Ministry of Higher Education of Afghanistan

SALAM UNIVERSITY

Faculty of Computer Science

Curriculum for Department of Computer Science

Batch 29

www.salam.edu.af

KolulaPushta Rd, Kabol, GuliSurkh Square, Kabul Afghanistan

PREFACE

We live in the era of information revolution. In fact, there are revolutions that are taking place around us, like space revolution and now the more challenging information revolution. Our basic aim was to design a systematic, well structured, and consistent syllabus for BS four-year programs. The New Syllabus covers all aspects necessary for student for better understandability of Computer System. In other word, this Syllabus accommodates various Computer professional fields such as Networking, Database, Programming and Software Engineering fields in a smooth way.

This Syllabus maintains the flow for various kinds of subjects, means that the subjects are placed in proper position throughout the four years course program. We have tried to provide an easy learning solution for the BS students, which are not only to fulfill their future requirements for a good computer programmer but also to provide self-motivating platform.

Dean,
Faculty of Computer Science,
Salam University,
Kabul, Afghanistan.

ACKNOWLEGEMENTS

We cannot seek words at our command to express our deepest sense of gratitude to Almighty Allah, the most merciful, mighty, and beneficent, for the blessing. He bestowed upon us. We have been able to complete this lengthy and enormous task for the talent, intellect and mental powers that He gifted with.

We extend our appreciation and gratitude to Dr. **Misbah Ullah "Abdulbaqi"**, Chancellor of Salam University for his constant supervision, useful suggestions, Tips and especially for friendly treatment environment and encouragement during the project period.

We also heartedly thanks to Dr**. Abobaker "Modaqeq"**, Academic Chancellor of Salam University, for his cooperation and for showing keen interest in the designing of the courses and extending his supervision toward the successful completion of the syllabus.

We appreciate the pure efforts and painstaking task of **Mr. Zarmash "Gardiwal",** Dean of Faculty of Computer Science and **Mr. Mir Mohammad Naim "Sadat",** HOD of Computer Science. Their appreciation and Cooperation enable the Team Syllabi Design to work out this outcome.

Our acknowledgement would be incomplete if we do not mention the efforts and valuable suggestions of Permanent and visiting lecturers of CS Faculty members.

TEAM (Curriculum Committee)

Contents

List of Tables

Introduction

Introduction of SALAM University

Salam University has been established by a group of purposeful and Muslim teachers who have taught at different universities in Afghanistan and abroad. Salam University which has been authorized by the Ministry of Higher Education, Afghanistan, is committed to soundly nuttier the young generation of beloved homeland in different fields and decorates them with the ornament of knowledge. Salam University comprises of the following faculties.

1- Faculty of Sharia & Law

2- Faculty of civil Engineering

3- Faculty of Economics

4- Faculty of Law and Political Science

5- Faculty of Computer Science

Salam University, through the above mentioned faculties presents a high quality education for the society, in order to bring up a generation equipped with modern technology besides Islamic and National behaviors, so that they may face the upcoming challenges in future.

Objectives of Salam University:

1 – To pave the way for the best quality higher education at least to B.A level, in line with Islamic and national desirers.

2 – To bring up qualified academicians teachers and specialist in different fields of knowledge and to promote and upgrade academic activities.

3 – To promote the academic and research affairs through academic skills and modern technology, in order to advance the country socially, economically, academically and culturally.

4 – To transfer science and technology by exploiting the international experiences present novelties and to promote the standard ways at teaching.

5 – To nurturer and boost up the hidden skills and talents at juveniles, to ameliorate the education process and raise the students' skills theoretically as well as practically.

6 – To serve the nation in the fields of knowledge and culture and to participate in reconstruction and rehabilitation of Afghanistan through this way.

Introduction, Faculty of Computer Science

Faculty of Computer Science was established in 2011 and it has been engaged in promoting education and research in the fast growing field of software technology to produce computer science specialists and meet the global challenges. CS faculty is the youngest, but the most dynamic faculty in SALAM. Offering state of the art education in the most advanced fields of the world, it has grown exponentially since its establishment.

Computer Science Faculty of Salam University has two dedicated departments namely department of Computer Science and department of Information and Technology. The purpose of this faculty is to provide solid foundation to prepare students meet the challenges in the most emerging fields of Computer Science such as Networking, Programming, Databases, and Software Engineering etc. Computer Science has 30 faculty members (National/ International) having PhD and master degrees along with professional experience in various fields of computer science.

The computer science bachelors program specializes in providing expert classroom trainings. The faculty members have developed a comprehensive syllabus to help to prepare IT Professional, mastering their skills needed for successful delivery in the future development of Afghanistan.

The lectures/presentation/seminars delivered by professional lecturers at the Faculty of Computer Science will help to provide practical real-world experience. Students are tested and given a practical exercise in order to polish their skills and enrich their knowledge. The BCS/BIT degree programs are designed to give latest, globally competitive skill to students.

Faculty Vision

Faculty of Computer Science wants to be recognized as a national level quality academic and research-oriented computing center, and to educate industry aligned students with technical capabilities for the growth of our country.

Faculty Mission

Computer Science Faculty is keen to solve computing problems of the society through research and experiment by qualified faculties and trained students. Providing quality education, which can develop capabilities of the students both in application and theoretical aspects.who will contribute positively to the economic well-being of our region and to develop systems that solve problems on national level in technology.

The faculty of Computer Science has following two departments:

Department of Computer Science
Department of Information Technology

Introduction of New Curriculum for Department of Computer Science

The Curriculum is the core requirement of education, especially higher education in modern education culture. It represents the scheme of learning of different subjects in different areas of the course. It also illustrates the educational level of an institution.

A curriculum has to be devised in a manner so as to make it always updatable and modifiable. This feature formulates its capability to accept any upcoming changes in any area or subject on the basis of academic research and new innovations.

The BS courses of the department in the previous version of the syllabus are not all sufficient, hence leaving some major needs of the education in Computer Science. Few subjects are totally out-dated while other key subjects were still missing.

The new course has been developed keeping in view all the problems and shortcomings of the current syllabus while focusing on some different curriculums taught at different internationally and nationally recognized universities. The curriculum is attempted not to lack behind in any area while comparing it with that of other Institutions and Universities.

CS Department Vision

To build the most encouraging environment for excellence academic and research oriented education in computer science and prepare the students for a globalized technological society and turn them towards helping the society.

CS Department Mission

To convey quality professional training at the undergraduate level with an emphasis on the fundamental concepts of computer science.

To build nationally recognized research center and encourage the students to wide research experience.

To build the capacity of the students with the essential skills to solve the technological problems of the society, teach ethical values and interpersonal skills to the students.

Objectives of Computer Science Department

I. Strong problem solving skills grounded in a strong technical background in computer science,

II. A broad educational background that enables making interdisciplinary connections and provides a solid foundation for life-long learning.

III. Troubleshooting and resolving of computers, routers and switches and presenting appropriate solutions for security problems in network systems of organizations.

IV. Making familiar to new technological methods to develop new software applications and electronic service delivery systems.

V. An awareness and understanding of the professional, technical and ethical issues of the rapidly evolving computing industry and the judgment to apply this understanding, so that they may become leaders and provide a contribution to the greater good, professionally and in their community, via mentoring, or professional involvement.

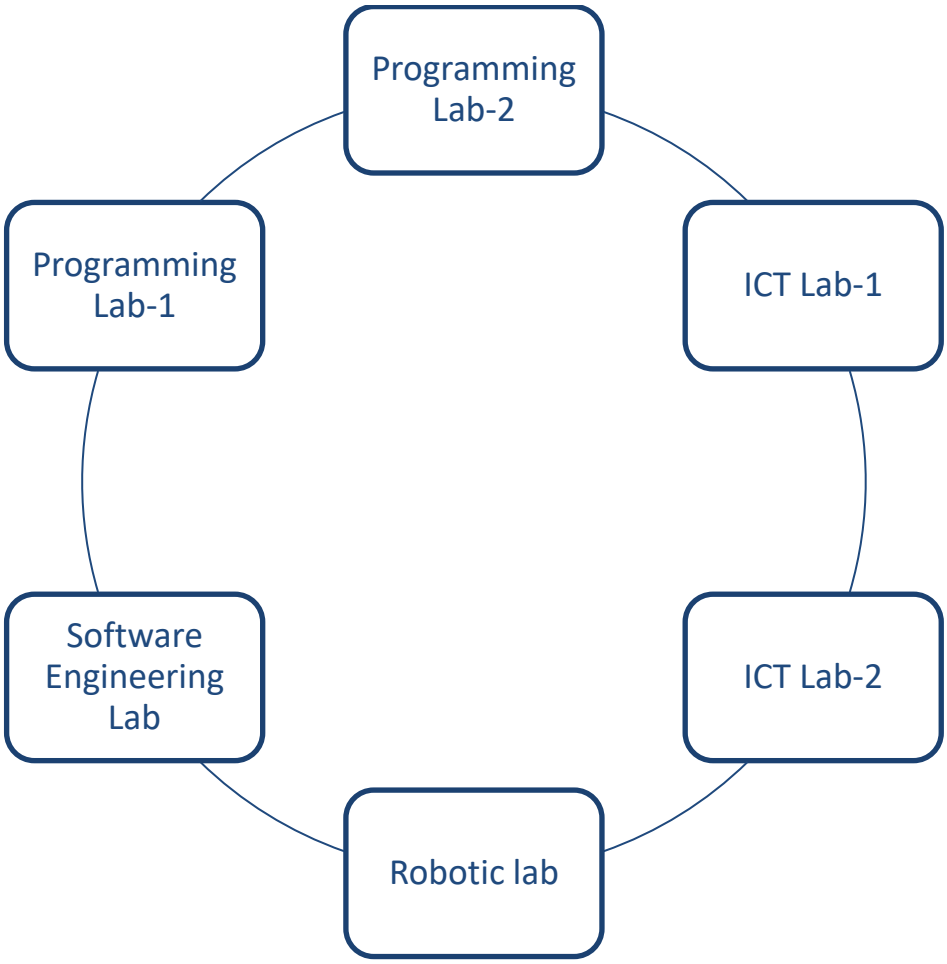
VI. Demonstrate proficiency in problem-solving techniques using computer

VII. Demonstrate comprehension of modern software engineering principles and proficiency in the analysis of complex problems and the synthesis of solutions to those problems

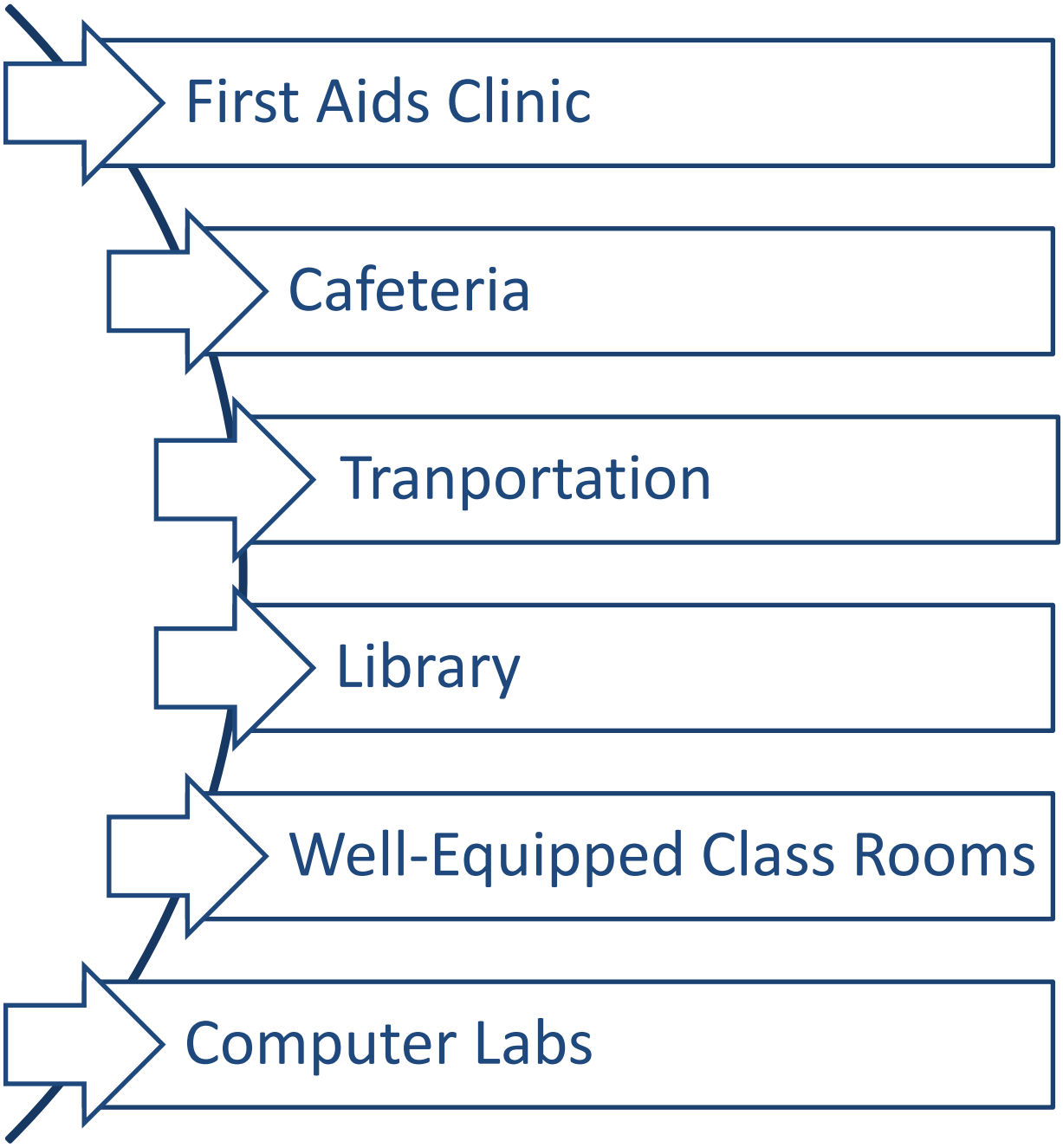
VIII. Demonstrate a breadth and depth of knowledge in the discipline of computer science

IX. Think critically and creatively to solve local or global problems and become lifelong learners and contributors to society.

Computer Labs



Facilities


First Aids Clinic
Cafeteria
Tranportation
Library
Well-Equipped Class Rooms
Computer Labs

CS Department Faculty Members

NO	Name	Surname	Qualification	Rank
1	Salim khan	Ahmadzay	Master	Nil
2	Naseer Ahmad	Shinwari	Master	Nil
3	Ajmal	Azizi	Master (In – Progress)	Nil
4	Zarmash	Gardiwal	Master	Nil
5	Mustafa	Tokhi	Bachelor	Nil
6	Mir.M.Naim	Sadat	Master	Nil

Table 1 CS Department Faculty Members

Academic System of BCS

The Bachelor of Computer Science combines a solid core of computer science courses; we are living in the era of information revolution. In fact there are revolutions that are taking place around us, like space revolution and now the more challenging information revolution. Our basic aim was to design a systematic, well structured, and consistent syllabus for BS four year programs. The New Syllabus covers all aspects necessary for students for better understandability of the Computer System. In other words this Syllabus accommodates various Computer professional fields such as Networking, Database, Programming and Software Engineering fields in a smooth way.

Objectives of New Curriculum

1. Devise a syllabus according to the modern trends in Computer Science and its different fields, so students will become beneficial in society after their education.
2. Design the Courses which increase the interests of the students in their studies.
3. Remove any burden of extra subjects or the subjects which are of no or least use in the professional life of Computer Scientists
4. Make students eligible to compete not only on national but also on international level.
5. To follow the rules and regulations of the Ministry of Higher Education of Afghanistan

Background

The newly designed Curriculum is the most appropriate and according to the modern trends in the field of Computer Science. This curriculum offers subjects in different subject lines covering all major areas of the field, for example: Software Engineering, Databases, Network, Web, Programming, AI etc.

