

~~SP17~~ SP17 *enrolled* Lahore Campus.
F16 to enrolled.

COMSATS Institute of Information Technology
Registrar Office Principal Seat, Islamabad

No: CIIT-Reg/Notif-322/16/350

January 20, 2016

NOTIFICATION
BS(CS) ABET

The Academic Council in its 24th meeting held on December 01, 2015 approved the Scheme of Studies of Bachelor of Science in Computer Science, effective from Fall 2016 for CIIT Islamabad Campus only:

1. Nomenclature of the Program: Bachelor of Science in Computer Science

2. Minimum Duration

- i. No. of Years: 04
- ii. No. of Semesters: 08

3. Course Work

	Min No. of Courses	Min No. of Credit Hours
4. Core Courses (List Attached):		
4.1 Computing Core Courses	12	41
4.2 Computing Supporting Areas Courses	4	13
4.3 Computing General Education Courses	7	21
4.4 Computer Science Core Courses	7	21
4.5 Computer Science Supporting Areas Courses	3	9
5. Elective Courses (List Attached)		
5.1 Computer Science Elective Courses	5	15
5.2 Institutional Elective Courses	2	6
5.3 Sciences Elective Courses	2	8
6. Total No. of Courses of the Program:	42	
7. Total Credit Hours of the Program:		134

Note:

- i. The Regulations relating to Undergraduate Degree Programs approved by the Competent Authority and amended from time to time shall be applicable.
- ii. In the list of Institutional elective courses, a student has to take at least one course from Category I. The other course can be taken either from Category I or Category II.
- iii. In order to specialize in a particular track, student must select at least *three* courses from that track. CSC350 and CSC483 (Category of General Computer Science Electives) can be part of any track.

Nadeem Uddin Qureshi
Nadeem Uddin Qureshi
Additional Registrar

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25/01/2017

Computing Core Courses

Sr No.	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	CSC102	Discrete Structures	3(3, 0)	-
2	CSC103	Programming Fundamentals <i>F&CP</i>	4(3, 1)	-
<i>CSD 202</i> 3	CSC211	Data Structures and Algorithms	4(3, 1)	CSC103
<i>CSD 204</i> 4	CSC241	Object Oriented Programming <i>Concepts</i>	4(3, 1)	CSC103
5	CSC291	Software Engineering Concepts	3(3, 0)	-
<i>CSD 300</i> 6	CSC322	Operating Systems <i>Concepts</i>	3(2, 1) <i>(3, 0)</i>	CSC211
7	CSC339	Data Communications and Computer Networks	3(2, 1)	-
8	CSC356	Human Computer Interaction	3(2, 1)	-
<i>CSD 302</i> 9	CSC371	Database Systems <i>(I)</i>	4(3, 1)	CSC241
10	CSC498	Senior Design Project I	2(0, 2)	CSC371, CSC291, HUM102, CSC241
11	CSC499	Senior Design Project II	4(0, 4)	CSC498
12	EEE241	Digital Logic Design	4(3, 1)	-
Total Credit Hours			41	

Computing Supporting Courses

Sr No.	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	MTH104	Calculus and Analytic Geometry	3(3, 0)	-
2	MTH231	Linear Algebra	3(3, 0)	-
3	MTH262	Statistics and Probability Theory	3(3, 0)	-
4	PHY121	Applied Physics for Engineers	4(3, 1)	-
Total Credit Hours			13	

Computing General Education Courses

Sr No.	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	CSC101	Introduction to ICT	3(2, 1)	-
2	CSC110	Professional Practices for IT	3(3, 0)	-
3	HUM100	English Comprehension and Composition	3(3, 0)	-
4	HUM102	Report Writing Skills	3(3, 0)	HUM100
5	HUM103	Communication Skills	3(3, 0)	HUM100

