermediate Analysis	3	MATH 102
MATH 203	Ordinary Differential Equations	3	MATH 102
CS 211	Data Structures & Algorithms	3	CS 112
CPE 231	Digital Logic Design	3	CS 112
NES 201	Communication Skills	3	-
CIS 201	Introduction to Web Design	1	CS 112
CIS 200	Professional & Ethical Issues in Computing	1	-
Total		17	

Semester 2			
Course Number	Course Name	# CH	Prerequisite
MATH 241	Discrete Mathematics	3	MATH 102
HSS 100	Culture and University Behavior	1	-
SE 230	Fundamentals of Software Engineering	3	CS 211
EE 212	Electrical Circuits (For Non-EE Students)	3	PHY 102, MATH 203 or Concurrent
CPE 252	Computer Organization and Design	3	CPE 231
CPE 233	Digital Logic Design Lab	1	CPE 252 (or concurrent)
CIS 228	Fundamentals of Database Systems	3	CS 211
Total		17	

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3rd Year

Semester 1			
Course Number	Course Name	# CH	Prerequisite
EE 213	Electrical Circuits Lab	1	EE 212
EE 240	Introduction to Linear Systems	3	MATH 201 + PHY 102
EE 260	Signals and Systems Analysis	3	EE 212 + EE 240 or Concurrent
NES 301	Probability and Queuing Theory	3	MATH 241
NES 311	Data Communication	3	CPE 231, EE 260 or Concurrent
CPE 311	Object-Oriented Software Analysis & Design	3	SE 230
Total		16	

Semester 2			
Course Number	Course Name	# CH	Prerequisite
EE 321	Electronics I (For Non-EE Students)	3	EE 212
ME 215	Engineering Mechanics	3	PHY 101
NES 312	Fundamentals of Computer Networks	3	NES 311, NES 301
CPE 351	Microprocessor Systems	3	CPE 252
CPE 352	Computer Architecture	3	CPE 252
CPE 354	Microprocessor Systems Lab	1	CPE 233, CPE 351 or concurrent
Total		16	

Semester 3 (Summer)			
Course Number	Course Name	# CH	Prerequisite
CPE 390	Practical Training 1	2	Completion of 90 CHs
Total		2	

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4th Year

Semester 1			
Course Number	Course Name	# CH	Prerequisite
EE 322	Electronic Circuits Lab	1	EE 213, EE 321
MS 100	Military Science	3	-
SE 440	Project Management	3	SE 230
CPE 420	Digital Integrated Circuits	3	EE 321, CPE 231
CPE 452	Microprocessor Interfacing Lab	2	CPE 354
CPE 470	Operating Systems	3	CPE 352
Total		15	

Semester 2			
Course Number	Course Name	# CH	Prerequisite
EE 440	Control Systems	3	EE 260
NES 413	Computer Networks Lab	1	NES 312, EE 322
CPE 433	Advanced Digital Systems Design	3	CPE 420, CPE352
CPE 471	UNIX System Programming	3	CPE 470
CPE 480	Artificial Intelligence Systems	3	CPE 311, NES 301
-	University Elective	3	-
Total		16	

Semester 3 (Summer)			
Course Number	Course Name	# CH	Prerequisite
CPE 490	Practical Training "2 "	2	Completion of 110 CHs, CPE 390 or Concurrent
Total		2	

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5th Year

Semester 1			
Course Number	Course Name	# CH	Prerequisite
CPE 591(*)	Graduation Project I	1	Completion of 120 CHs
-	Department Elective	3	-
-	Department Elective	3	-
-	Department Elective	3	-
-	University Elective	3	-
Total		13	

Semester 2			
Course Number	Course Name	# CH	Prerequisite
CPE 592	Graduation Project II	3	CPE 591
-	Department Elective	3	-
-	Department Elective	3	-
-	University Elective	3	-
Total		12	

(*) Students must register "CPE 591" before the graduation semester (Semester 1 or Semester 2).