Each area progresses smoothly in a proper sequence of subjects starting from beginning and moving gradually to the advanced levels.

The curriculum is designed on the basis of eight semesters in four years, with two semesters per year. This is reason that the curriculum is flexible enough to be updated or modified at any time when needed. So in future any out-dated and inadequate subject will easily be replaced with most contemporary and suitable one.

This curriculum also depicts the subject outlines for each subject, that will serve as a road map towards the main topics in the subject and instructor of the subject will be able to work out the detailed course contents.

Also the course codes are simple enough and apt following the basic needs of education system in the country.

Needs Assessment

Student Outcomes

The outcomes describe the core competencies expected of all Computer Science graduates from Computer Science department. The focus of the program is on preparing graduates for software development careers that emphasize mathematical, scientific, and engineering applications. The program also prepares students for their careers by emphasizing communication, teamwork, ethics, and by examining the local, global, and societal impacts of innovation and technological advancement. At the time of graduation, all students will:

1. possess a strong foundation in the software development process;
2. be able to solve problems using a variety of programming languages and have extensive experience with at least one high-level language;
3. have a background in computer hardware and experience with a variety of operating systems;
4. possess an extensive background in mathematics and an appreciation of the scientific method;
5. have an understanding of the theoretical foundations of computing;
6. have developed effective communication skills and have experience working with teams;
7. Possess an understanding of professional, ethical, legal, security and social issues and responsibilities.

Relationship of Student Outcomes to Program Educational Objectives

While all outcomes support the educational objectives to some degree, the table below (Table 1) indicates the programmatic Student Outcomes which most strongly support each objective. Outcomes 1 (software development), 2 (language skills), and 3 (hardware and systems) are foundational skills required for any position in industry. These are essential for the achievement of Objectives 1 (mastery of the field) and 5 (life-long learning). The ability to pursue an advanced degree (Objective 2) and to do research or contribute to the field of computer science in other ways (Objective 4) is enhanced by Outcomes 4 (mathematics and science), 5 (theoretical foundation), and 7 (social responsibility). Leadership potential (Objective 3) is a difficult skill to teach but Outcomes 6 (communication skills) and 7 (social responsibility) are vital tools for an aspiring leader.

	Program Objectives				
Computer Science Program	Graduates who have entered industry will have demonstrated a mastery of their field.	Graduates who continued their education beyond the bachelor's level will have the necessary background to successfully complete advanced degrees.	Graduates will have demonstrated their ability to assume leadership roles through career advancement or by assuming responsibilities beyond those expected of entry-level positions.	Graduates will be involved in their profession and make contributions to the field of computer science	Graduates will have the requisite foundation for life-long learning and will possess the skills to adapt and thrive in the rapidly changing field of computer science.
Student Outcomes					
1. possess a strong foundation in the software development process;	✓	✓	✓	✓	✓
2. be able to solve problems using a variety of programming languages and have extensive experience with at least	✓	✓	✓	✓	✓

one high-level language;					
3. have a background in computer hardware and experience with a variety of operating systems;	✓	✓	✓	X	✓
4. possess an extensive background in mathematics and an appreciation of the scientific method;	✓	✓	✓	✓	✓
5. have an understanding of the theoretical foundations of computing	✓	✓	✓	✓	✓
6. have developed effective communication skills and have experience working with teams;	✓	✓	✓	✓	✓
7. Possess an understanding of professional, ethical, legal, security and social issues	✓	✓	✓	✓	✓

and responsibilities .					

Table 2 Mapping Program Student Outcomes to Program Objectives

Process for the Establishment and Revision of the Student Outcomes

The primary stakeholders in the development and revision of the student outcomes are (1) industry (2) students and alumni (3) the faculty

Constituents	Mechanism for Participation
Industry	The industrial advisory board, recruiters
Graduates	Alumni surveys, departmental involvement
Current students	Senior exit surveys
Faculty	Curriculum committee

Table 3Primary Stakeholders for Computer Science Program

1. *Industry*: The CS program has had an Industrial Advisory Board (IAB) since 2012. The board typically meets on campus every two years but provides input during the intervening time as requested. The IAB folder contains the PowerPoint presentations for each IAB meeting since its creation. The initial IAB presentations are made to the students, the faculty, and the administration (separately) allowing the IAB to incorporate feedback from each group into their final presentation.
2. *Graduates*: The department has attempted to gather statistically valid data on alumni opinions about the program but, as is often the case, survey response rates are too low to be meaningful. The CS program is fortunate to have strong alumni involvement in a variety of ways which provides an alternate means of gathering input from graduates of the program.
3. *Current Students:* The main mechanism for soliciting input from current students is through the Exit Interviews. All graduating seniors are invited to participate in a group discussion about the strengths and weaknesses of the program. Almost all of the graduating seniors will have had at least one industrial experience and can provide insightful comments about the program's ability to prepare graduates for industry careers. Student comments on the IDEA forms – the student evaluation surveys used at the end of a course – also provide valuable assessment information.
4. *Faculty*: All computer science faculty members serve on the CS Curriculum Committee. This is a cohesive group with considerable power to change the curriculum and the assessment program. The curriculum committee meets once per year to review and refine the Program Objectives and Student Outcomes.

Student Evaluation Methods

Students in computer science department are evaluated in many stages in each subject in order to distribute their semester activities and test their learning, the total 100 marks in each subject is evaluated as stated bellow:

1. Students are required to submit multiple assignments, presentations and/or projects based on the subject type and requirements during the semester which carries a total of 20 marks termed as students' internal evaluation.
2. At the middle of each semester a paper based exam called midterm exam is conducted which carries a total of 20 marks.
3. At the end of the semester a paper based exam is conducted called the End term exam of final exam which carries a total of 60 marks and concludes the semester.

Student internship and academic tour

Here in computer science department we organize academic tours to the students where they are taken to industries as software industry, IT industry, multiple official administration and/or private sector organization which help them get the idea of a working in any of the mentioned industries, knowing the process and flow of work and develop a sound vision of their future carriers.

In 7^{th} and 8^{th} semester students are required to carry out a project where they will need to go to an organization, observe their work process, asses their needs and provide a technical solution. The solution might be developing a system (building a web based application, desktop application, and mobile application), designing a network or doing research on a problem for the improvement of the organization and society.

Overview of CS's Department Subjects Credit Hours

S/No	Subject Categories	Credit Hours	Percentage	Lecture	Practical
1	Inclusive Subjects	**16**	**11.27 %**	**13**	**6**
2	Core Subjects	**43**	**30.38 %**	**31**	**24**
3	Professional Subjects	**77**	**54.23 %**	**41**	**72**
4	Monograph and Internship	**6**	**4.23%**	**0**	**12**
5	Total	**142**	**100 %**	**85**	**114**

Table 4 Overview of CS's Department Subjects Credit Hours

Department of Computer Science

Category	No	Subject	Code	Semester								Total Credit
				1	2	3	4	5	6	7	8	
Inclusive Subjects	**1**	Islamic Studies-I	CS-CS-0107	1								**1**
	2	Islamic Studies-II	CS-CS-0207		1							**1**
	3	Islamic Studies-III	CS-CS-0307			1						**1**
	4	Islamic Studies-IV	CS-CS-0407				1					**1**
	5	Islamic Studies-V	CS-CS-0507					1				**1**
	6	Islamic Studies-VI	CS-CS-0607						1			**1**
	7	Islamic Studies-VII	CS-CS-0707							1		**1**
	8	Islamic Studies-VIII	CS-CS-0807								1	**1**
	9	History	CS-CS-0106	1								**1**
	10	Environmental Protection	CS-CS-0212		2							**2**
	11	Elective-I	CS-CS-0724							2		**2**
	12	Elective-II	CS-CS-0824								3	**3**
	Total Credit Hrs.			**16**								
	Percentage			**11.27%**								

Table 5 Inclusive Subjects

Category	No	Subject	Code	Semester								Total Credit
				1	2	3	4	5	6	7	8	
Core Subjects	1	IT Fundamentals	CS-CS-0101	3								3
	2	Introduction to Computer Programming	CS-CS-0102	3								3
	3	Computer Application	CS-CS-0103	3								3
	4	General Mathematics	CS-CS-0104	3								3
	5	Functional English-I	CS-CS-0105	3								3
	6	E-Commerce	CS-CS-0209		3							3
	7	Electronic Physics	CS-CS-0210		2							2
	8	Functional English-II	CS-CS-0205		3							3
	9	Discrete Mathematics	CS-CS-0313			3						3
	10	Introduction to Network	CS-CS-0315			3						3
	11	English Composition	CS-CS-0305			2						2
	12	Database Concepts	CS-CS-0316			3						3
	13	Digital Logic & Computer Design	CS-CS-0523					2				2
	14	Data Structure	CS-CS-0526					3				3
	15	Probability & Statistics	CS-CS-0630						2			2
	16	Business Communication	CS-CS-0737							2		2
	Total Credit Hrs.			43								
	Percentage			30.38%								

Table 6 Core Subjects

Category	No	Subject	Code	Semester								Total Credit
				1	2	3	4	5	6	7	8	
Professional Subjects	1	Programming Concepts	CS-CS-0208		3							3
	2	Web Fundamentals-I	CS-CS-0211		3							3
	3	Object Oriented Programming	CS-CS-0314			3						3
	4	Web Fundamentals-II	CS-CS-0311			3						2
	5	Database Management System	CS-CS-0417				3					3
	6	Web Engineering	CS-CS-0418				3					3
	7	System Administration	CS-CS-0419				3					3
	8	Data Communication	CS-CS-0420				2					2
	9	Computer Organization & Architecture	CS-CS-0421				2					2
	10	Advanced Programming	CS-CS-0422				4					4
	11	Software Engineering-I	CS-CS-0524					3				3
	12	Operating System Concepts	CS-CS-0525					3				3
	13	Advanced Web Engineering	CS-CS-0527					2				2
	14	Network Engineering	CS-CS-0528					4				4
	15	Analysis of Algorithm	CS-CS-0629						3			3
	16	Software-Engineering-II	CS-CS-0624						2			2
	17	Visual Programming	CS-CS-0631						4			4
	18	Advanced Computer Network	CS-CS-0632						3			3
	19	Artificial Intelligence	CS-CS-0633						2			2
	20	Mobile Application Development	CS-CS-0735							4		4
	21	Automata Theory & Compiler Construction	CS-CS-0736							3		3
	22	Academic Report Writing	CS-CS-0738							2		2
	23	Software Project Management	CS-CS-0739							3		3
	24	Network Security	CS-CS-0840								3	3
	25	Research Methodology	CS-CS-0841								2	2
	26	Human Computer Interaction	CS-CS-0842								2	2
	27	Distributed Database Concepts	CS-CS-0844								3	3
	Total Credit Hrs.		**77**									
	Percentage		**54.23%**									

Table 7 Professional Subjects

	No	Subject	Code	Semester								Total Credit
				1	2	3	4	5	6	7	8	
Internship and Monograph	1	Project (Monograph)	CS-CS-0843								6	6
	Total Credit Hrs.			6								
	Percentage			4.23%								

Table 8 Internship and Research

Total Credit Hours for all 8 Semesters are 142.

	Theory	Practical		Total
		Classes	Credit	
Credit Hours	85	114	57	142
Percentage	59.85 %	40.14 %		100 %

Table 9 Theory and Practical Credits Ratio

First Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	IT Fundamentals	CS-CS-0101	3	1	4	5	Core	NIL
2	Introduction to Computer Programming	CS-CS-0102	3	1	4	5	Core	NIL
3	Computer Application	CS-CS-0103	3	1	4	5	Core	NIL
4	General Mathematics	CS-CS-0104	3	3	0	3	Core	NIL
5	Functional English-I	CS-CS-0105	3	3	0	3	Core	NIL
6	History	CS-CS-0106	1	1	0	1	Inclusive	NIL
7	Islamic Study-I	CS-CS-0107	1	1	0	1	Inclusive	NIL
	Total		17	11	12	23		

Second Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Programming Concepts	CS-CS-0208	3	1	4	5	Professional	CS-CS-0102
2	E-Commerce	CS-CS-0209	3	1	4	5	Core	CS-CS-0101
3	Electronic Physics	CS-CS-0210	2	2	0	2	Core	NIL
4	Web Fundamentals-I	CS-CS-0211	3	1	4	5	Professional	NIL
5	Functional English-II	CS-CS-0205	3	3	0	3	Core	CS-CS-0105
6	Environmental Protection	CS-CS-0212	2	2	0	2	Inclusive	NIL
7	Islamic Study-II	CS-CS-0207	1	1	0	1	Inclusive	CS-CS-0107
	Total		17	11	12	23		

Third Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Discrete Mathematics	CS-CS-0313	3	3	0	3	Core	NIL
2	Object Oriented Programming	CS-CS-0314	3	1	4	5	Professional	CS-CS-0208
3	Introduction to Network	CS-CS-0315	3	1	4	5	Core	CS-CS-0101
4	Web Fundamentals-II	CS-CS-0311	3	1	4	5	Professional	CS-CS-0211
5	English Composition	CS-CS-305	2	2	0	2	Core	CS-CS-0205
6	Database Concepts	CS-CS-0316	3	2	2	5	Core	NIL
7	Islamic Studies-III	CS-CS-0307	1	1	0	1	Inclusive	CS-CS-0207
	Total		18	11	14	26		

Fourth Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Database Management System	CS-CS-0417	3	1	4	5	Professional	CS-CS-0316
2	Web Engineering	CS-CS-0418	3	1	4	5	Professional	CS-CS-0311
3	System Administration	CS-CS-0419	3	1	4	5	Professional	CS-CS-0315
4	Data Communication	CS-CS-0420	2	2	0	2	Professional	NIL
5	Computer Organization & Architecture	CS-CS-0421	2	2	0	2	Professional	NIL
6	Advanced Programming	CS-CS-0422	4	2	4	6	Professional	CS-CS-0314
7	Islamic Studies-IV	CS-CS-0407	1	1	0	1	Inclusive	CS-CS-0307
	Total		**18**	**10**	**16**	**26**		

Fifth Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Digital Logic & Computer Design	CS-CS-0523	2	2	0	2	Core	NIL
2	Software Engineering-I	CS-CS-0524	3	3	0	3	Professional	NIL
3	Operating System Concepts	CS-CS-0525	3	3	0	3	Professional	NIL
4	Data Structure	CS-CS-0526	3	2	2	5	Core	NIL
5	Advanced Web Engineering	CS-CS-0527	2	1	2	3	Professional	CS-CS-0418
6	Network Engineering	CS-CS-0528	4	1	6	7	Professional	CS-CS-0419
7	Islamic Studies-V	CS-CS-0507	1	1	0	1	Inclusive	CS-CS-0407
	Total		**18**	**13**	**10**	**24**		

Sixth Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Analysis of Algorithm	CS-CS-0629	3	2	2	4	Professional	CS-CS-0526
2	Software-Engineering-II	CS-CS-0624	2	1	2	3	Professional	CS-CS-0524
3	Probability and Statistics	CS-CS-0630	2	2	0	2	Core	CS-CS-0313
4	Visual Programming	CS-CS-0631	4	2	4	6	Professional	NIL
5	Advanced Computer Network	CS-CS-0632	3	1	4	5	Professional	CS-CS-0528
6	Artificial	CS-CS-0633	2	1	2	3	Professional	NIL

	Intelligence							
7	Islamic Studies-VI	CS-CS-0607	1	1	0	1	Inclusive	CS-CS-0507
	Total		**17**	**10**	**14**	**24**		

Seventh Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Elective Subject-I	CS-CS-0734	2	1	2	3	Elective	NIL
2	Mobile Application Development	CS-CS-0735	4	2	4	6	Professional	CS-CS-0422
3	Automata Theory & Compiler Construction	CS-CS-0736	3	3	0	3	Professional	CS-CS-0629
4	Business Communication	CS-CS-0737	2	2	0	2	Core	NIL
5	Academic Report Writing	CS-CS-0738	2	2	0	2	Professional	NIL
6	Software Project Management	CS-CS-0739	3	1	4	5	Professional	CS-CS-0624
7	Islamic Studies-VII	CS-CS-0707	1	1	0	1	Inclusive	CS-CS-0607
	Total		**17**	**12**	**10**	**22**		