6	HUM110	Islamic Studies **	3(3, 0)	-
7	HUM111	Pakistan Studies	3(3, 0)	-
		Total Credit Hours	21	

**Non-Muslim students can opt for HUM114 Ethics 3(3, 0) course in lieu of HUM110 Islamic Studies, if they intend to.

Computer Science Core Courses

	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	CSC301	Design and Analysis of Algorithms	3(3, 0)	CSC211
2	CSC312	Theory of Automata	3(3, 0)	CSC102
3	CSC321	Microprocessor and Assembly Language	3(2, 1)	EEE241
4	CSC336	Web Technologies	3(2, 1)	CSC241
5	CSC441	Compiler Construction	3(2, 1)	CSC312
6	CSC462	Artificial Intelligence	3(2, 1)	CSC102
7	EEE440	Computer Architecture	3(3, 0)	EEE241
		Total Credit Hours	21	

Computer Science Supporting Areas Courses

	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	CSC475	Numerical Computing	3(3, 0)	MTH104
2	MTH105	Multivariable Calculus	3(3, 0)	MTH104
3	MTH242	Differential Equations	3(3, 0)	MTH104
		Total Credit Hours	9	

Elective Courses

Computer Science Elective Courses

Track I/Specialization : Software Development

Sr No.	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	CSC303	Mobile Application Development	3(2, 1)	CSC241
2	CSC392	Software Design Methodologies	3(3, 0)	CSC291

3	CSC412	Visual Programming	3(2, 1)	CSC241
4	CSC494	Software Project Management	3(3, 0)	CSC291
5	CSC495	Game Development	3(3, 0)	CSC241

Track II/Specialization: Network and Security

Sr No.	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	CSC334	Parallel and Distributed Computing	3(2, 1)	CSC103
2	CSC430	Wireless Networks	3(2, 1)	-
3	CSC432	Information Security	3(3, 0)	CSC339
4	CSC482	Systems and Networks Administration	3(2, 1)	CSC322, CSC339

Track III/Specialization: Database Technologies

Sr No.	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	CSC347	Computational Intelligence	3(3, 0)	CSC241
2	CSC402	Database Systems II	3(3, 0)	CSC371
3	CSC461	Introduction to Data Science	3(3, 0)	MTH231, MTH262
4	CSC471	Distributed Database Systems	3(3, 0)	CSC371
5	CSC496	Data Warehousing and Data Mining	3(2, 1)	CSC371

Track IV/Specialization: Artificial Intelligence and Graphics

Sr No.	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	CSC331	Digital Image Processing	3(3, 0)	MTH231, MTH262
2	CSC353	Computer Graphics	3(2, 1)	MTH231
3	CSC354	Machine Learning	3(3, 0)	-
4	CSC421	Robotics	3(3, 0)	-
5	CSC451	Introduction to Modeling and Simulation	3(2, 1)	CSC102, CSC211
6	CSC454	Pattern Recognition	3(3, 0)	CSC354
7	CSC455	Computer Vision	3(3, 0)	MTH231 & MTH262

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General Computer Science Electives: **

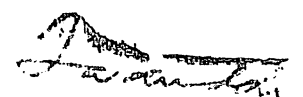
Sr No.	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	CSC350	Topics in Computer Science I	3(3, 0)	-
2	CSC483	Topics in Computer Science II	3(3, 0)	-

Institutional Elective Courses*

Sr No.	Course Code	Course Title	Credit Hours	Pre-requisite (s)
Category I				
1	MGT100	Introduction to Business	3(3, 0)	-
2	MGT101	Introduction to Management	3(3, 0)	-
3	MGT131	Financial Accounting	3(3, 0)	-
4	MGT210	Fundamentals of Marketing	3(3, 0)	-
5	MGT350	Human Resource Management	3(3, 0)	-
Category II				
1	HUM220	Introduction to Psychology	3(3, 0)	-
2	HUM221	International Relations	3(3, 0)	-
3	HUM430	French	3(3, 0)	-
4	HUM431	German	3(3, 0)	-
5	HUM432	Arabic	3(3, 0)	-
6	HUM433	Persian	3(3, 0)	-
7	HUM434	Chinese	3(3, 0)	-
8	HUM435	Japanese	3(3, 0)	-

