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

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No: CIIT-Reg/Notif- 728 /12/ 1053 July 04, 2012

NOTIFICATION

Scheme of Studies of Bachelor of Science (BS) in
Chemical Engineering, BS(ChE)

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 Chemical Engineering, BS(ChE) with effect from Fall 2012 at CIIT Lahore Campus only:

i.	Minimum Duration:	04 Years
ii.	Minimum No. of Semesters:	08
iii.	No. of Credit Hours in each Semester:	15-19
iv.	Main Courses (including Labs):	
	a. Engineering Courses (List Attached)	30
	b. Non Engineering Courses (List Attached)	15
v.	Elective courses (List Attached)	27
vi.	Total No. of Main Courses:	45
vii.	Total No of Credit Hours	138

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. Director, Lahore Campus, CIIT.
3. Chairman, Department of Chemical Engineering, CIIT
4. Incharge, Academics, CIIT Lahore Campus.
5. HoD, Department of Chemical Engineering, CIIT Lahore Campus.
6. Controller of Examinations, CIIT.
7. Incharge, Examination Departments, CIIT Lahore Campus.

CC:

1. PS to Rector
2. PA to Registrar

List of Courses:

List of Engineering Courses:

Serial No.	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1	CSC101	Introduction to Computing	3(2, 1)	
2	CSC141	Introduction to Computer Programming	4(3, 1)	CSC101
3	CHE110	Chemical Process Principles I	3(3, 0)	
4	EEE113	Engineering Drawing	1(0, 1)	
5	CHE120	Thermodynamics I for Chemical Engineers	3(3, 0)	
6	MEE111	Workshop Practice	2(0, 2)	
7	CHE211	Chemical Process Principles II	3(3, 0)	CHE110
8	CHE230	Fluid Mechanics for Chemical Engineers	4(3, 1)	PHY132
9	CHE212	Transport Phenomena	3(3, 0)	MTH242
10	CHE213	Particulate Technology	4(3, 1)	CHE230
11	CHE221	Chemical Process Technology I	3(3, 0)	
12	CHE322	Fuels and Combustion	4(3, 1)	
13	CHE331	Mass Transfer Operations	3(3, 0)	
14	CHE332	Heat Transfer Operations	3(3, 0)	
15	CHE323	Thermodynamics II for Chemical Engineers	4(3, 1)	CHE120
16	CHE340	Engineering Materials	3(3, 0)	
17	CHE324	Chemical Reaction Engineering	4(3, 1)	CHE322
18	CHE333	Simultaneous Heat and Mass Transfer Operations	3(3, 0)	CHE212
19	CHE334	Instrumentation and Process Control	4(3, 1)	MTH242
20	CHE335	Mass Transfer Operations Lab	1(0, 1)	
21	CHE336	Heat Transfer Operations Lab	1(0, 1)	
22	CHE425	Chemical Process Technology II	4(3, 1)	CHE221
23	CHE438	Simultaneous Heat and Mass Transfer Operations Lab	1(0, 1)	
24	CHE439	Petroleum Refinery Engineering	3(3, 0)	
25	CHE441	Chemical Engineering Plant Design	3(3, 0)	
26	CHE442	Chemical Engineering Plant Design Project	5(0, 5)	
27	CHE443	Maintenance Engineering and Safety	2(2, 0)	
28		Elective I*	3(3, 0)	
29		Elective II*	3(3, 0)	
30	CHE337	Industrial Training (4-6 weeks)	5(0, 5)	

List of Non-Engineering Courses:

Serial No.	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1	CHM100	Chemistry I		
2	CHM201	Chemistry II	4(3, 1)	CHM100
3	ECO300	Engineering Economics	2(2, 0)	
4	HUM100	English Comprehension and Composition	3(3, 0)	
5	HUM102	Report Writing Skills	3(3, 0)	HUM100
6	HUM103	Communication Skills	3(3, 0)	HUM100
7	HUM110	Islamic Studies	3(3, 0)	
8	HUM111	Pakistan Studies	3(3, 0)	
9	MGT362	Production and Operation Management	3(3, 0)	
10	MGT462	Project Planning and Management	2(2, 0)	
11	MTH101	Calculus I	3(3, 0)	
12	MTH102	Calculus II	3(3, 0)	MTH101
13	MTH242	Differential Equations	3(3, 0)	MTH102
14	MTH375	Numerical Computations	3(2, 1)	MTH102
15	PHY132	Physics for Chemical Engineers	4(3, 1)	