Eighth Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Elective Subject-II	CS-CS-0834	3	1	4	5	Elective	NIL
2	Network Security	CS-CS-0840	3	1	4	5	Professional	CS-CS-0632
3	Research Methodology	CS-CS-0841	2	2	0	2	Professional	NIL
4	Human Computer Interaction	CS-CS-0842	2	1	2	3	Professional	NIL
5	Project (Monograph)	CS-CS-0843	6	0	12	12	Project	NIL
6	Distributed Database Concepts	CS-CS-0844	3	1	4	5	Professional	CS-CS-0417
7	Islamic Studies-VIII	CS-CS-0807	1	1	0	1	Inclusive	CS-CS-0707
	Total		**20**	**7**	**26**	**33**		

Total Credit Hours: 142

First Semester Course Outlines

First Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	IT Fundamentals	CS-CS-0101	3	1	4	5	Core	NIL
2	Introduction to Computer Programming	CS-CS-0102	3	1	4	5	Core	NIL
3	Computer Application	CS-CS-0103	3	1	4	5	Core	NIL
4	General Mathematics	CS-CS-0104	3	3	0	3	Core	NIL
5	Functional English-I	CS-CS-0105	3	3	0	3	Core	NIL
6	History	CS-CS-0106	1	1	0	1	Inclusive	NIL
7	Islamic Study-I	CS-CS-0107	1	1	0	1	Inclusive	NIL
	Total		17	11	12	23		

IT Fundamentals

Subject Name	IT Fundamentals
Subject Code	CS-CS-0101
Subject Status	Core
Credits	03
Course Objectives	Computer is one of the most advanced and fast growing technology of the world, Each and every day a lot of improved emerging in both software and hardware of the computer. In response to this trend this course has been designed. It focuses on brief introduction to computers history and types of computer. It also provides students how to deal with different kinds of Hardware.
Reference Books	a. Fundamental Concepts of Computer System by Asiya Sultan Ali, AmenaNudrat. b. Using Information Technology, Second Edition by Sawyer William c. Computing essentials, Fifteen Edition by Timothy I. O'Leary, Linda I.O'Leary.
Weeks	**Topics**
1st week	Introduction to IT • History of Computers • Components of Computers • Functions of Computers

2nd week	Generations of Computers • Categorization of Computers based on Processing Power. • Categorization of Computers based on Data Processing.
3rd week	Definition of data and information • Difference between data and information • Data processing cycle (input, process, output, storage) • Types of data
4th week	Introduction to Hardware o Input Devices o Output Devices o I/O Devices
5th week	Memory Devices, Primary Memory, RAM, ROM,Cache,Secondary Memory,HDD,SSD,Optical Storage,Memory Hierarchy,Storage capacity and data access,speeds
6th week	Processing Devices,CPU, GPU,Motherboard,Buses,Power supply Chipsets
7th week	Introduction to software,Types of Software,Operating systems (Windows,macOS, Linux),Utility programs and drivers,Introduction to open-source vs,proprietary software
8th week	Introduction to Number Systems,Understanding binary, decimal, octal, and hexadecimal systems,Converting between number systems,Representation of data (text,images, and sound) Lab/AssignmentNumber system conversions using manual calculation and a calculatortool
Mid Term Exam	
9th week	**Representation of data (text, images, and sound)** **• Lab/Assignment:** **• Number system conversions using manual calculation and a calculator tool**
10th week	**Introduction to Database** **• Types of databases: relational vs non-relational** **• Introduction to Database management systems (DBMS)**
11th week	**Introduction to Network.** **• Types of Network: LAN, WAN, MAN** **• Networking Devices (Routers, Switches, Modems, etc.)**

12th week	**Introduction to the Internet: How it works** **• Internet services (WWW, email, FTP, VoIP)** **• Browsers, search engines, and safe browsing** **• Introduction to Cloud Computing and its models (IaaS, PaaS, SaaS)**
13th week	**Introduction to cybersecurity concepts** **• Types of security threats (malware, viruses, phishing)** **• Basic computer security practices (firewalls, antivirus software, passwords)**
14th week	**Overview of Artificial Intelligence, Machine Learning, and Big Data** **• Introduction to IoT (Internet of Things)** **• Virtual and Augmented Reality**
15th week	**Digital Literacy** **• Cyber Ethics and Digital Citizenship** **• Identifying Misinformation and Deepfakes** **• Digital Footprint and Online Privacy** **• AI Awareness in Everyday Life**
16th week	**Overview of the course** **• IT careers and future opportunities**
Final Term Exam	

Introduction to Computer Programming

Subject Name	Introduction to Computer Programming
Subject Code	CS-CS-0102
Subject Status	Core
Credits	03
Course Objectives	The aim of this course is to provide basics of programming language using C or C++, act as foundation for higher level programming. After completing this course the students will be able to write small and medium level of programs.
Reference Books	a. Robert Lafore ,C Programming using Turbo++ b. Deitel&Deitel, C How to program c. Let Us C by yashavantkanetkar
Weeks	**Topics**
1st week	**Chapter one: Introduction** • Language • Types of Languages • Common definitions concerned with programming languages • Why programming Types of computer languages
2nd week	**Chapter one: Introduction** • Differentiation of complier, assembler and interpreter • History of C++ • Why Study C++ • Program and Types of code • Source code • Object code • Executable code
3rd week	**Chapter one: Introduction** • Explaining IDE (Integrated Development Environment) • Process of Executing C++ Program Console Output (cout)
4th week	**Chapter two: Programming Constructs** • Data Types • Constant • Keywords and Reserved Words Statement and instruction
5th week	**apter two: Programming Constructs** • Variable • Identifier Rules for constructing identifier

6th week	**Chapter two: Programming Constructs** • Rules for writing C++ program • Comments • Different ways of comments • Types of instructions • Arithmetic Instruction Console Input (cin)
7th week	**Chapter three: Operators** • Types of Operators • Assignment Operator • Arithmetic Operators Compound Assignment Operator
8th week	**Chapter three: Operators** • Increment/decrement operator a. Prefix increment/decrement b. Postfix increment/decrement • Logical Operators • Relational Operators
Mid Term Exam	
9th week	**Chapter three: Operators** • Increment/decrement operator a. Prefix increment/decrement b. Postfix increment/decrement • Logical Operators • Relational Operators
10th week	**Chapter Four: Decision Control structure** • Nested if-else statement Lab Session
11th week	**Chapter Four: Decision Control structure** • Switch statement Lab Session
12th week	**Chapter Five: Loops** • While Loop • Syntax of while loop Lab Session
13th week	**Chapter Five: Loops** • Do while Loop • Syntax of do while loop Lab Session
14th week	**Chapter Five: Loops** • For loop • Syntax of for loop Examples of for loop

15th week	• Presentation • Practical Project Overview
16th week	Definition of final exam
Final Term Exam	

Computer Application

Subject Name	Computer Application
Subject Code	CS-CS-0103
Subject Status	Core
Credits	03
Course Objectives	-Give students an in-depth understanding of why computers are essential components in business, education and society. -Introduce the fundamentals of computing devices and reinforce computer vocabulary, particularly with respect to personal use of computer hardware and software, the Internet, networking and mobile computing. -Provide hands-on use of Microsoft Office 2019 applications Word, Excel, Access and PowerPoint.
Reference Books	a. Salam University Office Automation Videos recorded by the Instructors b. Microsoft Windows 11 out come 2023 c. Microsoft Word 2021 **by** Deitel, H.M
Weeks	**Topics**
1st week	• Introduction to Software and Applications • Types of Software o Application Software o System Software o Utility Software • Web Application • Desktop Application • Mobile Application • Introduction to Operating System o Definitions o Purposes of OS Basic of OS

2nd week	• Introduction to Windows Operating System
	  ○ Overview of Windows 11
	  ▪ Features
	  ▪ Editions
	  ▪ System requirements
	• Installing Windows 11
	  ○ Preparing to Install Windows 11
	  ○ Creating a Bootable Media
	  ○ Performing a Clean Installation of Windows 11
	  ○ Performing Image-based Installation of Windows 11
	Lab: Installing and Configuring Windows 11

3rd week	• Windows 11 Basics
	  ○ Starting Windows
	  ○ Windows Login Screen
	  ○ Introduction to the Desktop
	  ○ Introduction to Icons
	  ○ Working with Program Windows
	  ▪ Maximize
	  ▪ Minimize
	  ▪ Close
	  ○ Shutdown
	  ○ Restart
	  ○ Sleep
	Hibernate

4th week	• Using the Desktop
	  ○ Creating Folders
	  ○ Working with the Start Menu
	  ○ Using the Taskbar
	  ○ Managing Multiple Windows (Desktops - Task View)
	How to Customize the Taskbar

5th week	• File Management in Windows 11
	  ○ Working with Files and Folders
	  ○ Introduction to Files and Folders
	  ▪ Viewing Folders
	  ▪ Opening Folders and Files
	  ▪ Searching for Files and Folders
	  ▪ Creating and Renaming Folders
	  ▪ Selecting Files and Folders
	  ▪ Moving, Copying, and Deleting Files
	Using the Recycle Bin

6th week	• Windows 11 Settings o Introduction to Windows Settings and Control Panel o Personalizing Windows 11 ▪ Personalizing Background ▪ Modifying the Color Scheme Themes ▪ Lock Screen ▪ Customizing Taskbars ▪ Personalizing the Desktop o Display Settings ▪ Changing the Monitor Resolution ▪ Connecting to an External Display • Wireless Display • HDMI VGA
7th week	• Managing accounts in Windows 11 o Adding and Changing User Accounts o Switching between Users o Sign-in Options in Windows ▪ Password ▪ PIN ▪ Face Recognition ▪ Fingerprint ▪ Security Key ▪ Picture Password • Time and Language Settings o Date & Time o Language & Region o Adding and removing Typing Languages • Windows Fonts o Downloading and Installing Fonts • Exploring Print Features • Printing with Windows Adding a printer
8th week	• • Working with Application o Installing and Uninstalling Applications • Working on Internet o Types of Internet connections ▪ Ethernet connection ▪ WiFi Connection o Setting up Hotspot in windows 11 o Introduction to Microsoft Edge Browser • Security and Privacy in Windows 11 o Understanding security features Configuring Windows Security tools

Mid Term Exam	

9th week	Home Tab
	• Creating a Word Document & Editing a Word Document
	• Formatting Text in a Word Document
	• Change Font Styles
	• Highlight Text in a Document
	• Formatting Paragraphs in a Word Document
	  ○ Modify the Layout of a Paragraph
	  ○ Create Lists
	  ○ Apply Borders and Shading
	  ○ Apply Styles
	• Using Heading ins MS. Word
	• Find and Replace
	• Manage Formatting
	• Save, Open, Protect a document
	Saving file as PDF

10th week	Home Tab
	• Creating a Word Document & Editing a Word Document
	• Formatting Text in a Word Document
	• Change Font Styles
	• Highlight Text in a Document
	• Formatting Paragraphs in a Word Document
	  ○ Modify the Layout of a Paragraph
	  ○ Create Lists
	  ○ Apply Borders and Shading
	  ○ Apply Styles
	• Using Heading ins MS. Word
	• Find and Replace
	• Manage Formatting
	• Save, Open, Protect a document
	Saving file as PDF

11th week	Insert Tab
	• Insert Page and Page Break
	• Inserting Tables in a Word Document
	  ○ Create a Table
	  ○ Modify a Table
	  ○ Format a Table
	  ○ Convert Text to a Table
	  ○ Perform Calculations in a Table
	• Creating Customized Graphic Elements
	• Inserting Pictures
	  ○ Modifying Pictures
	  ○ Resize a Picture
	  ○ Adjust the Picture Appearance Settings
	Wrap Text Around a Picture

12th week	Insert Tab cont. • Draw Shapes • Create Complex Illustrations with Charts and SmartArt • Insert and Format Screenshots in a Document • Insert Symbols and Special Characters • Create Text Boxes • Inserting Content Using Quick Parts • Insert Building Blocks • Insert Fields Using Quick Parts • Inserting Header and Footers • Add WordArt and Other Special Effects to Text • Inserting Special Characters and Graphical Objects Inserting Equations
13th week	• Layout Tab o Margin o Orientation o Page Size o Columns o Breaks • Reference Tab o Creating Table of Contents o Footnote and End note o Citation and Biography o Insert Caption • Review Tab o Comments Track Changes
14th week	• MS PowerPoint o Introduction to PowerPoint Home tab and slide layout • MS PowerPoint cont. o Working with translations o Working with animations o Working with slideshow Creating a presentation
15th week	• MS Excel o Introduction to Excel o Data Entry and Cell Formatting Working with Multiple Sheets
16th week	• MS Excel cont. o Basic Formulas and Functions ▪ SUM, Average, Max, Min, If o Data Sorting and Filtering o Charts and Graphs o Conditional Formatting o Pivot Tables Practical Project in MS Excel

Final Term Exam

General Mathematics

Subject Name	General Mathematics
Subject Code	CS-CS-0104
Subject Status	Core
Credits	03
Course Objectives	Mathematics makes our life orderly and prevents chaos. The aims of teaching and learning mathematics are to encourage and enable students to: recognize that mathematics permeates the world around us. Develop the knowledge, skills and attitudes necessary to pursue further studies in mathematics.
Reference Books	Mathematics (Algebra and Trigonometry), Statistics
Weeks	**Topics**
1st week	Introduction Sets and Numbering Systems
2nd week	Function and Quadratics
3rd week	Function and Quadratics (cont...)
4th week	Matrices and Determinants
5th week	Sequence and Series
6th week	Sequence and series (con…)
7th week	Binomial theorem Coordinate Geometry
8th week	Trigonometry
Mid Term Exam	
9th week	Trigonometry (cont…)
10th week	Trigonometry (cont…)
11th week	Statistics
12th week	Statistics
13th week	Representation of Data
14th week	Skewness and Kurtosis
15th week	Measures of Central Tendency
16th week	Probability Concepts
Final Term Exam	

Functional English-I

Subject Name	Functional English-I
Subject Code	CS-CS-0105
Subject Status	Core
Credits	03
Course Objectives	In this subject the basic Grammar structure and the reading Section of the course is covered. In first part the students are introduced to Tenses, Grammatical structures, Sentence Structure, etc. and after that the reading section is covered. Hence the students will become able to read any computer science books and get help from them. The main activities are given below:
Reference Books	a. High School English by Wren and Morton b. Azar Black, Fourth Edition, (SchrampherAzar)
Weeks	**Topics**
1st week	English grammar part-i Introduction What is sentence Types of sentence
2nd week	Subject and predicate Phrase and clause SENTENCES (overview) Present tense Past tense Future tense
3rd week	Noun Common /proper noun Collective noun Abstract noun Countable /uncountable The noun gender
4th week	The noun number The noun case ADJECTIVE Adjective of quality Adjective of quantity Adjective of number
5th week	Distributive numeral adjective Demonstrative adjectives Interrogative adjectives ARTICLES Indefinite article

6th week	Definite article PRONOUNS Personal pronoun Forms of personal pronouns Reflexive and emphatic pronouns
7th week	Demonstrative /indefinite/distributive pronouns VERB
8th week	Transitive/intransitive Weak /strong verb
Mid Term Exam	
9th week	The verb person and number Infinitive
10th week	Adverb Types Adverb of time
11th week	Adverb of frequency Adverb of place
12th week	Adverb of manner Adverb of degree/quantity
13th week	Adverb of reason/affirmation/negation Preposition Conjunction
14th week	Interjection Spelling rules
15th week	English Reading Part-II
16th week	Reading
Final Term Exam	

ثقافت اسلامی 1 (جهان بینی اسلامی)