Sciences Elective Courses

Sr No.	Course Code	Course Title	Credit Hours	Pre-requisite (s)
1	BIO100	Fundamentals of Biology	3(2, 1)	-
2	BIO135	General Chemistry	4(3, 1)	-
3	BIO231	Fundamentals of Genetics	4(3, 1)	-
4	BIO233	Developmental Biology	4(3, 1)	-
5	BIO310	Introduction to Bioinformatics	4(3, 1)	-
6	BSC101	Zoology I	4(3, 1)	-
7	BSC102	Plant Sciences I	4(3, 1)	-
8	BSC206	Introduction to Microbiology	4(3, 1)	-
9	ENV230	Environmental Monitoring	3(2, 1)	-
10	MTH112	Set Theory and Logic	3(3, 0)	-
11	MTH232	Abstract Algebra	3(3, 0)	-



12	MTH251	Set Topology	3(3, 0)	-
13	PHY100	Mechanics and Thermodynamics	4(3, 1)	-
14	PHY120✓	Electricity, Magnetism and Optics	4(3, 1)	-
15	PHY229	Modern Physics	4(3, 1)	PHY120
16	SLS130	Introductory Soil Science I	4(3, 1)	-

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Tentative Study Plan for BS(CS)

This is a proposed model with reference to offering of courses in a particular semester. A campus may make logical changes depending upon their available resources and requirements.

Semester 1				
S. No	Course Code	Course Name	Credit Hours	Pre-Requisite (s)
1	CSC101	Introduction to ICT	3(2, 1)	-
2	HUM100	English Comprehension and Composition	3(3, 0)	-
3	HUM110	Islamic Studies	3(3, 0)	-
4	MTH104	Calculus and Analytic Geometry	3(3, 0)	-
5	PHY121	Applied Physics for Engineers	4(3, 1)	-
Credit Hours			16(14, 2)	

Semester 2				
S. No	Course Code	Course Name	Credit Hours	Pre-Requisite (s)
1	CSC103	Programming Fundamentals	4(3, 1)	-
2	HUM102	Report Writing Skills	3(3, 0)	HUM100
3	MTH105	Multivariable Calculus	3(3, 0)	MTH104
4	CSC110	Professional Practices for IT	3(3, 0)	-
5	CSC102	Discrete Structures	3(3, 0)	-
6		Science Elective I	4(3, 1)	-
Credit Hours			20(18, 2)	

Semester 3				
S. No	Course Code	Course Name	Credit Hours	Pre-Requisite (s)
1	CSC241	Object Oriented Programming	4(3, 1)	CSC103
2	EEE241	Digital Logic Design	4(3, 1)	-
3	MTH262	Statistics and Probability Theory	3(3, 0)	-
4	MTH231	Linear Algebra	3(3, 0)	-
5		Science Elective II	4(3, 1)	-
Credit Hours			18(15, 3)	

Semester 4				
S. No	Course Code	Course Name	Credit Hours	Pre-Requisite (s)
1	CSC211	Data Structures and Algorithms	4(3, 1)	CSC103
2	EEE440	Computer Architecture	3(3, 0)	EEE241
3	CSC291	Software Engineering Concepts	3(3, 0)	-
4	MTH242	Differential Equations	3(3, 0)	MTH104
5	HUM103	Communication Skills	3(3, 0)	HUM100
Credit Hours			16(15, 1)	

Semester 5				
S. No	Course Code	Course Name	Credit Hours	Pre-Requisite (s)
1	CSC312	Theory of Automata	3(3, 0)	CSC102
2	CSC301	Design and Analysis of Algorithms	3(3, 0)	CSC211
3	CSC322	Operating Systems	3(2, 1)	CSC211
4	CSC371	Database Systems I	4(3, 1)	CSC241
5		Computer Science Elective I	3(2, 1)	-
Credit Hours			16(13, 3)	

Semester 6				
S. No	Course Code	Course Name	Credit Hours	Pre-Requisite (s)
1	CSC321	Microprocessor and Assembly Language	3(2, 1)	EEE241
2	CSC339	Data Communications and Computer Networks	3(2, 1)	-
3	CSC356	Human Computer Interaction	3(2, 1)	CSC241
4	CSC336	Web Technologies	3(3, 0)	-
5	HUM111	Pakistan Studies	3(2, 1)	-
6		Computer Science Elective II	3(2, 1)	-
Credit Hours			18(13, 5)	

