COMSATS Institute of Information Technology
Registrar Office, Principal Seat, Islamabad

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No: CIIT-Reg/Notif-866 /12/1272 **August 10, 2012**

NOTIFICATION

Scheme of Studies of Bachelor of Science (BS) in Computer Engineering, BS(CE) (General Version)

It is hereby notified that the Academic Council in its 13th Meeting held on June 04, 2012 approved the following scheme of studies of Bachelor of Science (BS) in Computer Engineering, BS(CE) (General Version) with effect from Fall 2012 at CIIT system:

The launching of the program is subject to approval from Pakistan Engineering Council.

i.	Minimum Duration:	04 Years
ii.	Minimum No of Semesters	08
iii.	No of Credit Hours in each Semester:	13-19
iv.	**Core Courses:**	
	a. Engineering Courses (List Attached)	21
	b. Non-Engineering Courses (List Attached)	12
v.	**Elective Courses:**	
	c. Major Electives (I-IV)*	4
	d. Major Elective V or EE Open Elective I or IDEE I (Optional) ***	1
	e. Major Elective VI or EE Open Elective II or IDEE II (Optional) ***	1
vi.	Total No of Courses:	**39**
vii.	Total No of Credit Hours:	**134-140 Cr Hours.**

Note:
The Regulations relating to Undergraduate Degree Programs approved by the Competent Authority and amended from time to time shall also be applicable to this program.

This issues with the approval of the Competent Authority.

Nadeem Uddin Qureshi
Additional Registrar

Encl: Brief Introduction, Course Distribution, Tentative Plan of Studies, Course Hierarchy.

Distribution:

1. Dean, Faculty of Engineering, CIIT
2. Dean of Research, Innovation and Commercialization (DORIC), CIIT
3. All Directors, CIIT System.
4. Incharge, CIIT Islamabad Campus.
5. Chairman, Department of Electrical Engineering, CIIT
6. All Incharges, Academic Sections, CIIT Campuses
7. All HoD's/Incharges, Department of Electrical Engineering, CIIT Campuses
8. Controller of Examinations, CIIT
9. All Incharges, Examination Departments, CIIT Campuses.

CC:

1. PS to Rector
2. PA to Registrar

Core Courses

List of Engineering Courses

Sr. No	Course Code	Course Title	Credits Hours"	Prerequisite(s)†
1	CSC112	Algorithms and Data Structures	4(3, 1)	CSC141
2	CSC141	Introduction to Computer Programming	4(3, 1)	
3	CSC241	Object Oriented Programming	4(3, 1)	CSC141
4	CSC271	Database Systems	4(3, 1)	CSC112
5	CSC322	Operating Systems Concepts	3(3, 0)	CSC112
6	EEE121	Electric Circuits Analysis I	4(3, 1)	
7	EEE214	Computer Applications in Engineering	4(3, 1)	CSC141
8	EEE222	Electric Circuits Analysis II	4(3, 1)	EEE121
9	EEE223	Signals and Systems	4(3, 1)	MTH104
10	EEE231	Electronics I	4(3, 1)	EEE121, PHY121
11	EEE232	Electronics II	4(3, 1)	EEE231
12	EEE241	Digital Logic Design	4(3, 1)	
13	EEE251	Probability Methods in Engineering	3(3, 0)	MTH104, MTH231
14	EEE314	Data Communication and Computer Networks	4(3, 1)	
15	EEE324	Digital Signal Processing	4(3, 1)	EEE223
16	EEE342	Microprocessor Systems and Interfacing	4(3, 1)	EEE343
17	EEE343	Computer Organization	3(3, 0)	EEE241
18	EEE351	Principles of Communication Systems	4(3, 1)	EEE223

19	EEE440	Computer Architecture	4(3, 1)	EEE343
20	EEE490	Final Year Project (Part I)**	1(0, 1)	
21	EEE490	Final Year Project (Part II)**	5(0, 5)	