List of Elective Courses:

Serial No.	Course Code	Course Title	Credit Hours	Pre-requisite(s)
1.	CHE415	Oil and Gas Production and Processing	3(3, 0)	
2.	CHE416	Petrochemical Engineering	3(3, 0)	
3.	CHE417	Corrosion Engineering	3(3, 0)	
4.	CHE418	Gas Processing	3(3, 0)	
5.	CHE426	Colorants and Auxiliaries	3(3, 0)	
6.	CHE427	Fibrous Materials processing	3(3, 0)	
7.	CHE428	Advanced Coloring Engineering	3(3, 0)	
8.	CHE429	Textile Processing	3(3, 0)	
9.	CHE446	Chemical Process Design and Simulations	3(3, 0)	
10.	CHE450	Polymer and Rubber Technology	3(3, 0)	
11.	CHE451	Polymer Engineering	3(3, 0)	
12.	CHE461	Biochemical Engineering	3(3, 0)	
13.	CHE462	Biochemical Separations	3(3, 0)	
14.	CHE463	Biochemical Process and Products	3(3, 0)	
15.	CHE470	Coal Combustion Technology	3(3, 0)	
16.	CHE471	Renewable Energy Resources	3(3, 0)	
17.	CHE472	Industrial Energy Systems	3(3, 0)	
18.	CHE480	Risk Management and Safety	3(3, 0)	
19.	CHE481	Environmental Engineering	3(3, 0)	
20.	CHE482	Waste Management	3(3, 0)	
21.	CHE483	Fundamentals of Environmental Processes	3(3, 0)	
22.	CHE490	Nuclear Engineering	3(3, 0)	
23.	CHE491	Novel Separation Processes	3(3, 0)	
24.	CHE492	Mineral Processing Technology	3(3, 0)	
25.	CHE493	Electronic and Liquid Crystalline Materials	3(3, 0)	
26.	CHE494	Fuel Cell Technology	3(3, 0)	
27.	CHE495	Composite Materials	3(3, 0)	

Note:

- 3 credit hours of theory is equivalent to 3 hours of lectures whereas 1 credit hour of lab is equivalent to 3 hours of lab session. All the lab sessions are graded. Students have to pass both theory and lab to earn the module credits.
- Modules with prerequisites can only be allowed if all prerequisite modules have been passed.

* Elective course/modules will be offered subject to the availability of Faculty members and laboratory facilities.

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING

Introduction

The Dual BS (Chemical Engineering) degree is a four year degree programme, which provides coverage of a wide range of technical modules related to chemical engineering. Its overall aim is to enable students to understand, engage with, and form a reflective perspective on the roles and practices of chemical engineering in industries; to enable them to acquire appropriate levels of knowledge of technical decision-making perspectives. Students also obtain a basic knowledge across a spectrum of key functional areas. Furthermore the programme also enables students to develop a reflective outlook on issues relating to their potential future employability and career development, and future learning development, in academia and industries. The scheme provides high expected returns in terms of professional and vocational relevance.

Program Objectives:

The objectives of this program are:

1. To provide students with a solid theoretical and practical knowledge of the design, maintenance and operation of chemical plants.
2. To develop students' critical analysis power of and reflection upon chemical plant issues and their ability to analyse phenomena effectively and resolve the problem efficiently.
3. To prepare students for a career in academia or chemical engineering related fields and develop their capability to contribute to society at large.
4. To enhance students' lifelong learning skills, communication skills and personal development.
5. To develop students' adaptability and flexibility of approach.