Semester 7				
S. No	Course Code	Course Name	Credit Hours	Pre-Requisite (s)
1	CSC441	Compiler Construction	3(2, 1)	CSC312
2	CSC462	Artificial Intelligence	3(2, 1)	CSC102
3	CSC475	Numerical Computing	3(3, 0)	MTH104
4		Computer Science Elective III	3(2, 1)	
5		Institutional Elective I	3(3, 0)	
6	CSC498	Senior Design Project I	2(0, 2)	CSC371, CSC291 HUM102, CSC241
Credit Hours			17(12, 5)	

Semester 8				
S. No	Course Code	Course Name	Credit Hours	Pre-Requisite (s)
1		Computer Science Elective IV	3(3, 0)	
2		Computer Science Elective V	3(2, 1)	
3		Institutional Elective II	3(3, 0)	
4	CSC499	Senior Design Project II	4(0, 4)	CSC498
			Total 13(8, 5)	
Total Credit Hours			134 (108, 26)	

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COMSATS Institute of Information Technology
Registrar Office Principal Seat, Islamabad

No: CIIT-Reg/Notif-118/15/165

January 20, 2015

NOTIFICATION

The Academic Council in its 21st meeting held on December 16, 2014 approved the Scheme of Studies of Bachelor of Science (Hons) in Computer Science, effective from Spring 2015:

1. Minimum Duration:

- i. No. of Years: 04
- ii. No. of Semesters: 08

Min No. of Courses. Min No of Cr Hrs

2. Core Courses (List attached)

2.1 Computer Science Courses	19	71
2.2 Engineering Courses	02	08
2.3 Institutional Courses	06	18
2.4 Allied Courses	06	18
2.5. Total Core Courses/Credit Hours	33	115

3. Elective Courses (List attached)

3.1 Computer Science Courses	03-04	09-12
3.2 Institutional Courses	03	09
3.3 Total Elective Courses/Credit Hours	06-07	18-21

4. Total No. of Courses of the Program

39-40

5. Total Credit Hours of the Program:

Min 133-136

This is being issued in continuation of Notification No. CIIT-Reg/Notif-655/12/979 dated July 03, 2012.

Note:

- i. 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.

Jashim Uddin
Nadeem Uddin Qureshi
Additional Registrar

Encl: (Total 61 pages including this page)

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Original

2. List of Core Courses

2.1 Computer Science Courses

Sr. No.	Course Code	Course Title	Credit Hours	Pre-requisite
1.	CSD100	Fundamentals of Computer Programming	4(3, 1)	
2.	CSD101	Discrete Structures	3(3, 0)	
3.	CSD102	Introduction to Information and Communication Technologies	4(3, -1)	
4.	CSD200	Object Oriented Concepts and Programming	4(3, -1)	CSD100
5.	CSD201	Introduction to Software Engineering	3(3, 0)	<i>in place of</i>
6.	CSD202	Data Structures and Algorithms	4(3, 1)	CSD100
7.	CSD203	Computer Organization and Assembly Language	4(3, 1)	CSD100
8.	CSD204	Computer System Architecture	3(3, 0)	CSD203
9.	CSD205	Design and Analysis of Algorithms	3(3, 0)	CSD202
10.	CSD300 ✓	Operating Systems Concepts	3(3, 0)	CSD202
11.	CSD301 ✓	Computer Communication and Networks	4(3, 1)	
12.	CSD302	Database Systems	4(3, 1)	CSD202
13.	CSD303	Professional Practices (IT)	3(3, 0)	
14.	CSD304	Computer Graphics	4(3, 1)	CSD200, MTH231
15.	CSD306	Automata Theory	3(3, 0)	CSD101
16.	CSD400	Human Computer Interaction	4(3, 1)	
17.	CSD402	Artificial Intelligence	4(3, 1)	CSD100
18.	CSD458	Compiler Design and Construction	4(3, 1)	CSD306
19.	CSD499	Project*	6(0, 6)	

For approval

Note;

* The course CSD499 Project will be offered in 7th and 8th semester as 2(0, 2) and 4(0, 4) respectively. Project depicts partial registration and is shown as IP until the project is completed. However, final year project is evaluated upon completion of total 6(0, 6) credit hours