Subject Name	ثقافت اسلامی 1 (جهان بینی اسلام)
Subject Code	CS-CS-0107
Subject Status	Inclusive
Credits	01
Course Objectives	1. شناخت محصل از دین مبین اسلام. 2. شناخت محصل از عقاید اسلامي.
Reference Books	1 – از سور الفیل تا سوره الناس حفظ با تجوید. ۲- مطالعه و خلاصه نمودن کتاب: مبادی اسلام از امام سید ابوالاعلی مودودی
Weeks	**Topics**
1st week	تعریف ثقافت اسلامی منابع ثقافت اسلامی، اهداف ثقافت اسلامی
2nd week	تعریف جهان بینی وجهان بینی اسلامی، برتریت جهان بینی اسلامی، موضوعات جهان بینی اسلامی.
3rd week	تعریف ایمان و مؤمن واسلام و مسلمان، رابطه اسلام و ایمان، ارکان ایمان (ایمان بالله، تعریف توحید وانواع توحید)
4th week	ایمان به فرشتگان و ایمان به پیامبران
5th week	ایمان به کتب اسمانی وایمان به روز قیامت
6th week	ایمان به قضا وقدر، فلسفه و حکمت عقیدة قضا وقدر
7th week	نواقض ایمان (کفروانواع آن، ردت واسباب آن، نفاق وانواع آن)(تعریف کافر، مشرک، مرتد، منافق)
8th week	شرک وانواع آن، مبارزه وپیکاراسلام به ضد شرک،نقش ایمان در زندگی.
Mid Term Exam	
9th week	بیان واژه ها(کرامت،وحی، استدراج،نمونه های کرامت در قران وسنت)
10th week	بیان واژه ها(شفاعت، اقسام وشروط آن ، توسل وانواع آن اسباب توسل شروع.
11th week	انسان شناسی (انسان ازنگاه ماتریالیزم،ایدیالیزم واسلام، خلقت انسان در نگرش اسلامی،خلیفه بودن انسان)
12th week	1کرامت انسانی، برتریت انسان بر مخلوقات دیگر، مسؤلیت ها ومکلفیت های انسان دراسلام (معرفت،عبادت،اعمارزمین واقامه شریعت الهی)
13th week	طبیعت وجهان (نظریه تصادف،نظریه مادی، طبیعت از دیدگاه اسلام)
14th week	نگاه اسلام به دنیا،دنیا وسیله است، دنیا هدف است
15th week	مراجعه وتکرار درسهای قبلی
16th week	بیان واژه ها(کرامت،وحی، استدراج،نمونه های کرامت در قران وسنت)
Final Term Exam	

History

Subject Name	History
Subject Code	CS-CS-0106
Subject Status	Inclusive
Credits	02
Course Objectives	کتاب: تاریخ معاصر افغانستان نویسنده: خلیل احمد جامی
Reference Books	1- اهداف در زمینهٔ دانش. - شناخت کلی دانش آموزان از تحولات تاریخی سرزمین خویش ، چگونگی به قدرت رسیدن ، شیوه حکومت، نوع حکومت وروابط زمامداران افغان با ملل دیگر . - اهداف در زمینهٔ مهارتها. - بلند بردن سطح تحلیل محصلان دررابطه به تحولات تاریخی کشور، ایجاد فهم علمی ودیدگاه علمی در دررابطه به تحولات تاریخی کشور .
Weeks	**Topics**
1st week	تعریف، جغرافیای موجوده ، ونام های تاریخ
2nd week	هوتکیان
3rd week	نادرافشار وافغانستان
4th week	ابدالیان افغانستان
5th week	سلطنت تیمور شاه
6th week	سلطنت زمان شاه
7th week	سلطنت شاه محمود ، شاه شجاع وبار دوم شاه محمود
8th week	محمد زائیان
Mid Term Exam	
9th week	جنگ اول افغان وانگلیس
10th week	سلطنت امیر شیر علی خان بار اول ودوم وامیر محمد یعقوب خان
11th week	سلطنت امیر عبدالرحمن خان
12th week	سلطنت امیر حبیب الله خان
13th week	سلطنت امیر امان الله
14th week	سلطنت حبیب الله کلکانی
15th week	سلطنت محمد نادرخان
16th week	محمد ظاهر شاه
Final Term Exam	

Second Semester Course Outlines

Second Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Programming Concepts	CS-CS-0208	3	1	4	5	Professional	CS-CS-0102
2	E-Commerce	CS-CS-0209	3	1	4	5	Core	CS-CS-0101
3	Electronic Physics	CS-CS-0210	2	2	0	2	Core	NIL
4	Web Design -I	CS-CS-0211	3	1	4	5	Professional	NIL
5	Functional English-II	CS-CS-0205	3	3	0	3	Core	CS-CS-0105
6	Environmental Protection	CS-CS-0212	2	2	0	2	Inclusive	NIL
7	Islamic Study-II	CS-CS-0207	1	1	0	1	Inclusive	CS-CS-0107
	Total		17	11	12	23		

Programming Concepts

Subject Name	Programming Concepts
Subject Code	CS-CS-0208
Subject Status	Professional
Credits	03
Course Objectives	This course would help the students to develop programming language skills using C++. By the end of this module the students should be able to know what is involved in creating a fully functional program. also this course is intended to give the students a grounding in object-oriented paradigm completing this course, the students would be acquainted with some of the underlying concepts of object-orientation and would be able to develop small object-oriented applications
Reference Books	a. Robert Lafore, Object Oriented programming in C++ b. Deitel&Deitel, C++ How to Program.
Weeks	**Topics**
1st week	• Defining Array • Why Array • How to Use Array • How to Declare Array • How to initialize array • How to access array elements? • Practice session

2nd week	**Chapter One: Arrays** • One dimensional Array • Declaration of one-dimension array • Display data form one-dimension array Loop through array • Two-Dimensional Array • Character Array • Declaration of two-dimension array • Loop through two dimensional array
3rd week	**Chapter Two: Introducing Functions** • Overview of the functions • How to use functions • Why Functions • Lab Session
4th week	**Chapter Two: Introducing Functions** • How to use Functions • Function Prototype • Function Definition • Function Calling
5th week	Chapter Two: Types of Functions • Built-in Functions • User Defined Functions • Passing Argument to Functions • Pass by value mechanism • Pass by address mechanism • Practice Session
6th week	Chapter Two: Introducing Functions • Why use inline functions • How to use inline functions • When to use inline functions • Lab session
7th week	Chapter Three: Introducing Pointers • Defining Pointers • Why Pointers • Declaring Pointers • Initializing Pointers • Practice Session
8th week	**Chapter Four: Structure** • Introduction to structure • Why needs structure • A simple structure • Declaring structure Syntax of the structure declaration
Mid Term Exam	

9th week	Chapter Four: Structure • Use of the structure declaration • Defining a structure variable • Accessing structure members • How to access structure members? • Practice
10th week	**Chapter Five: Enumeration** • What is enumeration • How to create Enum • Usage of enumeration Examples

11th week	Chapter Six: File Handling
	• Classes for File stream operations
	  ○ ios
	  ○ istream
	  ○ ostream
	  ○ streambuf
	  ○ fstreambase
	  ○ ifstream
	  • ofstream

12th week	Chapter Six: File Handling • Creation of a new file • Opening an existing file • Reading from file • Writing to a file • Moving to a specific location in a file • Closing a file
13th week	Working on project to implement the above-mentioned concepts
14th week	Working on project to implement the above-mentioned concepts
15th week	Working on project to implement the above-mentioned concepts
16th week	Presentation
Final Term Exam	

Electronic Physics

Subject Name	Electronic Physics
Subject Code	CS-CS-0210
Subject Status	Core
Credits	02
Course Objectives	This course would help the students to develop programming language skills using C++. By the end of this module the students should be able to know what is involved in creating a fully functional program. also this course is intended to give the students a grounding in object-oriented paradigm completing this course, the students would be acquainted with some of the underlying concepts of object-orientation and would be able to develop small object-oriented applications
Reference Books	a. Halliday, D., Resnick, R., & Walker, J., b. Fundamentals of Physics extended, 5th Edition, John Wiley & Sons, New York, 1997.
Weeks	**Topics**
1st week	Electrostatics Coulomb's Law Coulomb's Law and its experimental verification
2nd week	Electric Charge Charge quantized Electric fields, Electric Field Intensity
3rd week	Electric Potential, Electric Potential Energy, Potential Difference Flux of electric field,
4th week	Gausses law and its application Capacitors and dielectrics
5th week	Capacitance Capacity of a spherical and parallel plate capacitor, polarization of matter
6th week	Gausses law in dielectrics,
7th week	Energy density of electrostatic field
8th week	Electric Current and Magnetic Fields
Mid Term Exam	
9th week	Current and magnetic field, electric current, Ohm's law
10th week	Equation of continuity Field due to a current interaction of magnetic field with current
11th week	Field due to a straight and circular current Ampere's law, Ampere's circuital theorem
12th week	Fields due to a solenoid and a toroid, Pelter and Thomson's effect, total e.m.f in thermocouple
13th week	Faraday's law, Faraday's law of electromagnetic induction and its Differential form

14th week	Self induction, self inductance of a toroidal solenoid, Mutual inductance of toroidal solenoid
15th week	Magnetic fields in matter-I, magnetization vector, the magnetic intensity
16th week	Vector H Magnetic energy, dia, para and ferro magnetism phlegmatic hysteresis
Final Term Exam	

Functional English-II

Subject Name	Functional English-II
Subject Code	CS-CS-0205
Subject Status	Core
Credits	02
Course Objectives	Linear algebra is a field of mathematics that could be called the mathematics of data. It is undeniably a pillar of the field of machine learning and many recommend it as a prerequisite subject to study prior to getting started in machine learning.
Reference Books	a. English Grammar in Use b. Fundamentals of English Grammar, Azar Black c. Practical English Grammar
Weeks	**Topics**
1st week	What is Grammar? Tenses Verb Tenses
2nd week	Present Tense, Simple Present Tense, Structures & Usages Present Continuous Tense, Structures & Usages
3rd week	Present Perfect Tense, Structures & Usages Present Perfect Continuous Tense, Structures & Usages
4th week	Past Tense, Simple Past Tense, Structures & Usages Past Continuous Tense, Structures & Usages Past Perfect Tense, Structures & Usages Past Perfect Continuous Tense, Structures & Usages
5th week	Future Tense, Simple Future Tense, Structures & Usages Future Continuous Tense, Structures & Usages Future Perfect Tense, Structures & Usages Future Perfect Continuous Tense, Structures & Usages
6th week	Auxiliaries and Modals: Must , Have to, Have Got To Ought To, Had Better
7th week	Can, Could, May, Might, Shall
8th week	Should, Will, Would, Used to, Need, Dare
Mid Term Exam	

9th week	Articles (a, an and the)
10th week	What is writing? The process of writing? Invention (Prewriting)
11th week	Drafting Revising Proofreading and Editing Sentence Components of sentence
12th week	Subject, Predicate, Direct Objects, Indirect Objects, Parts of sentence, Kinds of sentence
13th week	Declarative sentence Interrogative sentence Imperative sentence Exclamatory sentence
14th week	Optative sentence Kinds of sentence according to the structure Simple sentence Compound sentence
15th week	Complex sentence Compound complex sentence
16th week	Side Activities: Conversation Dialogues, Reading Passages, Listening Comprehension
Final Term Exam	

E-Commerce

Subject Name	E-Commerce
Subject Code	CS-CS-0209
Subject Status	Core
Credits	03
Course Objectives	Outline a basic model of the internet technology infrastructure Assess e-commerce strategies and applications, including online marketing, e-government, e-learning and global e-commerce Discuss the significance of Web 2.0 content and social networks in e-commerce
Reference Books	a. EffrainTurnban, Jae Lee, e-Commerce A Managerial Perspective b. Ravi KaIakota, Andrew B. Whinston, Electronic Commerce A Manager's Guide
Weeks	**Topics**
1st week	Networks and their Types, Internet, Web, webpages E-Commerce Definitions, E-Business vs E-commerce

2nd week	Unique Features of E-commerce, Ubiquity, Global Reach, Information Richness, Universal Standards, Interactivity, Information Density, Personalization and Customization
3rd week	• Types of E-commerce: B2B, B2C and C2C Origin and Growth of E-commerce, Potential limitation on growth of E-commerce
4th week	Early visions of E-commerce, Benefits of EC to Organization, Benefits to Customer, Benefits to Society
5th week	• Technical Limitations, Predictions for the Future, EC organizing themes, Academic disciplines concern to E-commerce,
6th week	Business Plan and Business Model, E-commerce Business Models, Key ingredients of a Business Model
7th week	Value proposition, Revenue Model, market opportunity, competitive environment, competitive advantage
8th week	Market Strategy, Organizational development, Management Team
Mid Term Exam	
9th week	Raising Capital, Categorizing E-commerce Business Models
10th week	• B2C Models: E-tailer, community provider, content provider, portal Transaction broker, market creator, service provider
11th week	EDI, Gold Rush Model, B2B Models: E-distributor, E-procurement, Exchange, Industry Consortium, Private Industrial Networks
12th week	Peer to peer, consumer to consumer, M-Commerce, E-commerce Enablers
13th week	How E-commerce changes Business Strategy, Structure and Process
14th week	Industry Value Chains, Firm Value Chains, Firm Value Webs
15th week	Building an E-commerce presence, Web sites and Apps, Conducting SWOT Analysis, SDLC, Implementing and Maintenance.
16th week	Raising Capital, Categorizing E-commerce Business Models
Final Term Exam	

Web Fundamentals-I

Subject Name	Web Fundamentals I
Subject Code	CS-CS-0211
Subject Status	Professional
Credits	03

Course Objectives	• This course provides students with a solid foundation in web design and development, focusing on both the technical and creative aspects of building websites. Students will learn HTML to structure content, CSS to style and layout pages, and introductory JavaScript to add basic interactivity. Emphasis will be placed on building responsive, user-friendly websites that adapt to different screen sizes and devices, utilizing modern techniques such as Flexbox and media queries.
Reference Books	a. Thomas A. Powel , HTML the Complete Reference, McGraw Hill b. Danny Goodman, JavaScript Handbook, IDG books
Weeks	**Topics**
1st week	**Introduction to Web Design & Development** • Overview of Web Technologies • History & Evolution of the Web • Web Design vs Web Development • Internet Basics: WWW, HTTP/HTTPS, Client-Server Model • Overview of Front-End & Back-End
2nd week	**Web Ecosystem & Tools** • Introduction to Browsers, Web Servers, Hosting • Domain Names, URLs • Setting Up Development Environment
3rd week	**HTML Basics - Structure & Tags** • Document Structure: `<!DOCTYPE>`, `<html>`, `<head>`, `<body>` • Headings, Paragraphs, Line Breaks • Bold, Italic, Underline, Comments
4th week	**HTML Lists, Links & Images** • Ordered & Unordered Lists • Hyperlinks & Anchor Tags • Image Tag and Attributes • Relative vs Absolute Paths
5th week	**HTML Tables & Forms** • Table Structure: Rows, Columns, Headers • Form Elements: Input, Button, Textarea, Select, Radio, Checkbox • Form Attributes: Action, Method
6th week	**HTML Multimedia & Semantic Tags** • Audio & Video Tags • Embedding YouTube, Google Maps • Semantic Elements: `<article>`, `<section>`, `<nav>`, `<footer>`
7th week	Introduction to CSS - Basics • What is CSS? • Types of CSS: Inline, Internal, External • Syntax, Selectors, Properties • Adding CSS to HTML
8th week	**CSS Text & Color Styling** • Fonts, Text Alignment, Colors, Background Colors, Hex & RGB Colors
Mid Term Exam	

9th week	Mid Term Exam • CSS Box Model & Borders • Margin, Padding, Borders Width & Height
10th week	**CSS Positioning & Layouts** • Static, Relative, Absolute, Fixed Positioning • Display Property, Inline/Block Elements
11th week	**CSS Flexbox Introduction** • Flex Container, Items, Justify-Content, Align-Items
12th week	Responsive Web Design Basics • Media Queries Introduction • Mobile-First Design
13th week	CSS Revision & Advanced Practices • CSS Transitions/Animations (Optional Intro) •CSS Review and Q&A Session
14th week	Introduction to JavaScript • Role of JS in Web • Adding JS to HTML, Basic Syntax
15th week	Variables, Data Types, Operators
16th week	Mini HTML and CSS Project Build a basic multipage website (e.g., Personal Portfolio or Simple Business Site)
Final Term Exam	