Program Outcomes:

The graduates of the program will be able to:

1. Develop concepts and techniques for academic research in chemical engineering related research areas.
2. Develop different processing techniques whereby bringing innovations to the existing systems.
3. Plan, structure and conduct individual or group projects effectively.
4. Develop interpersonal skills of effective listening, persuasion and presentation.
5. Develop, analyze, and design different industrial equipments using the developed concepts and techniques.

Course Distribution

Domain	Knowledge Area	Total Courses	Total Credits	Overall %age
Non-Engineering	Humanities	5	15	33%
	Management Sciences	3	7	
	Natural Sciences	7	24	
	Sub Total	**15**	**46**	
Engineering	Computing	2	7	67%
	Engineering Foundation	6	16	
	Major Engg Core (Breadth)	9	30	
	Major Engg Core (Depth)	11	29	
	Summer Industrial Training	1	5	
	Final Year Project	1	5	
	Sub Total	**30**	**92**	
Grand Total		**45**	**138**	**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)	5	15	11%
	Report Writing Skills	3(3, 0)			
	Islamic Studies	3(3, 0)			
	Pakistan Studies	3(3, 0)			
	Communication Skills	3(3, 0)			
Management Sciences	Production and Operations Management	3(3, 0)	3	7	5%
	Project Planning and Management	2(2, 0)			
	Engineering Economics	2(2, 0)			
Natural Sciences	Physics for Chemical Engineers	4(3, 1)	7	24	17 %
	Calculus I	3(3, 0)			
	Calculus II	3(3, 0)			
	Chemistry I	4(3, 1)			
	Chemistry II	4(3, 1)			
	Differential Equations	3(3, 0)			
	Numerical Computations	3(2, 1)			
	Total		**15**	**46**	**33%**

Approved.

Courses of Engineering Domain

Knowledge Area	Course Title	Credit Hrs.	Total Courses	Total Credit Hrs.	%age
Computing	Introduction to Computing	3(2, 1)	2	7	5%
	Introduction to Computer Programming	4(3, 1)			
Engineering Foundation	Chemical Process Principles I	3(3, 0)	6	16	12%
	Engineering Drawing	1(0, 1)			
	Thermodynamics I for Chemical Engineers	3(3, 0)			
	Workshop Practice	2(0, 2)			
	Chemical Process Principles II	3(3, 0)			
	Particulate Technology	4(3, 1)			
Major Engineering Core Courses (Breadth)	Fluid Mechanics for Chemical Engineers	4(3, 1)	9	30	22%
	Transport Phenomena	3(3, 0)			
	Chemical Process Technology I	3(3, 0)			
	Chemical Process Technology II	4(3, 1)			
	Fuels and Combustion	4(3, 1)			
	Engineering Materials	3(3, 0)			
	Instrumentation and Process Control	4(3, 1)			
	Elective I*	3(3, 0)			
	Maintenance Engineering and Safety	2(2, 0)			
Major Engineering Core Courses (Depth)	Mass Transfer Operations	3(3, 0)	11	29	21%
	Heat transfer Operations	3(3, 0)			
	Thermodynamics II for Chemical Engineers	4(3, 1)			
	Chemical Reaction Engineering	4(3, 1)			
	Simultaneous Heat and Mass Transfer Operations	3(3, 0)			
	Petroleum Refinery Engineering	3(3, 0)			
	Chemical Engineering Plant Design	3(3, 0)			
	Elective II*	3(3, 0)			
	Mass Transfer Operations Lab	1(0, 1)			
	Heat transfer Operations Lab	1(0, 1)			
	Simultaneous Heat and Mass Transfer Operations Lab	1(0, 1)			
Summer Training	Industrial Training	5(0, 5)	1	5	3.5%
Design Project	Final Year Project (Part I)	5(0, 5)	1	5	3.5%
	Total		**30**	**92**	**67%**

* The student has the flexibility of selecting between 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.