2.2 Engineering Core Courses

✓ 1.	EEE119	Circuits and Electronics	4(3, 1)	
2.	EEE241	Digital Logic Design	4(3, 1)	

2.3 Institutional Courses

1.	HUM100	English Comprehension and Composition	3(3, 0)	
2.	HUM102	Report Writing Skills	3(3, 0)	HUM100
3.	HUM103	Communication Skills	3(3, 0)	HUM100
4.	HUM110	Islamic Studies**	3(3, 0)	
5.	HUM111	Pakistan Studies	3(3, 0)	
6.	MGT101	Introduction to Management	3(3, 0)	

**Non-Muslim students can opt for HUM114 Ethics 3(3, 0) course in lieu of HUM100 Islamic Studies, if they wish.

2.4 Allied Courses

1.	MTH104	Calculus and Analytic Geometry	3(3, 0)	
2.	MTH105	Multivariable Calculus	3(3, 0)	MTH104
3.	MTH231	Linear Algebra	3(3, 0)	
✓ 4.	MTH242	Differential Equations	3(3, 0)	MTH104
5.	MTH262	Statistics and Probability Theory	3(3, 0)	
✓ 6.	MTH375	Numerical Computations	3(3, 0)	MTH231

3. List of Elective Courses**3.1 Computer Science Courses**

Sr. No	Course Code	Course Title	Credit Hours	Pre-requisite
1.	BIO310	Introduction to Bioinformatics	4(3, 1)	
2.	BIO312	Bioinformatics Analysis	4(3, 1)	

3.	CSD305	Advanced Software Engineering	3(3, 0)	CSD201
4.	CSD310	Computer Science Seminars	3(3, 0)	
5.	CSD311	Game Development	4(3,1)	CSD100
6.	CSD312	Media Coding and Processing	3(3, 0)	
7.	CSD313	Embedded Systems	3(3, 0)	
8.	CSD314	IT Security and Risk	3(3, 0)	
9.	CSD315	Machine Learning	3(3,0)	
10.	CSD321	Robotics	4(3,1)	
11.	CSD322	Natural Language Processing	4(3,1)	
12.	CSD328	Distributed Computing	4(3, 1)	CSD100
13.	CSD331	Digital Image Processing	3(3, 0)	
14.	CSD332	Network Security	3(3, 0)	
15.	CSD337	Web Technologies	4(3, 1)	CSD100
16.	CSD343	Network Design and Implementation	3(3, 0)	
17.	CSD344	Wireless and Mobile Computing	3(3, 0)	
18.	CSD354	Network Programming	4(3, 1)	CSD100
19.	CSD412	Cryptography	3(3, 0)	CSD301
20.	CSD421	Systems Programming	4(3, 1)	CSD100
21.	CSD440	Pattern Recognition	3(3,0)	MTH262, MTH231
22.	CSD442	Principles of Programming Languages	3(3, 0)	CSD200
23.	CSD446	Advanced Object Oriented Programming	4(3, 1)	CSD200
24.	CSD448	Data Visualization	3(3, 0)	
25.	CSD449	Semantic Web	3(3,0)	
26.	CSD451	Multimedia and Hypermedia Systems	3(3, 0)	CSD301
27.	CSD452	Virtual Reality	3(3, 0)	CSD304

28.	CSD454	Computer Animation	3(3, 0)	CSD304
29.	CSD455	Computer Vision	3(3, 0)	CSD304
30.	CSD461	Neural Networks	3(3, 0)	CSD402
31.	CSD471	Distributed Database Systems	3(3, 0)	CSD302
32.	CSD477	Advanced Networking	3(3, 0)	
33.	CSD478	Data Warehousing	3(3, 0)	CSD302
34.	CSD479	Data Mining	3(3, 0)	CSD302
35.	CSD482	Computer Law	3(3, 0)	
36.	SED300	Software Requirement Engineering	3(3, 0)	
37.	SED320	Software Project Management	3(3, 0)	