مفردات مضمون: ثقافت اسلامی 2 (عبادات وحکمت های آن)

Subject Name	مفردات مضمون: ثقافت اسلامی 2 (عبادات وحکمت های آن)
Subject Code	CS-CS-0207
Subject Status	Inclusive
Credits	01
Course Objectives	کتاب مقرر : عبادات و حکمت های آن (چپتر) تالیف :دکتور عبدالله نور عباد و مظهرالدین فایز
Reference Books	1. شناخت محصل از شمول عبادت در تمام عرصه های زنده گی 2. شناخت محصل ار عبادات وحکمت هاي آن
Weeks	**Topics**

1st week	مفهوم عبادت وابعاد ان 1. تعریف عبادت 2. شروط عبادت 3. نیاز انسان به عبادت 4. اهداف عبادت
2nd week	ارتباط عبادت با ایمان واخلاق 1. ارتباط عبادات با اصل ایمانی وروش های اخلاقی 2. تقوی وارتباط آن با عبادات وارزشهای اخلاقی 3. خود داری از رذایل اخلاقی درعبادات 4. عوامل تقویه ارزشهای اخلاقی با عبادات
3rd week	ویژگیهای عبادت دراسلام 1. عبادت زبانی 2. عبادت مخلصانه(اخلاص درعبادت) 3. عدم وساطت درعبادت 4. شمولیت و استمرار در عبادت 5. توقیفی بودن عبادت 6. عبادت مطابق توانائی انسان انواع عبادت و شمول و فراگیری آن در اسلام عبادت بدنی (عبادت قلب،زبان ،گوش،چشم، حس ذائقه،عبادت دست وپا) عبادت مالی (زکات، صدقه فطر، صدقات نافله.....) عبادت مشترک بدنی ومالی (حج،جهاد.....)همه اعمال خیر وترک نواهی عبادت است
4th week	کلمه توحید وحکمتهای ان 1. ارکان کلمه توحید 2. فضیلت کلمه توحید 3. نواقص کلمه توحید 4. مقتضیات کلمه توحید 5. نقش کلمه توحید درعبادت
5th week	نماز وحکمت های آن 1. تعریف نماز 2. حکم نماز (مشروعیت نماز) 3. شروط نماز شروط نماز 1- شروط وجوب 2- فرائض نماز الف: فرائض خارجی نماز (شروط). ب: فرائض داخلی نماز (ارکان). 3- واجبات نماز 4- مفسدات نماز 5- فضائل نماز

6th week	اقسام نماز 1- نماز های فرضی 2- نمازهای پنجگانه 3- نماز جمعه 4- نمازجنازه نمازهای واجب 1- وتر 2- نماز عیدین نمازهای سنت 1- سنت های رواتب(توکد) 2- نماز کسوف وخسوف 3- نماز استسقاء 4- نماز تراویح 5- نمازهای نوافل الف: نوافل عام ب: نماز تهجد، نماز ضحی،تحیة المسجد، نماز استخاره، صلاه حاجت
7th week	نماز جماعت: 1. حکم نماز جماعت 2. فضیلت نماز جماعت 3. آداب نماز جماعت 4. حکمتهای وفواید نماز. 5. حکم تارک نماز
8th week	معنی ومفهوم زکات 1- تعریف لغوی واصطلاحی زکات 2- حکم زکات ودلائل فرضیت آن از قران ،سنت واجماع 3- فضائل زکات 4- گواهی دیگران برنقش زکات 5- شروط وجوب زکات 6- اموال زکات و نصاب زکات 7- مستحقین زکات
Mid Term Exam	
9th week	برخی از حکمتهای زکات 1- حکمتهای دینی زکات 2- حکمتهای تربیتی زکات 3- حکمتهای اجتماعی زکات 4- تحذیر از ادا نکردن زکات حکم ما نعین زکات 1- نقش دولت درجمع آوری زکات، فرق بین تکس وزکات

10th week	روزه حکمتهای آن 1- تعریف لغوی واصطلاحی روزه. 2- معنا ومفهوم رمضان 3- حکم روزه ماه رمضان ودلایل فرضیت آن فضیلت ماه رمضان وروزه 1- احکام روزه 2- شروط وجوب روزه 3- شروط صحت ادای روزه 4- مستبحات روزه 5- مفسدات روزه 6- کفاره روزه
11th week	حکمتهای روزه 1- روزه حقیقی 2- اهداف روزه حکمتهای روزه 1- روزه عامل تقویه روح 2- روزه باعث سلامتی بدن 3- روزه عامل پرورش وتقویه اراده 4- روزه عامل شناخت نعمت های الهی 5- روزه عامل یاد آوری محرومان 6- حکم تارک روزه رمضان
12th week	حج 1- تعریف لغوی واصطلاح حج 2- حکم حج ودلایل فرضیت آن 3- انواع حج (حج قران،حج تمتع، حج مفرد) 4- احکام حج 5- شروط وجوب حج 6- شروط صحت اداء حج ارکان (فرائض) حج 1- واجبات حج 2- سنت های حج 3- محرمات وممنوعات حج 4- مبطلات یا مفسدات حج 5- فضایل حج وعمره
13th week	عمره ،تعریف عمره، حکم عمره، فضیلت عمره، اعمال عمره، حکمتهای حج، کعبه رمز توحید ویگانگی، حج منبع نیروی معنوی وعاطفی است، حکم تارک حج
14th week	بدعت وپیامدهای زشت آن، تعریف لغوی واصطلاحی بدعت، حکم بدعت ودلایل تحریم آن، انواع بدعت، اسباب انشار بدعت، پیامدها وضررهای بدعت،چگونگی اصلاح بدعت
15th week	تنبلی وکسالت درعبادت ، اسباب کسالت درعبات
16th week	2- علاج کسالت وتنبلی درعبادت

Final Term Exam

Third Semester Course Outlines

Third Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Discrete Mathematics	CS-CS-0313	3	3	0	3	Core	NIL
2	Object Oriented Programming	CS-CS-0314	3	1	4	5	Professional	CS-CS-0208
3	Introduction to Network	CS-CS-0315	3	1	4	5	Core	CS-CS-0101
4	Web Fundamentals-II	CS-CS-0311	3	1	4	5	Professional	CS-CS-0211
5	English Composition	CS-CS-305	2	2	0	2	Core	CS-CS-0205
6	Database Concepts	CS-CS-0316	3	2	2	5	Core	NIL
7	Islamic Studies-III	CS-CS-0307	1	1	0	1	Inclusive	CS-CS-0207
	Total		18	11	14	26		

Discrete Mathematics

Subject Name	Discrete Mathematics
Subject Code	CS-CS-0313
Subject Status	Core
Credits	03
Course Objectives	By using Logic, Recursion, Sets, Counting and Probability a major purpose of the course is to present material in a precise and readable manner with the concepts and techniques of discrete objects—Objects consisting of distinct of unconnected elements. Thought this course the student will develop mathematical maturity; it will develop their ability to understand and create mathematical arguments. Students will learn particular set of mathematical facts and how to apply them
Reference Books	a. Discrete Mathematics for computing by Peter Grossman b. Discrete Mathematics Structure with Application to computer science by Trembaly ,R.Manohar
Weeks	**Topics**

1st week	Advanced Sets Introduction, Sets & Elements, Universal & Empty Set Subset, Venn Diagram,
2nd week	Set Operation, Finite and infinite Set,
3rd week	Power Set, Numbers Set Venn Diagram
4th week	Relation Introduction, graph of relation Doman & Range ,Matrix relation, Invers Relation
5th week	Reflexes ,Symmetric, Ant symmetric, Composition of relation Closure properties, Complement Relation
6th week	Function Introduction, Domain, Ring, Co-Domain, one-two one function Onto Function , Bijective Function, Function and Relation
7th week	Mathematical function, Composition function Invers, operation on Function, Functional statement ,Quantifier logic
8th week	Logic Introduction, Proposition Basic Logical operation, Conditional statement
Mid Term Exam	
9th week	Exam
10th week	Truth table, tautology, Logical Equivalents Swatch, Secrete, AND, OR, NOT, NAND, NOR, XOR, NXOR
11th week	Boolean Algebra, Function on Boolean Algebra
12th week	Graph Theory Introduction, Multigraph, Sub graph Degree of Vertexes
13th week	Paths connectivity, Euler Path, the bridge of Konigsberg
14th week	Complete, Regular graph Tree graph, Isomorphic

15th week	Tree Spanning Tree, Example, Question
16th week	Minimal Spanning Tree Different Example and questions
Final Term Exam	

Object Oriented Programming

Subject Name	Object Oriented Programming
Subject Code	CS-CS-0314
Subject Status	Professional
Credits	03
Course Objectives	This course would help the students to develop programming language skills using Java. By the end of this module the students should be able to know what is involved it creating a fully functional program be able to design and develop a small application, also this course is intended to give the students grounding in object oriented paradigm. After completing this completing this course, the students would be acquainted with some of the underling-concepts of object-orientation and would be able to develop small object-oriented applications.
Reference Books	a. Robert lafore, Object Oriented programming in C++ b. Deitel&Deitel, C++ How to Program.
Weeks	**Topics**
1st week	1. Programming languages Object-Oriented Programming Concepts
2nd week	1. Introduction to Java Setup the environment to run java
3rd week	1. Java First Program 2. Java Variables 3. Java Data Types
4th week	1. Operators a. Unary b. Arithmetic c. Ternary (Conditional) d. Assignment e. Equality f. Relational g. Logical 2. Expressions Statements
5th week	Control Statements Part one (Conditional Statements) a. if statement b. if ---- else statement c. If ---- else if statements d. Nested if statements Switch statements

6th week	Control Statement Part two (Loops) a. for loops I. simple II. enhanced b. while do-while
7th week	Introduction to class and object a. Definition of class Creating object of the class
8th week	1. Class 1. Object Method
Mid Term Exam	
9th week	Inheritance
10th week	Encapsulation
11th week	Polymorphism
12th week	Abstract classes
13th week	Interfaces
14th week	Exception Handling
15th week	Characters and Strings
16th week	Java Collection Frramwork
Final Term Exam	

Database Concepts

Subject Name	Database Concepts
Subject Code	CS-CS-0316
Subject Status	Core
Credits	03
Course Objectives	This course introduces the basic concepts of data management and guides towards the concepts of its application. The course emphasizes on relational data base. The course introduces normalization and other topics like ER model Data, Integrity, security, cuncuiel1cy a recovery and recovery techniques. The course also introduces the basics 0 SQL.
Reference Books	a. Jeffery A. Hoffer,MaryB.Prescott, fredR,Modern database management b. Thomas P.Connoli, database management systems. c. Al stevens, C Database Development . d. Claire Rajan ,Oracle 10g Database Administrator 1 & 2

Weeks	Topics
1st week	• Introduction to Database and course evaluation • Importance of Databases • Data and its types • Information Data Vs information
2nd week	The Database Environment and Development Process
3rd week	• DBMS, RDBMS, etc • File processing system Advantages and disadvantages of file processing system
4th week	• Modeling Data in Organization • Database model • Database modeling • Data model • Types of Data models E-R data model
5th week	• Major components of E-R model • Entities • Types of Entities • Entity instance Symbol for entities
6th week	• Relationships • Degree of a Relationship (Unary Relationship, Binary Relationship and • Ternary Relationship) One to one, one to many, many to many
7th week	• Enhanced Entity relationship data model (EERD) • Super type- subtype • Generalization- specialization • Specifying constraints • Completeness constraints and types Disjoint constraints and types
8th week	• Introduction to constraints Types of Constraints(Domain, Not null, Check, Primary key, Recreational integrity, Default).
Mid Term Exam	
9th week	**امتحان وسط سمستر**
10th week	Introduction to SQL • Type of RDBMS and MySQL Creation of database and tables

11th week	Data Definition Languages in MySQL • Create commands • Alter commands Drop commands
12th week	Introduction to Keys Types of key Super key Primary key Alternate key Foreign key Candidate key
13th week	• Anomalies and Normalization Functional dependency introduction and usages
14th week	• First Normal Form with example Second normal form with example
15th week	• Third normal form with example • BCNF introduction and example • Case studies for practice Project presentation
16th week	Case studies for practice Students Project presentation
Final Term Exam	

Introduction to Network

Subject Name	Introduction to Network
Subject Code	CS-CS-0315
Subject Status	Core
Credits	03
Course Objectives	This course has the main theme to introduce students to the concept of computer Network, Network Layers, Network models (OSI & TCP/IP) and Protocol standards. Emphasis is given on the understanding of modern network concepts.
Reference Books	a. Data Communication & Networking, latest Edition by Behrouz A. Forouzan b. Computer Network, Fourth Edition by Anderw S. Tenanbaum
Weeks	**Topics**
1st week	Introduction to Networking
2nd week	Network Categories (LAN, MAN, WAN)
3rd week	Network Types (P2P, Client-Server)
4th week	OSI Layers
5th week	TCP/IP Layers

6th week	Topologies & Network Devices
7th week	IP Addressing (Class A & B)
8th week	IP Classes (C–E), IPv6
Mid Term Exam	
9th week	Transmission Media
10th week	Ethernet & MAC Addressing
11th week	Conventional Ethernet Types
12th week	Giga & 10-Gigabit Ethernet
13th week	Multiplexing (FDM)
14th week	TDM, CDM, TCP/IP Suite
15th week	Routing & ATM Concepts
16th week	Final Exam
Final Term Exam	

Web Fundamentals-II

Subject Name	Web Fundamentals II
Subject Code	CS-CS-0311
Subject Status	Professional
Credits	03
Course Objectives	Web designing is an Art. It has become more popular than before. Now-a day's everyone is creating their own websites for professional and personal use. This course focuses on core designing language which is JavaScript. We will also learn JQuery (a library of JavaScript).
Reference Books	c. JavaScript and JQuery: Interactive Front-End Web Development, by Jon Duckett
Weeks	**Topics**
1st week	Introduction to the course. • Introduction to JavaScript and jQuery. Introduction to Bootstrap.
2nd week	• Bootstrap grid systems. • Bootstrap default settings. Bootstrap tables.
3rd week	• Bootstrap images, jumbotron, wells, alerts, and buttons. Glyph icons, paginations, pager.