List of Non-Engineering Courses

Sr. No	Course Code	Course Title	Credits Hours‼	Prerequisite(s)†
1	ECO300	Engineering Economics	3(3, 0)	
2	HUM100	English Comprehension and Composition	3(3, 0)	
3	HUM102	Report Writing Skills	3(3, 0)	HUM100
4	HUM110	Islamic Studies	3(3, 0)	
5	HUM111	Pakistan Studies	3(3, 0)	
6	MGT462	Project Planning and Management	3(3, 0)	
7	MTH104	Calculus and Analytical Geometry	3(3, 0)	
8	MTH105	Multivariable Calculus	3(3, 0)	MTH104
9	MTH231	Linear Algebra	3(3, 0)	
10	MTH241	Ordinary Differential Equations	3(3, 0)	MTH104
11	MTH375	Numerical Computations	3(2, 1)	MTH104, CSC141
12	PHY121	Applied Physics for Engineers	4(3, 1)	

***Major Elective Courses**

Sr No	Course Code	Course Title	Credits Hours‼	Prerequisite(s)†
1	CSC334	Distributed Computing	4(3, 1)	EEE440, CSC322
2	CSC336	Web Engineering	4(3, 1)	CSC141
3	CSC341	Network Programming	4(3, 1)	EEE314,CSC141
4	CSC421	Systems Programming	4(3, 1)	EEE342, CSC322
5	CSC443	Scripting Languages	3(3, 0)	CSC336
6	CSC451	Multimedia and Hypermedia System	3(3, 0)	CSC253
7	CSC452	Virtual Reality	3(3, 0)	CSC253
8	CSC454	Computer Animations	3(3, 0)	CSC253
9	CSC455	Computer Vision	3(3, 0)	CSC253
10	CSC492	Software Engineering	3(3, 0)	CSC112
11	EEE253	Computer Graphics	4(3, 1)	CSC141
12	EEE325	Control Systems	4(3, 1)	EEE222

13	EEE344	Digital System Design	4(3, 1)	EEE241
14	EEE353	Digital Communication Systems	4(3, 1)	EEE351 or EEE352
15	EEE354	Telecommunication Systems Engineering	3(3, 0)	EEE351 or EEE352
16	EEE415	Digital Image Processing	4(3, 1)	MTH231, EEE223
17	EEE434	VLSI Design	4(3, 1)	EEE241, EEE232
18	EEE446	Real Time Embedded Systems	4(3, 1)	EEE342
19	EEE455	Optical Fiber Communications	3(3, 0)	EEE351 or EEE352
20	EEE456	Broadband Technologies	3(3, 0)	EEE314
21	EEE461	Neural Networks	3(3, 0)	EEE461
22	EEE462	Artificial Intelligence	3(3, 0)	CSC112
23	EEE464	Wireless Communication Systems	3(3, 0)	EEE351 or EEE352
24	EEE471	Fault Tolerant Computing	3(3, 0)	EEE440, CSC112

!! 03 credit hours of theory is equivalent to 03 hours of lectures whereas 01 credit hour of lab is equivalent to 03 hours of lab session. All the lab sessions are graded. Students have to pass both theory and lab to earn the course credits.

† Courses with prerequisites can only be allowed if all prerequisite courses have been passed.

* With the consent of Academic Advisor and Department the student has to select courses from the list of elective courses.

** Students must clear all the engineering subjects in the first five semesters, as given in the tentative plan, to be eligible for the Final year project.

*** With the consent of Academic Advisor and Department the student can take any approved course of EE which he/she has not taken before according to his/her aptitude and/or future plans. The student has the flexibility of selecting between Major Elective V, VI and EE Open Electives, and Inter Disciplinary Electives from the list of elective courses.

Note:

The list of Electives may be revised from time to time and will be offered by the department subject to the availability of the faculty.

Bachelor of Science in Computer Engineering

Introduction

Computer Engineering is an enormously vibrant area of study. It focuses on the design, analysis and application of the computer system. It is a practical field intended to solve real world problems by combining ideas from engineering with basic science. The curriculum of Bachelor of Science in Computer Engineering is developed in such a way that during the first year, reinforcement in science and mathematic subjects are provided. During the second year, graduates will be reinforced with the Electronic Engineering and Computer Engineering fields. In the third and fourth year, major emphasis is on Computer Architecture and Interfacing, Digital Systems and Computer Science.