3.2 Institutional Electives

Sr. #	Course Code	Course Title	Credit Hours	Pre-requisite
1.	HUM220	Introduction to Psychology	3(3, 0)	
2.	HUM430	French	3(3, 0)	
3.	HUM431	German	3(3, 0)	
4.	HUM432	Arabic	3(3, 0)	
5.	HUM433	Persian	3(3, 0)	
6.	MGT131	Financial Accounting	3(3, 0)	
7.	MGT350	Human Resource Management	3(3, 0)	MGT101
8.	MGT403	Entrepreneurship	3(3, 0)	MGT101
9.	MGT463	Productivity and Quality Management	3(3, 0)	MGT101
10.	MGT513	New Product Development	3(3, 0)	

Jawad

COMSATS-Lancaster Dual Degree Program**Tentative Study Plan for Bachelor of Science (Hons) in Computer Science.****1st Semester**

Course Code	Course Title	Credit Hours	Prerequisite (s)
HUM110	Islamic Studies	3(3, 0)	
HUM100	English Comprehension and Composition	3(3, 0)	
EEE119	Circuits and Electronics	4(3, 1)	
CSD102	Introduction to Information and Communication Technologies	4(3,1)	
CSD100	Fundamentals of Computer Programming	4(3, 1)	
	Semester Total	18(15, 3)	

2nd Semester

Course Code	Course Title	Credit Hours	Prerequisite (s)
CSD101	Discrete Structures	3(3, 0)	
MTH104	Calculus and Analytic Geometry	3(3, 0)	
HUM103	Communication Skills	3(3,0)	HUM100
EEE241	Digital Logic Design	4(3,1)	
CSD200	Object Oriented Concepts and Programming	4(3, 1)	CSD100
HUM111	Pakistan Studies	3(3,0)	
	Semester Total	20(18, 2)	

3rd Semester

Course Code	Course Title	Credit Hours	Prerequisite (s)
HUM102	Report Writing Skills	3(3, 0)	HUM100
CSD203	Computer Organization and Assembly	4(3, 1)	CSD100

	Language		
MGT101	Introduction to Management	3(3, 0)	
MTH105	Multivariable Calculus	3(3, 0)	MTH104
CSD202	Data Structures and Algorithms	4(3, 1)	CSD100
	Semester Total	17(15, 2)	

4th Semester

Course Code	Course Title	Credit Hours	Prerequisite (s)
MTH231	Linear Algebra	3(3, 0)	
CSD205	Design and Analysis of Algorithms	3(3, 0)	CSD202
MTH242	Differential Equations	3(3, 0)	
CSD201	Introduction to Software Engineering	3(3, 0)	
CSD204	Computer System Architecture	3(3, 0)	CSD203
	Elective Institutional I	3(3, 0)	
	Semester Total	18(18, 0)	

5th Semester

Course Code	Course Title	Credit Hours	Prerequisite (s)
CSD300	Operating Systems Concepts	3(3, 0)	CSD202
CSD301	Computer Communication and Networks	4(3, 1)	
MTH375	Numerical Computations	3(3, 0)	MTH231
CSD302	Database Systems	4(3, 1)	CSD202
MTH262	Statistics and Probability Theory	3(3, 0)	
	Semester Total	17(15, 2)	

6th Semester

Course Code	Course Title	Credit Hours	Prerequisite (s)
CSD303	Professional Practices (IT)	3(3, 0)	
CSD304	Computer Graphics	4(3, 1)	CSD200, MTH231
CSD306	Automata Theory	3(3,0)	CSD101
	Elective Institutional II	3(3, 0)	
	Elective I	3(3, 0)/4(3,1)	
	Semester Total	16(15,1)/17(15,2)	

7th Semester

Course Code	Course Title	Credit Hours	Prerequisite (s)
CSD402	Artificial Intelligence	4(3, 1)	CSD100
CSD400	Human Computer Interaction	4(3, 1)	
CSD458	Compiler Design and Construction	4(3,1)	CSD306
	Elective II	3(3,0)/4(3,1)	
CSD499*	Project	2(0, 2)	
	Semester Total	17(12,5)/18(12,6)	

8th Semester

Course Code	Course Title	Credit Hours	Prerequisite (s)
	Elective III	3(3/0)/4(3,1)	
	Elective Institutional III	3(3,0)	
CSD499	Project	4(0, 4)	
	Semester Total	10(6,4)/11(6,5)	
	Program Total	133(114,19)-136(114,22)	