4th week	• JS introduction. • JS syntax, output, statements, comments. Where to put JS code.
5th week	• Variables. • Events. • JS operators: • Arithmetic operators. • Assignment operators. • Comparison operators. Logical operators
6th week	Functions, objects, and its scope
7th week	String, Array, Date, Math.
8th week	• Data types, if…else, for, while, do-while JavaScript Hoisting, this keyword, arrow function
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	Classes, Modules, JSON
11th week	• JS HTML DOM. • DOM methods. DOM events.
12th week	• JQuery syntax, selectors and events. • JQuery Effects: • Hide/show • Fade • Slide Animate
13th week	• JQuery Effects: • Stop • Callback • Chaining • JQuery HTML • JQuery get JQuery set
14th week	• JQuery add • Query remove • JQuery CSS classes • JQuery css() JQuery dimensions
15th week	• JQuery traversing JQuery ancestors, descendants, siblings, and filtering

16th week	• JQuery Ajax introduction • JQuery load a. JQuery get/post
Final Term Exam	

English Composition

Subject Name	English Composition
Subject Code	CS-CS-0305
Subject Status	Core
Credits	02
Course Objectives	To develop better reading skills(Verbal and Non-verbal) To enhance the abilities of understanding grammar reading segments. To bring up better comprehension of reading passages. To develop self-study habits. To build strong self-confidence of learning English Language.
Reference Books	d. Longman, Cambridge University press e. High School Grammar & composition, Wren & Martin
Weeks	**Topics**
1st week	Introduction to reading strategies. • The most popular sport in the world • Discussion • Presenting main idea Write a relevant topic.
2nd week	Exercises Discussion and writing Learning vocabulary Are you healthy eater? Discussion Learning vocabulary
3rd week	Exercises Exercises Learning vocabulary Dream house Video Practices
4th week	Exercise Discussion Learning vocabulary Shake hands Discussion Main idea Relevant topic
5th week	Exercises exercises presentation Quiz Class evaluation

6th week	A city without oil Discussion Main idea Presentation Exercise presentation
7th week	You cannot please everyone Discussion Main idea Learning vocabulary Exercises exercise
8th week	Discussion and writing. Discussion and writing Indefinite pronouns Grammar day
Mid Term Exam	
9th week	Across the desert. Before you read Learning vocabulary Exercises Writing a relevant topic
10th week	Vocabulary explanation Verb forms Vocabulary in context Reading quiz Reading games Students, assignment and presentations will be observed.
11th week	Denmark loves bicycles Discussion Topic Exercises Discussion and Writing
12th week	Grammar day Suffixes and prefixes Grammar day Words formation
13th week	A passion for cooking Vocabulary Exercises Pages: 52,53 & 54 Presentation Learning vocabulary

14th week	Travel more, spend less. Page: 55 Before you read Exercise Pages: 58, 59 Presentation Discussion and writing
15th week	A very able man Page: 61 & 62 Discussion Before you read Exercises Pages: 64, 65 & 66
16th week	Before you read Protecting cultural traditions Pages: 68,69 & 70 Exercises Pages: 70 ,71 & 72 Understanding the text Discussion and writing
Final Term Exam	

مفردات مضمون: ثقافت اسلامی 3 (نظام اخلاقی اسلام)

Subject Name	مفردات مضمون: ثقافت اسلامی 3 (نظام اخلاقی اسلام)
Subject Code	CS-CS-0307
Subject Status	Inclusive
Credits	01
Course Objectives	1. شناخت محصل از دین مبین اسلام. 2. شناخت محصل از اخلاق اسلامي.
Reference Books	کتاب مقرر : درآمدی بر نظام اخلاقی اسلام (کتاب) تالیف :دکتور عبدالصبور فخری
Weeks	**Topics**
1st week	تعریفات اخلاق، ویژگیهای نظام اخلاقی اسلام
2nd week	انواع اخلاق: نیک وبد، فطری واکتسابی، عام انسانی وخاص اسلامی
3rd week	منابع وریشه های اخلاق اسلامی
4th week	اهداف آموزش اخلاق، جایگاه وفضیلت اخلاق در اسلام
5th week	ارزشهای های اخلاقی در پرتو سنت وسلف.

6th week	ارتباط اخلاق با ایمان عبادات ومعاملات
7th week	نشانه های اخلاق نیکو، اسباب وعواقب اخلاق زشت، اسباب دگرگونی اخلاق نیک به زشت
8th week	نکات مهم پیرامون پرورش اخلاق: حصول فضایل اخلاق، روشهای پرورش .....، ابزار بدست آوردن روشهای اخلاقی
Mid Term Exam	
9th week	مکارم اخلاقی(فردی) اخلاص، صدق، امانت
10th week	مکارم اخلاقی (فردی) صبر، حیاء، وفاء به عهد، (متباقی عناوین مکارم اخلاقی فردی و اجتماعی به شاگردان سمینار داده شود)
11th week	مکارم اخلاقی (اجتماعی) تعاون، اصلاح طلبی، عفو
12th week	رذایل اخلاقی (فردی) تکبر، دروغ، خیانت
13th week	رذایل اخلاقی (فردی) بخل، حسد، سوء ظن
14th week	رذایل اخلاقی (اجتماعی) استهزاء،غیبت، تجسس،دشنام، (متباقی عناوین رذایل اخلاقی فردی واجتماعی به شاگردان سمینار داده شود).
15th week	علل آغشته شدن به رذایل اخلاقی
16th week	پیامدها زشت رذایل اخلاقی در انحراف فرد وجامعه ، علاج رذایل اخلاقی دراسلام
Final Term Exam	

Fourth Semester Course Outlines

Fourth Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Database Management System	CS-CS-0417	3	1	4	5	Professional	CS-CS-0316
2	Web Engineering	CS-CS-0418	3	1	4	5	Professional	CS-CS-0311
3	System Administration	CS-CS-0419	3	1	4	5	Professional	CS-CS-0315
4	Data Communication	CS-CS-0420	2	2	0	2	Professional	NIL
5	Computer Organization & Architecture	CS-CS-0421	2	2	0	2	Professional	NIL
6	Advanced Programming	CS-CS-0422	4	2	4	6	Professional	CS-CS-0314
7	Islamic Studies-IV	CS-CS-0407	1	1	0	1	Inclusive	CS-CS-0307
	Total		18	10	16	26		

DBMS (Database Management system)

Subject Name	DBMS (Database Management system)
Subject Code	CS-CS-0417
Subject Status	Professional
Credits	03
Course Objectives	This course introduces the fundamental and practical techniques of the DBMS like SQL server and MS Access etc. it also provides approach to emerging technologies, and to provide insight into related DBMS issues. In this course students will analyze relation database applications describe and use techniques to develop databases system.
Reference Books	f. Modern database management by Jeffrey A.Hoffer Mary B.Prescot Fred R g. Effective Oracle Database Management By Design oracle 10g database administrator 1 & 2 claireRajan h. Principles of Distributed Database Systems, M. Tamer Ozsu, Patrick Valduriez
Weeks	**Topics**
1st week	• The core objectives and learning outcomes of DBMS. • An overview of SQL Server and its various editions. SQL Server database and authentication and authorization.

2nd week	• **DDL Commands:** Creating and Managing Tables and Databases • Using DDL commands (CREATE, ALTER, DROP) to create and manage tables and databases Adding, dropping, and modifying columns in tables • Renaming tables and databases Data Types in SQL Server
3rd week	• Delete all records while preserving the table structure. • Modifying table Columns Add, drop, or alter columns in an existing table. Renaming Objects Change names of tables or databases for reorganization.
4th week	• Using the, WHERE clause in SELECT statements. • Logical operators in the where, order by, clause, DISTINCT in SELECT statements. • insert, update and delete statements. Introduction to Dynamic Data Masking.
5th week	• TOP, LIMIT, and ROWNUM Clauses • LIKE Operator and Wildcards • IN and BETWEEN Operators Aliases Query Optimization and Basic Performance Tuning
6th week	• Dropping a database • Backing Up a Database and Backing Up to URL Restoring a Database
7th week	• SQL Constraints and Types of Constraints • NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK, DEFAULT, and INDEX. • Cascade rules for DELETE and UPDATE. AUTO_INCREMENT fields in SQL Server.
8th week	• SQL Joins and Types of Joins • SET Operators UNION, UNION ALL, and INTERSECT command .
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	• GROUP BY and HAVING Clauses • Subqueries • Explanation with examples. • Benefits of using subqueries. • Views Advantages and disadvantages of views with examples.
11th week	• **Functions** • Advantages and disadvantages of functions with examples. User-defined functions and system-defined functions.

12th week	• **Advanced Functions** • EXISTS operator. • ANY and ALL operators. CASE statement.
13th week	• SQL Injection Stored Procedures
14th week	• Exception Handling TRY...CATCH blocks.
15th week	• **Triggers** • DML triggers. FOR/AFTER and INSTEAD OF triggers.
16th week	• Transactions • User Creation • Logins • Roles • Introduction to SQL Server Files • MDF files. • LDF files.
Final Term Exam	

Web Programming

Subject Name	Web Engineering
Subject Code	CS-CS-0418
Subject Status	Professional
Credits	03
Course Objectives	A website is a collection of related web pages, including multimedia content, typically identified with a common domain name, and published on at least one web server. The course will give you a grounding in the advanced concepts of php script, and code that create web pages. We will be focusing on the object oriented capability of php.
Reference Books	i. PHP & MySQL Novice to Ninja – by Kevin Yank
Weeks	**Topics**
1st week	Introduction to PHP Installation (XAMPP, WAMP, LAMP) Syntax & Basic Structure Variables & Data Types
2nd week	Operators in PHP Conditional Statements (if, else, switch) Loops (for, while, do-while, foreach) Arrays (Indexed, Associative, Multidimensional) Functions & Superglobals ($_GET, $_POST, $_SESSION, $_COOKIE)

3rd week	Forms Handling Form Validation (Required Fields, Email, URL) Handling User Input (POST & GET Methods) Preventing XSS (Cross-Site Scripting)
4th week	File Handling (Open, Read, Write, Delete) Uploading Files in PHP Managing File Permissions Working with Date & Time
5th week	Introduction to Cookies Setting & Retrieving Cookies Sessions in PHP Session Security Best Practices
6th week	PHP Filters & Advanced Filtering Error Handling (try-catch, Custom Errors) PHP Exception Handling
7th week	Preventing SQL Injection Hashing Passwords with bcrypt .Setting server and request variables Establishing global and static variable scope.
8th week	.Making a reference assignment Using references as function arguments.
Mid Term Exam	
9th week	Midterm Exam
10th week	Object-Oriented Programming
11th week	Inheritance and Methods
12th week	Static Methods and Constants
13th week	Constructors and Destructors
14th week	MySQL Setup and Tables
15th week	Prepared Statements and Select
16th week	Final Review & Update/Delete
Final Term Exam	

Data Structure

Subject Name	Advanced Programming
Subject Code	CS-CS-0422
Subject Status	Professional
Credits	04
Course Objectives	To teach attendees the fundamentals of Java programming and how to use Java to write applications, at the end the student are able to know by the basic syntax of Java.

Reference Books	j. Fundamentals of Java Third Edition, by Kenneth Lambert, Martin Osborne k. Black Book series
Weeks	**Topics**
1st week	Introduction Preliminaries, Algorithms, Time Space Tradeoff
2nd week	Execution Flow: Sequential, Conditional, Iterative
3rd week	Array Data Structure: One Dimensional, Two Dimensional, Array Access Methods: Dope Vector, Liffee, Access Table
4th week	Array Insertion, Deletion and Traversing Algorithms and Implementations.
5th week	Linear Data Structures: Stack Data Structure.
6th week	Stack Representation, Operations, Stack Algorithm Implementation.
7th week	Evaluation of Expressions: Infix to Postfix Conversions
8th week	• Queue Data Structure: Representation of Queues. • Algorithms implementation for Queue Data Structure
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	• Linked Lists Data Structure: Pointers, Single Linked List, Representation of linked list in Memory
11th week	Linked List Creation, List Traversing, Linked List Insertion.
12th week	• Introduction to Sorting: Selection Sort, Algorithm Implementation for Selection Sort
13th week	• Insertion Sort, Algorithm implementation for Insertion Sort. • Bubble Sort, Algorithm implementation for Bubble Sort
14th week	Searching: Sequential Search (Linear Search), Binary Search.
15th week	Non-Linear Data Structures: Trees, Binary Search Tree Traversing Operations: Pre-order, In-Order and Post-Order Traversals.
16th week	Introduction to Graphs, Types of Graphs: Undirected, Directed, Weighted, Complete and Regular Graphs
Final Term Exam	

Computer Architecture and Organization

Subject Name	Computer Architecture and Organization
Subject Code	CS-CS-0421
Subject Status	Professional
Credits	02
Course Objectives	1. Discuss the basic concepts and structure of computers. 2. Understand concepts of register transfer logic and arithmetic operations. 3. Explain different types of addressing modes and memory organization. 4. Learn the different types of serial communication techniques. 5. Summarize the Instruction execution stages
Reference Books	l. Computer Organization and Architecture by William Stalling 7th edition m. web www.WilliamStallings.com/studentssupports.html
Weeks	**Topics**
1st week	Computer Organization and Architecture • Structure and Function. • A simplified view of Computer.
2nd week	• Computer Evolution (Generations). • First Generation till 5th generation of computer. Change of technologies.
3rd week	• Registers, Cache Memory and its types. • Multicore Computer Structures. Microprocessor
4th week	• Key Characteristics of System/360 Family. • DEC PDP 8. • Intel's 1971s series processors. • Evolution of Intel Microprocessor. Pentium processors.
5th week	• Micro Processor Speed. Branch Prediction, data flow analysis, speculative execution.
6th week	• Embedded System. • Requirements and constraints of Embedded system. ARM Evolution.
7th week	• Computer Components and Top-level view. • Instruction Cycle & its State Cycle. • Fetch Cycle. • Execute Cycle.

8th week	• Interrupts. • Transfer of Control via Interrupts. • Classes of Interrupts. • Program Flow Control.
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	• Interconnection of Structure. • Bus • System Bus & its Model. Data Bus & Address Bus.
11th week	• Computer Memory & its types. • Multilevel cache organization. Cache Mapping & its techniques.
12th week	• Direct Mapping Techniques. • Fully Associative Mapping. Cache Replacement Algorithms.
13th week	• Chip Logic, Packaging. • Types of DRAM, SRAM ROM.
14th week	• External Memory: Magnetic Disk, Reading and writing data organization.
15th week	• RAID Levels. • Optical Memory • CD (Compact Disk) Digital Versatile Disk
16th week	• Input, Output, External devices. • I/O Channels and Processors interrupt driven I/O
Final Term Exam	

System Administration

Subject Name	System Administration
Subject Code	CS-CS-0419
Subject Status	Professional
Credits	03

Course Objectives	This course introduces basic to advanced concepts and implementation of computer networks in small to large enterprises. The course contains important client & server's concepts, configurations and implementations in the organizations and enterprises through Microsoft Platform. By the end of this course, students will be able to manage, install, configure and implement a complete network through Microsoft Platform:
Reference Books	n. MCTS Training Kit 70-640 Configuring Windows Server 2008 Active Directory o. Microsoft.Press.MCITP.Self.Paced.Training.Kit.Exam.70 646.Windows.Server.Administration p. MCTS Training Kit 70-640 Configuring Windows Server 2008 Active Directory
Weeks	**Topics**
1st week	Introduction to System Administration & Windows Server 2022. Overview of System Administration, Windows Server 2022 editions and features, Network fundamental and addressing scheme. Installing windows server 2022.
2nd week	File System Management & Security.Understanding FAT, FAT 32 & NTFS. File Permission and access control list (ACL). Configuring file & folder permission.
3rd week	Windows Server Installation & Virtualization. Installation method (GUI, Core). Hyper-V virtualization and configuration.
4th week	Command-Line & PowerShell Administration. Essential CMD & PowerShell Commands for Admins.
5th week	• Windows Server Network Configuration. Configuring IP Addresses, Subnets, MAC Addresses Working with PING, NSLOOKUP & TRACERT Command.
6th week	• Windows Server Roles & Features. Overview of Windows Server Roles & Features Managing Features via Server Manager & PowerShell.
7th week	• File Sharing & Storage Management. • Implementing File Sharing, Disk Quotas, and Permissions. Configuring Storage Spaces
8th week	• Domain Name System (DNS) Administration. • Understanding & Configuring DNS in Windows Server 2022 DNS Zones, Records, and Troubleshooting.
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	• Active Directory Domain Services (AD DS). • Introduction to Active Directory & Domain Controllers Organizational Units (OUs), Users, Group Management.