Program Objectives:

The objective of this program is:

- To equip students with the sound knowledge of Computer Engineering
- To produce well-trained, skilled and efficient professional engineers
- To develop their communication skills
- To develop their analysis, synthesis and design skills
- To prepare graduates who are capable of entering and succeeding in an advanced degree program in their field of study
- To create an excellent environment for research and development activities

Program Outcomes:

The graduates of the program will be able to:

- Possess essential engineering knowledge for meeting the requirements of industries and other organizations needing graduate engineers
- Do planning, specification, design, implementation, and operation of systems
- Apply engineering knowledge, mathematical tools and probabilistic/statistical methods to solve technical problems

Course Distribution

Domain	Knowledge Area	Total Courses	Total Credits	Overall %age
Non-Engineering	Humanities	4	12	30.68%
	Management Sciences	2	6	
	Natural Sciences	6	19	
	Sub Total	**12**	**37**	
Engineering	Computing	2	8	69.15%
	Engineering Foundation	9	34	
	Major Engg. Core (Breadth)	6	23	
	Major Engg. Core (Depth)	6-8	20-24 to 26-32	
	Minor Engg. Courses	1-2	3-4 to 6-8	
	Inter-Disciplinary Electives	1-2	3-4 to 6-8	
	Final Year Project	2	6	
	Sub Total	**27**	**97- 103**	
Grand Total		**39**	**134-140**	100%

Courses of Non-Engineering Domain

Knowledge Area	Course Title	Credit Hrs.	Total Courses	Total Credit Hrs.	%age
Humanities	English Comprehension and Composition	3(3, 0)	4	12	10.2 %
	Report Writing Skills	3(3, 0)			
	Islamic Studies	3(3, 0)			
	Pakistan Studies	3(3, 0)			
Management Sciences	Engineering Economics	3(3, 0)	2	6	5.1%
	Project Planning and Management	3(3, 0)			

Natural Sciences	Applied Physics for Engineers	4(3, 1)	6	19	**15.38 %**
	Calculus and Analytical Geometry	3(3, 0)			
	Linear Algebra	3(3, 0)			
	Multivariable Calculus	3(3, 0)			
	Ordinary Differential Equations	3(3, 0)			
	Numerical Computations	3(2, 1)			
	Total		**12**	**37**	**30.68 %**

Courses of Engineering Domain

Knowledge Area	Course Title	Credit Hrs.	Total Courses	Total Credit Hrs.	%age
Computing	Introduction to Computer Programming	4(3, 1)	2	8	**5.1%**
	Computer Applications in Engineering	4(3, 1)			
Engineering Foundation	Algorithms and Data Structures	4(3, 1)	9	34	**23.07 %**
	Signals and Systems	4(3, 1)			
	Digital Logic Design	4(3, 1)			
	Electric Circuits Analysis I	4(3, 1)			
	Electric Circuits Analysis II	4(3, 1)			
	Electronics I	4(3, 1)			
	Electronics II	4(3, 1)			
	Probability Methods in Engineering	3(3, 0)			
	Computer Organization	3(3, 0)			
Major Engineering Core Courses (Breadth)	Data Communication and Computer Networks	4(3, 1)	6	23	**15.38 %**
	Principles of Communication Systems	4(3, 1)			
	Object Oriented Programming	4(3, 1)			

	Operating Systems Concepts	3(3, 0)			
	Database Systems	4(3, 1)			
	Microprocessor Systems and Interfacing	4(3, 1)			
Major Engineering Core Courses (Depth)	Digital Signal Processing	4(3, 1)	6-8	20-24 to 26-32	**15.38 %**
	Computer Architecture	4(3, 1)			
	Major Elective I	3(3, 0) / 4(3, 1)			
	Major Elective II	3(3, 0) / 4(3, 1)			
	Major Elective III	3(3, 0) / 4(3, 1)			
	Major Elective IV	3(3, 0) / 4(3, 1)			
	Major Elective V (optional)*	3(3, 0) / 4(3, 1)			
	Major Elective VI (optional)*	3(3, 0) / 4(3, 1)			
Minor Engineering Courses	EE Open I (optional)*	3(3, 0) / 4(3, 1)	1-2	3-4 to 6-8	**2.56%**
	EE Open II (optional)*	3(3, 0) / 4(3, 1)			
Inter-Disciplinary Course	IDEE I (optional)*	3(3, 0) / 4(3, 1)	1-2	3-4 to 6-8	**2.56%**
	IDEE II (optional)*	3(3, 0) / 4(3, 1)			
Final Year Design Project	Final Year Project (Part I)	1(0, 1)	2	6	**5.1%**
	Final Year Project (Part II)	5(0, 5)			
	Total		**27**	**97-103**	**69.15 %**

* The student has the flexibility of selecting between Major Elective, Inter-Disciplinary Elective and Minor Electives.