1st Semester

Course Code	Course Title	Cr. Hrs.	Pre-Requisite(s)
CHE110	Chemical Process Principles I	3(3, 0)	
PHY132	Physics for Chemical Engineers	4(3, 1)	
MTH101	Calculus I	3(3, 0)	
HUM100	English Comprehension and Composition	3(3, 0)	
HUM110	Islamic Studies	3(3, 0)	
EEE113	Engineering Drawing	1(0, 1)	
		17(15, 2)	

2nd Semester

Course Code	Course Title	Cr. Hrs.	Pre-Requisite(s)
CHM100	Chemistry I	4(3, 1)	
HUM111	Pakistan Studies	3(3, 0)	
MTH102	Calculus II	3(3, 0)	MTH101
CSC101	Introduction to Computing	3(2, 1)	
HUM102	Report Writing Skills	3(3, 0)	HUM100
CHE120	Thermodynamics I for Chemical Engineers	3(3, 0)	
		19(17, 2)	

3rd Semester

Course Code	Course Title	Cr. Hrs.	Pre-Requisite(s)
MEE111	Workshop Practice	2(0, 2)	
CHM201	Chemistry II	4(3, 1)	CHM100
CHE211	Chemical Process Principles II	3(3, 0)	CHE110
MTH242	Differential Equations	3(3, 0)	MTH102
CHE230	Fluid Mechanics for Chemical Engineers	4(3, 1)	PHY132
		16(12, 4)	

4th Semester

Course Code	Course Title	Cr. Hrs.	Pre-Requisite(s)
CSC141	Introduction To Computer Programming	4(3, 1)	CSC101
CHE212	Transport Phenomena	3(3, 0)	MTH242
HUM103	Communication Skills	3(3, 0)	HUM100
CHE213	Particulate Technology	4(3, 1)	CHE230
CHE221	Chemical Process Technology I	3(3, 0)	
		17(15, 2)	

5th Semester

Course Code	Course Title	Cr. Hrs.	Pre-Requisite(s)
CHE322	Fuels and Combustion	4(3, 1)	
CHE331	Mass Transfer Operations	3(3, 0)	
CHE332	Heat Transfer Operations	3(3, 0)	
CHE323	Thermodynamics II for Chemical Engineers	4(3, 1)	CHE120
MTH375	Numerical Computations	3(2, 1)	MTH102
		17(14, 3)	

6th Semester

Course Code	Course Title	Cr. Hrs.	Pre-Requisite(s)
CHE340	Engineering Materials	3(3, 0)	
CHE324	Chemical Reaction Engineering	4(3, 1)	CHE322
CHE333	Simultaneous Heat and Mass Transfer Operations	3(3, 0)	CHE212
CHE334	Instrumentation and Process Control	4(3, 1)	MTH242
CHE335	Mass Transfer Operations Lab	1(0, 1)	
CHE336	Heat Transfer Operations Lab	1(0, 1)	
		16(12, 4)	

Summer

Course Code	Course Title	Cr. Hrs.	Pre-Requisite(s)
CHE337	Industrial Training (4-6 Weeks)	**5(0, 5)**	

7th Semester

Course Code	Course Title	Cr. Hrs.	Pre-Requisite(s)
CHE425	Chemical Process Technology II	4(3, 1)	CHE221
ECO300	Engineering Economics	2(2, 0)	
CHE438	Simultaneous Heat and Mass Transfer Operations Lab	1(0, 1)	
	Elective I	3(3, 0)	
CHE439	Petroleum Refinery Engineering	3(3, 0)	
CHE441	Chemical Engineering Plant Design	3(3, 0)	
		16(14, 2)	

8th Semester

Course Code	Course Title	Cr. Hrs.	Pre-Requisite(s)
MGT462	Project Planning and Management	2(2, 0)	
	Elective II	3(3, 0)	
CHE442	Chemical Engineering Plant Design Project	5(0, 5)	
MGT362	Production and Operation Management	3(3, 0)	
CHE443	Maintenance Engineering and Safety	2(2, 0)	
		15(10, 5)	

Total Credit Hours for the Degree = 138

Course Hierarchy