11th week	• Group Policy Management & Security Policies. • Creating & Managing Group Policies (GPOs) Security & Compliance Policies (Windows Defender, Audit Policies).
12th week	• Network Services (DHCP, VPN, and Remote Access). • Configuring Dynamic Host Configuration Protocol (DHCP) Setting Up VPN & Remote Access.
13th week	• File & Print Server Administration. • Configuring File Servers, Permissions & Access Control Print Server Deployment & Management.
14th week	• Web Server (IIS) & FTP Services. • Installing & Configuring Internet Information Services (IIS) Managing Websites, FTP, SSL Certificates.
15th week	• Windows Server Backup & Disaster Recovery. • Backup Strategies (Full, Incremental, Differential, System State) Configuring Windows Server Backup & Restore.
16th week	• Additional Domain Controllers (ADC) & Read-Only Domain Controllers (RODC) Setting Up Additional & Read-Only Domain Controllers
Final Term Exam	

Data Communication

Subject Name	Data Communication
Subject Code	CS-CS-0420
Subject Status	Professional
Credits	02
Course Objectives	1. To learn the basic concepts of data communications. 2. To learn the layered architecture of communication protocols. 3. To learn digital signal transmission and encoding techiniques. 4. To learn multiplexing techniques. 5. To learn the concepts and techniques in error detection and correction. 6. To learn data link control and its related protocols. 7. To learn LAN architectures and systems. 8. To learn switching techniques. 9. To learn the main protocols and standards of the Internet. 10. To learn basic concepts of internetworking, addressing, and routing.
Reference Books	q. Data Communication & Networking, Fourth Edition byBehrouz A. Forouzan r. Data & Computer Communication by William Stalling
Weeks	**Topics**
1st week	Basic Concept of Data Communication, Fundamentals & Components of Data Communication, Modes of Communication: Simplex mode, Half duplex mode, Full duplex mode
2nd week	Analog and Digital Signals, Analog and Digital data.
3rd week	Periodic and Non-Periodic Signals, Analog Signals: Sine wave, peak amplitude, Time period,
4th week	Frequency, Phase, Wavelength, Bandwidth
5th week	Digital Signal: BCS rate, BCS length, Transmission of digital signal
6th week	Transmission Issues Attenuation, Distortion, Noise
7th week	Channel Capacity: Noiseless Channel (Nyquist BCS rate), Noisy Channel (Shannon Capacity)
8th week	PERFORMANCE Bandwidth Throughput Latency (Delay)
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	Bandwidth-Delay Product Jitter
11th week	Latency: Propagation time, Transmission time, Queuing time, Process time
12th week	DIGITAL-TO-DIGITAL CONVERSION Line Coding Line Coding Schemes

13th week	Line Coding: Unipolar (NRZ), Polar (NRZ, RZ, Bi phase, Manchester & Differential Manchester), Bipolar (AMI & Pseudo Ternary), Multilevel (2B/1Q, 8B/6T, 4D-PAMS), Multi-Transition (MLT-3)
14th week	ANALOG-TO-DIGITAL CONVERSION Pulse Code Modulation (PCM) Delta Modulation (DM)
15th week	TRANSMISSION MODES Parallel Transmission Serial Transmission
16th week	Block Coding
Final Term Exam	

مفردات مضمون:ثقافت اسلامی 4 (نظام اجتماعی اسلام)

Subject Name	مفردات مضمون:ثقافت اسلامی 4 (نظام اجتماعی اسلام)
Subject Code	CS-CS-0407
Subject Status	Inclusive
Credits	01
Course Objectives	نظام اجتماعی عبارت از اصول و ارزشهای است که روابط انسانها ویا زندگی اجتماعی انسانها را تنظیم می کند ودر روشنایی آن قوانین کشور ها تدوین میگردد.
Reference Books	کتاب مقرر : نظام اجتماعی اسلام (کتاب) تالیف :نقیب الله حمید
Weeks	**Topics**
1st week	مفهوم شناسی ، اصول ومبانی نظام اجتماعی اسلام
2nd week	ویژکی های نظام اجتماعی اسلام، اهداف نظام اجتماعی اسلام
3rd week	ساختار جامعه، ساختار فرد، تشکیل خانواده
4th week	مقدمات ازدواج، نکاح واحکام آن
5th week	معیار های گزینش همسر، مهر و احکام آن، عرف و عنعنات جامعه.
6th week	محرمات نکاح- تعدد زوجات.
7th week	حقوق اعضای خانواده: شوهر، خانم، والدین.
8th week	حقوق فرزندان، انحلال خانواده: طلاق.
Mid Term Exam	
9th week	تقسیم طلاق بر اساس امکان و عدم امکان رجوع. طلاق باین، لعان، ایلاء.
10th week	ظهار، فسخ، خلع، تفریق.
11th week	روابط اجتماعی: حقوق خویشاوندان، همسایه، مسلمان، دوست.
12th week	آداب اجتماعی: آداب راه، آداب خورد و نوش، آداب سفر.
13th week	آداب لباس، پوشش زن مسلمان، آداب مجلس.

14th week	مبارزه با انحرافات در جامعه: انحرافات فکری سکولریزم، استشراق، تنصیر.
15th week	انحرافات اخلاقی: اختلاط
16th week	مخدرات، قمار، رقص و موسیقی.
Final Term Exam	

Fifth Semester Course Outlines

Fifth Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Digital Logic & Computer Design	CS-CS-0523	2	2	0	2	Core	NIL
2	Software Engineering-I	CS-CS-0524	3	3	0	3	Professional	NIL
3	Operating System Concepts	CS-CS-0525	3	3	0	3	Professional	NIL
4	Data Structure	CS-CS-0526	3	2	2	5	Core	NIL
5	Advanced Web Engineering	CS-CS-0527	2	1	2	3	Professional	CS-CS-0418
6	Network Engineering	CS-CS-0528	4	1	6	7	Professional	CS-CS-0419
7	Islamic Studies-V	CS-CS-0507	1	1	0	1	Inclusive	CS-CS-0407
	Total		**18**	**13**	**10**	**24**		

Software Engineering-I

Subject Name	Software Engineering-I
Subject Code	CS-CS-0524
Subject Status	Professional
Credits	03
Course Objectives	At the end of the course, student will be able to understand the basic to advance concepts of Software engineering, life cycle of system design, and the complexity involved in it. The students will also be able to optimize the system, making it error free, and concentrate on quality using traditional engineering approaches
Reference Books	s. Software Engineering by P.Jalot (Indian Author) t. Software Engineering by PressMan 5th Edition u. Roger Pressman, Software Engineering, 6th Edition, McGraw Hill, 1997.
Weeks	**Topics**

1st week	• What is Software and Software Engineering? • Different types of software Characteristics of good software
2nd week	Software development life cycle (Feasibility, Requirement Gathering, Designing, Coding, Testing, Deployment, and Maintenance)
3rd week	• Role of Software Engineering • Professional and ethical responsibilities of Software Engineers Possible risks and difficulties in Software Engineering
4th week	• Project management Activities performed by a software project manager
5th week	• What is a software process model? • Types of software process models Waterfall Model: Outputs and limitations
6th week	• Prototype Model: Goals, advantages, and limitations Incremental, Agile, DevOps, and Spiral Models
7th week	• Software development team roles Project scheduling
8th week	• Types of Requirements. • Software Requirement Specification (SRS) and its rules • Problem analysis Structured information (Partitioning, Abstraction, Projection) • Characteristics of SRS documents Components of SRS
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	• System Design • Detailed System Design • Design Characteristics • Design Strategies and Techniques Coupling and Cohesion
11th week	• Design Methods • Data Design, Architectural Design, The Architectural Design Process Transform Mapping, Transaction Mapping, Design Post Processing
12th week	• Architectural Design Optimization • Interface Design and Human-Computer Interface (HCI) Design Interface Design Guidelines and Procedural Design
13th week	• Code Review and Best Practices • Clean Code Principles and Coding Standards • Code Refactoring: Techniques to improve code quality • Version Control Systems • Code Verification Methods and Techniques Pair Programming

14th week	• Software Testing Method. • Fundamentals of software testing • Strategies approaches to software testing and strategic issues Test case design
15th week	• White-box testing • Black Box Testing • Unite Testing. • integration testing. • System testing. Acceptance testing.
16th week	Artificial Intelligence (AI) and Machine Learning (ML) integration into software development.
Final Term Exam	

Data Structures

Subject Name	Data Structures
Subject Code	CS-CS-0526
Subject Status	Core
Credits	03
Course Objectives	By completing this course the students will be able to understand the basics of Data Structures. They will also know the elementary Data Structures. They will also be able to implements all data structure techniques using programming language C++ etc.
Reference Books	v. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms, 2nd Edition, The MIT Press, 2001. w. Robert Sedgewick, Philippe Flajolet, An Introduction to the Analysis of Algorithms, 1st Edition, Addison Wesley Publishing Company, 1995. x. Aron M. Tanenbaum, Data Structures, Prentice Hall y. C M Aslam, T A Qureshi, Data Structures in C++ z. Seymour Lipschutz Theory and Problems of Data Structures, Schaum Series
Weeks	**Topics**
1st week	Introduction Preliminaries, Algorithms, Time Space Tradeoff
2nd week	Data Structures Operations Search Techniques Linear, Binary
3rd week	String Processing: Construction, Storage, Operations
4th week	Linear Data Structures I: Arrays, Records, Pointers
5th week	Construction, Storage, Operations Linear Data Structures II: Link List Simple, One-way, Two-Way, Circular
6th week	Construction, Storage, Operations Linear Data Structures III: Stack, Queue
7th week	Construction, Storage, Operations
8th week	Non Linear Data Structures I: Trees
Mid Term Exam	
9th week	General, Binary: Construction, Storage, Operations Non Linear Data Structures II: Graphs Construction, Storage, Operations
10th week	Sorting Techniques I: Selection, Insertion, Quick sort Techniques, Implementations Sorting Techniques II: Bubble, Heap, Merge, Radix sort Techniques, Implementations

11th week	Introduction of algorithms Properties of algorithms Features of algorithms
12th week	Factors influencing the performance of algorithms (not in control of the programmer), Analysis of Algorithms Classification of algorithms
13th week	Empirical analysis Introduction to Generation functions
14th week	System approach Algorithms and systems
15th week	Dynamic programming Greedy algorithms,
16th week	Divide and conquer approach
Final Term Exam	

Operating System Concepts

Subject Name	Operating System Concepts
Subject Code	CS-CS-0525
Subject Status	Professional
Credits	03
Course Objectives	This course intends to cover the preliminaries of Operating System. Students are exposed to the basic concepts of some market-oriented operating systems. After the completion of this course the students will feel familiar with the logic behind working of a typical operating system. They will have understanding of the topic like resource management, Interrupts, memory management, system scheduling and memory management
Reference Books	aa. Operating System Concept, Seventh Edition by Silberchatz, Galvin, Gagne bb. Modern Operating System, Second Edition by TenenBaum cc. An Introduction to Operating System, Second Edition byDeitel, H.M
Weeks	**Topics**
1st week	Introduction to Operating System Introduction to OS, Definitions, purposes of OS Computer System Components
2nd week	Types of System: Batch system, Desktop System, Distributed Systems, Real Time systems Operating System Structure

3rd week	OS Structure: Simple Structure, Layered Approach, Micro Kernels System call & Programs
4th week	Process Management Process Concept, Process states, Process Control Block (PCB) Process Scheduling, Process Scheduling Queues, Operations on Process
5th week	Inter-Process Communication (IPC): Shard-Memory System, Message-Passing System
6th week	Threads Thread Concept, Characteristic & Benefits
7th week	User & Kernel Threads
8th week	Midterm Exam + Network Security Basics CPU Scheduling Scheduling Basic Concept
Mid Term Exam	
9th week	CPU Scheduler, Scheduling Criteria, Dispatcher Scheduling Algorithms: First Come First Server Scheduling (FCFS),
10th week	Shortest Job First (SJF) Scheduling, Priority Scheduling, Round Robin Scheduling(RR), Multilevel Scheduling
11th week	Main Memory Management Basic Concept, Address types, Address binding, Memory Management Unit (MMU), Dynamic loading
12th week	Swapping: background, types of swapping, Contiguous allocation Paging: Basic Paging method, Address translation scheme, Memory protection, shared pages
13th week	Segmentation: Segmentation Architecture, Segment allocation
14th week	File Systems File Concept, file Attributes, file operations, file types, file structure File Access Methods: Sequential & Direct Methods File system mounting, File Sharing, file Protection
15th week	Mass Storage Structure Magnetic disk & Tapes Disk structure Disk scheduling, Disk scheduling algorithms: FCFS, SSTF, C-SCAN, LOOK, C-LOOK
16th week	OS Security Threats & Defense Mechanisms Authentication, Access Control Lists (ACLs), Firewalls **Lab:** Implementing User Authentication and Access Control
Final Term Exam	

Digital Logic & Computer Design

Subject Name	Digital Logic & Computer Design
Subject Code	CS-CS-0523
Subject Status	Core
Credits	02
Course Objectives	The course covers the basic principles of Digital Logic and computer design, its Numbering System's (binary, octal, decimal and hexadecimal) operations and performance. It also deals with Boolean algebra and Logic Gates. After this course a students will understand Digital Integrated Circuits and Registers etc. and their functions etc
Reference Books	dd. Digital Logic & Computer Design, by M. Morris Mano ee. Fundamental Concept of Computer System by Asiya Sultan, AmenaNudrat
Weeks	**Topics**
1st week	Numbering Systems Decimal, Binary, Octal and Hexadecimal Numbering systems
2nd week	Conversions of Numbering System
3rd week	Binary Arithmetic: Binary Addition, Subtraction, Multiplication, Division
4th week	Complements: 9's & 10's Complements, 1's & 2's Complements
5th week	Data type & their Representation using Binary coding schemes
6th week	Boolean Algebra and Logic Gates
7th week	Boolean Algebra: logical addition, logical multiplication, logical negation
8th week	Logical Gates: OR, AND, NOT, NAND, NOR, XOR, XNOR
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	Laws of Boolean algebra: Rules, Duality Principle
11th week	Theorems of Boolean algebra, De-Morgan's theorems
12th week	Standard/Canonical Forms of Boolean: Min-term & Max-term, SOP & POS, conversion of expressions
13th week	Simplification of Boolean Expressions
14th week	Simplification of Boolean Expression: using Laws & Theorems
15th week	Map Method (Karnaugh map method)
16th week	• Minimization of Boolean Expressions Karnaugh Map Minimization of 3 Variable through Karnaugh Map.
Final Term Exam	

Advanced Web Engineering

Subject Name	Advanced Web Engineering
Subject Code	CS-CS-0527
Subject Status	Professional
Credits	02
Course Objectives	PHP is a widely-used, open source scripting language Overall Introduction to PHP. Objective behind this course is to give basic Knowledge of PHP Learn about PHP Syntax. 4)PHP Arrays PHP Loops PHP and MySQL connectivity. PHP form validation PHP form handling You can get a job in software industry as web developer.
Reference Books	ff. The Joy of PHP Programming: A Beginner's Guide – by Alan Forbes gg. PHP & MySQL Novice to Ninja – by Kevin Yank
Weeks	**Topics**
1st week	**Chapter one: Introduction OOP** • Introduction to OOP • PHP OOP • PHP OOP - Classes and Objects • PHP - The $this Keyword • PHP OOP – Constructor PHP OOP - Destructor
2nd week	**Chapter two: PHP OOP Pillars** • PHP - Access Modifiers • PHP OOP – Inheritance • Overriding The final Keyword
3rd week	• PHP - Class Constants • PHP OOP - Abstract Classes PHP OOP - Traits
4th week	• PHP OOP – Interfaces • PHP OOP - Static Methods • PHP - Static Properties PHP – Autoloader
5th week	**Chapter three: PHP PDO Introduction** • PHP Connect to MySQL • PDO (PHP Data Objects) • PDO Installation PDO Connection

6th week	• PDO Create DB • PDO Create Table **Chapter four: PHP PDO CRUD** • PDO Select Data PDO Delete Record
7th week	• PDO Insert Record • PDO Update Record PDO Prepared Statements
8th week	• PDO Named Parameters • PDO Positional Parameters PDO CRUD Operations
Mid Term Exam	
9th week	**Chapter five: PHP Laravel Introduction** • Laravel framework of PHP • Introduction • Installation • Composer • MVC introduction Directory structure of Laravel
10th week	• Frontend • Views • Blade Templates • Routing Passing data to view
11th week	**Chapter six: PHP Laravel Components** • Laravel Controllers • Creating a controller Creating a resource controller
12th week	• Migrations • Models Seeding
13th week	• Laravel – MySQL connection CRUD Operations
14th week	• Eloquent ORM Factories

15th week	• Authorization Authentication
16th week	**Chapter seven: Project** Mini Project
Final Term Exam	