Tentative Plan of Studies

The course offering in each semester as given below is not fixed; it may vary depending on the availability of faculty and needs of the students.

Semester – 1

Course Code	Course Title	Credits Hours‼	Prerequisite(s)†
MTH104	Calculus and Analytical Geometry	3(3, 0)	
MTH231	Linear Algebra	3(3, 0)	
CSC141	Introduction to Computer Programming	4(3, 1)	
PHY121	Applied Physics for Engineers	4(3, 1)	
HUM100	English Comprehension and Composition	3(3, 0)	
	Total	**17(15, 2)**	

Semester – 2

Course Code	Course Title	Credits Hours‼	Prerequisite(s)†
MTH105	Multivariable Calculus	3(3, 0)	MTH104
MTH241	Ordinary Differential Equations	3(3, 0)	MTH104
EEE241	Digital Logic Design	4(3, 1)	
EEE121	Electric Circuits Analysis I	4(3, 1)	
CSC112	Algorithms and Data Structures	4(3, 1)	CSC141
	Total	**18(15, 3)**	

Semester – 3

Course Code	Course Title	Credits Hours‼	Prerequisite(s)†
EEE214	Computer Applications in Engineering	4(3, 1)	CSC141
EEE222	Electric Circuits Analysis II	4(3, 1)	EEE121
EEE231	Electronics I	4(3, 1)	EEE121, PHY121
EEE343	Computer Organization	3(3, 0)	EEE241
CSC241	Object Oriented Programming	4(3, 1)	CSC141
	Total	19(15, 4)	

Semester – 4

Course Code	Course Title	Credits Hours‼	Prerequisite(s)†
EEE251	Probability Methods in Engineering	3(3, 0)	MTH104, MTH231
EEE223	Signals and Systems	4(3, 1)	MTH104
EEE232	Electronics II	4(3, 1)	EEE231
EEE342	Microprocessor Systems and Interfacing	4(3, 1)	EEE343
CSC322	Operating Systems Concepts	3(3, 0)	CSC112
	Total	**18(15, 3)**	

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Semester – 5

Course Code	Course Title	Credits Hours‼	Prerequisite(s)†
MTH375	Numerical Computations	3(2, 1)	MTH104, CSC141
EEE314	Data Communication and Computer Networks	4(3, 1)	
	Major Elective I *(Operating Systems Concepts for DDP)*	3(3, 0)/4(3, 1)	
CSC271	Database Systems	4(3, 1)	CSC112
EEE440	Computer Architecture	4(3, 1)	EEE343
	Total	**18-19(14, 5)**	

Semester – 6

Course Code	Course Title	Credits Hours‼	Prerequisite(s)†
ECO300	Engineering Economics	3(3, 0)	
EEE351	Principles of Communication Systems	4(3, 1)	EEE223
EEE324	Digital Signal Processing	4(3, 1)	EEE223
	Major Elective II *(Digital System Design for DDP)*	3(3, 0)/4(3, 1)	
	Major Elective III *(Microprocessor Systems and Interfacing for DDP)*	3(3, 0)/4(3, 1)	
	Total	**17-19(15,2-4)**	

Semester – 7

Course Code	Course Title	Credits Hours‼	Prerequisite(s)†
HUM102	Report Writing Skills	3(3, 0)	HUM100
EEE490	Final Year Project (Part I)	1(0, 1)	
HUM110	Islamic Studies	3(3, 0)	
	Major Elective IV *(Wireless Communication Systems for DDP)*	3(3, 0)/4(3, 1)	
	Major Elective V / IDEE I/ EE Open I *(Control Systems for DDP)*	3(3, 0)/4(3, 1)	
	Total	**13-15(12,1-3)**	

Semester – 8

Course Code	Course Title	Credits Hours‼	Prerequisite(s)†
MGT462	Project Planning and Management	3(3, 0)	
EEE490	Final Year Project (Part II)	5(0, 5)	
HUM111	Pakistan Studies	3(3, 0)	
	Major Elective VI/ IDEE II/ CE Open II	3(3, 0)/4(3, 1)	
	Total	**14-15(9,5-6)**	

Total Credit Hours = 134 – 140

Course Hierarchy