Network Engineering

Subject Name	Network Engineering
Subject Code	CS-CS-0528
Subject Status	Professional
Credits	04
Course Objectives	This course introduces basic to advanced concepts of implementation of routing and switching covered in depth in small to large enterprises. The course contains important concepts, configuration and implementation in the organizations and enterprises. At the end of the course, students will be able to work, configure, install and implement a complete network infrastructure through CISCO Platform.
Reference Books	hh. Wireless Communication, 2nd Edition T.S. Rappaport ii. Communication and Networking, 4th Edition A. Forouzan jj. CCNA SYBEX Books kk. CCNA Cisco Press, □CCNA Todd Lamely 6th Edition
Weeks	**Topics**
1st week	Chapter 01: IP Addressing Scheme • Routers • IPV4 Addressing & IPV Addressing • Finding Network ID using AND operations • Sub netting using IPV4 • Class A. B and C Sub netting • Designing Variable Length Subnet Mask • Working through real world scenarios
2nd week	Chapter 02: Understanding Cisco IOS • Cisco IOS • Overview of Cisco IOS • Router 2600 and 2800 Startup • Router Components • Cisco Router Startup detail • Saving the configuration files
3rd week	• Editing the configuration files • upgrading and restoring Cisco ios images • Router basic configuration • Assigning IP address to router interface • Securing Router through passwords • Identifying and correcting common network problems • Router remote configurations • Remote configuration through SSH • Cisco Password Recovery • Managing IOS and configuration files using TFTP Server

4th week	Chapter 3: IP Routing • IP Routing • Routing basics • Static Routing • Default Routing • Dynamic Routing
5th week	• Static route configuration • Default Route configuration
6th week	Chapter 4: Dynamic Routing Protocol • RIP
7th week	• EIGRP
8th week	• OSPF
Mid Term Exam	
9th week	Chapter 5: Access Control List • IP Access List • Benefits of Access List • IP traffic Management through Access Lists
10th week	• Standard Access Lists • Extended Access Lists • Named Access Lists
11th week	Chapter 6: Network Address Translation • Public and Private Addresses • Network Address Translation • Why NAT
12th week	• Configure and verify Static NAT • Configure and verify Dynamic NAT • Configure and verify Port Address translations Chapter 7: Layer 2 Switching • Catalyst 2950 Switches • Layer 2 switching technology • Catalyst 2950 configurations basics
13th week	• Loop avoidance using STP • Configure and Verify STP Operations • Introduction to Switch Technology • Configuring security on cisco switches
14th week	Chapter 08: Implementing DHCP on Cisco • Introduction • Importance of DHCP • Configure DHCP on cisco routers • Verify and troubleshoot

15th week	Chapter 09: VLAN'S • Introduction to Virtual LANS • Theoretical background • Configuring VLAN on catalyst 2950 • Configuration of TRUNK ports • Inter VLAN routing • Sub interfaces concepts • Configuring sub interfaces
16th week	Chapter 10: Point to Point Protocol • Point to Point Protocol introduction • PAP and CHAP Authentication • Configuring PPP with PAP and CHAP on cisco routers
Final Term Exam	

(نظام اقتصاد اسلام) 5 مفردات مضمون:ثقافت اسلامی

Subject Name	مفردات مضمون:ثقافت اسلامی 6 (نظام اقتصاد اسلام)
Subject Code	CS-CS-0507
Subject Status	Inclusive
Credits	01
Course Objectives	نظام اقتصاد اسلامی عبارت از اصول و ارزشهای است که روابط انسانها ویا زندگی اقتصادی انسانها را تنظیم می کند ودر روشنایی آن قوانین کشور ها تدوین میگردد.
Reference Books	کتاب مقرر : نظام اقتصادی اسلام تالیف :محمد یونس ابراهیمی
Weeks	**Topics**
1st week	شناخت اقتصاد اسلامی
2nd week	شناخت برخی مصطلحات اقتصادی ونظام سرمایه داری (تعریف، اصول ومشکلات)
3rd week	نظام سوسیالیزم با سلبیات ان ومکتب اقتصادی اسلام (بخش اول: مبادی واصول)
4th week	بخش دوم مکتب اقتصادی اسلام: (بخش تغیرپذیران) با ویزگی های اقتصاد اسلامی
5th week	مصادر اقتصاد اسلامی، مصادر اتفاقی:(قران وسنت) با تعاریف ، حجیت،ومثالها
6th week	مصادر اتفاقی: (اجماع وقیاس) ومصادر اختلافی بدون تفصیل
7th week	تاریخچه اقتصا اسلامی در عصر پیامبران ورسول صلی الله علیله وسلم (مرحله مکی ومدنی)
8th week	تاریخچه اقتصاد اسلامی درعصر خلفاء راشدین وبعد از ان
Mid Term Exam	
9th week	مفاهیم اقتصادی (تولید وعوامل، انگیزه) ووسایل تولید(کار)
10th week	وسایل تولید:(سرمایه وزمین)،وتوزیع ثروت درنظام های مختلف
11th week	بازار وضوابط تعامل در ان
12th week	ملکیت دراسلام وشرایط مشروعیت کسب
13th week	شرکت ها درنظام اقتصادی اسلامی : (تولید، انواع، وسیستم نرخ)
14th week	شناخت پول(تعریف ،فرق ان با نقد وسیستم نرخ)
15th week	شناخت بانکهای اسلامی
16th week	مفاهیم اقتصادی (تولید وعوامل، انگیزه) ووسایل تولید(کار)
Final Term Exam	

Sixth Semester Course Outlines

Sixth Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Analysis of Algorithm	CS-CS-0629	3	2	2	4	Professional	CS-CS-0526
2	Software-Engineering-II	CS-CS-0624	2	1	2	3	Professional	CS-CS-0524
3	Probability and Statistics	CS-CS-0630	2	2	0	2	Core	CS-CS-0313
4	Visual Programming	CS-CS-0631	4	2	4	6	Professional	NIL
5	Advanced Computer Network	CS-CS-0632	3	1	4	5	Professional	CS-CS-0528
6	Artificial Intelligence	CS-CS-0633	2	1	2	3	Professional	NIL
7	Islamic Studies-VI	CS-CS-0607	1	1	0	1	Inclusive	CS-CS-0507
	Total		17	10	14	24		

Analysis of Algorithm

Subject Name	Analysis of Algorithm
Subject Code	CS-CS-0629
Subject Status	Professional
Credits	03
Course Objectives	Computer scientists learn by experience. We learn by seeing others solve problems and by solving problems by ourselves. Being exposed to different problem-solving techniques and seeing how different algorithms are designed helps us to take on the next challenging problem that we are given. By considering a number of different algorithms, we can begin to develop pattern recognition so that the next time a similar problem arises, we are better able to solve it.
Reference Books	ll. Introduction to Algorithms By Thomas H.Cormen, Leiserson, Rivest, and Stein (CLRS) 2001 2nd Edition
Weeks	**Topics**
1st week	• Introduction Definitions: Algorithm, AOA, space complexity and time complexity
2nd week	• Asymptotic notation: best case, worst case and average case BIG O, BIG Omega and BIG Theta

3rd week	Model of computation, Brute force algorithm, Running Time analysis
4th week	• Running Time analysis: Finding out Constant time and linear Time of codes.
5th week	Selection sort, Divide and Conquer Algorithm and Rule,
6th week	Time complexity of Selection Sort
7th week	• Merge sort using the divide and conquer algorithm,
8th week	Time complexity of merge sort
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	Linear Search, time complexity of linear search
11th week	Binary search, time complexity of Binary Search
12th week	Quick Sort using the Divide and conquer algorithm,
13th week	Time complexity of quick sort
14th week	Insertion Sort, Time Complexity of Insertion Sort
15th week	Bubble Sort, Time complexity of Bubble Sort
16th week	• Stack, Big O time complexity of Stack Queue, Big O time complexity of Queue
Final Term Exam	

Probability and Statistics

Subject Name	Probability and statistics
Subject Code	CS-CS-0630
Subject Status	Core
Credits	02
Course Objectives	The basic concept of this course is to know what is statistics?And why it plays very important role in our life and where we use it here we also discussed the role of Probability in our life and we can find the averages and description and dispersion the relationship b/w statistics and probability.
Reference Books	mm. Ronald E. Walpole, Introduction to Statistics, Latest edition, Macmillan Publishing Co. Inc. New York, 1999. nn. I. Miller and J.E Freund, Probability and Statistics for Engineers, 4th Edition, Prentice Hall, 1990.
Weeks	**Topics**

1st week	Introduction Meaning of statistics Importance of statistics in various fields
2nd week	Population and Sample Variables Statistical data
3rd week	Statistical Measures of Data Measures of Central Tendency, Mean, Median, Mode and quartiles Measures of Variation: Range, Standard Deviation, Variance and Coefficient of Variation.
4th week	Sets and Probability The concept of a Set Set Operations and Algebra of Sets Permutations and Combinations
5th week	The Concept of Probability Theorems of Probability Conditional Probability
6th week	Random Variables and Probability Distribution Concepts of a Random Variable Discrete Probability Distributions
7th week	Continuous Probability Distributions
8th week	Joint Distribution of two random variables Mathematical Expectations
Mid Term Exam	
9th week	Special Probability Distributions Binomial Distribution Poisson Distribution
10th week	Hypergometric Distribution Uniform Distribution Normal distribution
11th week	Sampling Theory Sampling Distribution Sampling Distribution of the Mean Sampling Distribution of the differences of means Sampling Distribution of Proportions Sampling Distribution of the Difference of Proportions
12th week	Statistical Inference Point estimation Properties of a good estimator Confidence Intervals Statistical Hypothesis
13th week	Testing a Statistical Hypotheses Tests Concerning Means Tests Concerning Means Tests Concerning Difference between two Means Goodness of Fit Test and Test for Independence

14th week	Simple Linear Regression and Correlation Simple Linear Regression Least Squares estimation of the Regression Parameters
15th week	Inference concerning the Regression Coefficients Linear Correlation
16th week	The coefficient of correlation Properties of the coefficient of correlation
Final Term Exam	

Visual Programming

Subject Name	Visual Programming
Subject Code	CS-CS-0631
Subject Status	Professional
Credits	04
Course Objectives	Students list the visual programming concepts. Explain basic concepts and definitions. Express constants and arithmetic operations. Distinguish variable and data types. Students code visual programs by using Visual Basic work environment. Distinguish and compose events and methods. Recognize and arrange control structures. Design a complete program using visual programming concepts. Students prepare various projects by helping visual programming. Prepare project in visual programming.
Reference Books	oo. Beginning of visual C# by Wrox pp. Programming C# school by FarazRasheed

Weeks	**Topics**
1st week	• C#.NET: Getting Started. • Your First C# Windows Form • Adding Controls to a Form • Properties of a Control • Adding Code to a Button • C# Message Boxes More about Message Boxes
2nd week	• C#.NET: Variables • String Variables in C#. NET • Assigning Text to a String Variable Concatenation in C#
3rd week	• C# Comments • Numbers Variables • Double and Float Variables Double Variables
4th week	• Addition in C# .NET • Adding up with float Variables • Subtraction • Mixing Subtraction and Addition Operator Precedence
5th week	• Multiplication and Division • Getting Numbers from Text Boxes • A C#. NET Calculator-Design • A C#. NET Calculator-Code • The Plus Button The Equals Button

6th week	• Picture boxes, radio buttons, checkboxes, Visible, maximized and other properties.
7th week	• Add Menus to your Forms • Add Menus to Windows Forms in C# • Sub Menus and Men Shortcuts • Code for your Quit Menu • The Edit Menu MDI Containers and their use
8th week	• C#.NET: Conditional Logic • 1. IF Statements • 2. Else ... if Switch Statements
Mid Term Exam	
9th week	**امتحان وسط سمستر**
10th week	• Copy and paste in C#.NET • The View Menu • Adding Images in C#.NET • Open File Dialogue Box in C# • Open a Text File • The Save as Dialogue Box Checkboxes and Radio Buttons
11th week	• Debugging in C#.NET: Master design-time, runtime, and logic errors; utilize breakpoints, the Locals window, and Try/Catch statements for effective debugging. • C# Methods: Learn method fundamentals, parameter passing techniques, and return value handling to structure efficient code. • Event Management: Implement key events (Click, Mouse Down, Key Down) and customize controls (ListBox, ComboBox, WebBrowser) for interactive applications.
12th week	• Database Connectivity: Master SQL Server/Access integration in C#.NET using SQL Viewer Express, datasets, and data adapters for seamless data operations. • Data Management: Implement CRUD functionality (create, read, update, delete records) with navigation controls and search capabilities Relational Concepts: Apply primary/foreign key relationships while designing robust database applications with proper record handling.

13th week	• Multi-Form Management: Create and control multiple forms, implement modal dialogs, and share data between forms in C# applications. • Date Time Handling: Master date/time operations and formatting in C#.NET for effective temporal data processing.
14th week	• File Operations in C#.NET: Learn to open, read, and write text files line by line for efficient data handling. • File Management: Master copying, moving, and deleting files programmatically for streamlined file system control. Practical File Handling: Implement essential I/O operations to manage and manipulate files in real-world applications.
15th week	• OOP Fundamentals: Master classes, objects, properties, and constructors in C#.NET to build structured and reusable code. • Advanced Class Features: Implement inheritance, method overloading, and static methods for efficient object-oriented programming. • Practical Implementation: Learn to pass values, instantiate objects, and leverage class properties for robust application development.
16th week	• Form Management: Implement field validation, data conversions, and clearing functions (Clear) for seamless user input handling. • Access Control: Configure login/logout functionality, user access rules, and account creation for secure form interactions. Tag Utilization: Leverage the txt Tag property for advanced form control and dynamic field management.
Final Term Exam	

Advanced Computer Network

Subject Name	Advanced computer Networks
Subject Code	CS-CS-0632
Subject Status	Professional
Credits	03
Course Objectives	Networking is very common these days, like computer networking, mobile networks etc. This course aims to provide advanced background on relevant computer networking topics to have a comprehensive and deep knowledge in computer networks
Reference Books	qq. Computer Networks: A Systems Approach 3rd edition rr. Author: Larry Peterson and Bruce Davie
Weeks	**Topics**

1st week	IP Addressing & Subnetting Class A, B, C Subnetting Variable Length Subnet Mask (VLSM) Design
2nd week	Enhanced Interior Gateway Routing Protocol (EIGRP) EIGRP Overview and Neighbor Relationships Topology, Routes, and Convergence
3rd week	EIGRP Advanced Features Route Summarization and Filtering Metric Calculation and Unequal Cost Load Balancing Default Routing and Auto-Summarization
4th week	Open Shortest Path First (OSPF) Basics Link-State Concepts & Configuration OSPF Neighbors and Adjacencies on LANs OSPF Network Types
5th week	OSPF LSA Types & Optimization LSA Type 1 (Router LSA), Type 2 (Network LSA), Type 3 (Summary LSA) Controlling LSA Flooding & Optimization
6th week	OSPF Advanced Features OSPF Virtual Links Configuring Virtual Link Authentication
7th week	OSPF Troubleshooting & Optimization Verifying OSPF Operations Configuring OSPF Route Filtering
8th week	Midterm Exam + Network Security Basics Midterm Exam (First 60 Minutes) Introduction to Network Security (Firewalls, ACLs, IDS/IPS)
Mid Term Exam	
9th week	Route Redistribution Basics of Route Redistribution Redistribution Between EIGRP, OSPF
10th week	Route Redistribution in Practice Redistribution into EIGRP & OSPF Policy-Based Routing and IP SLA
11th week	Introduction to BGP, Public vs. Private ASNs Internal BGP (iBGP) vs. External BGP (eBGP)
12th week	• BGP Path Selection & Routing Policies • AS_PATH Attribute and Route Selection • Implementing BGP for Internet Connectivity
13th week	• BGP Route Optimization & Filtering • Outbound Routing Toward the Internet Single-Homed vs. Multi-Homed Networks
14th week	• BGP Advanced Features • BGP Update Messages Examining the BGP Table
15th week	• Introduction to IPv6 Addressing & Routing VLANs and Inter-VLAN Routing

16th week	• Advanced Network Security Measures • Implementing Redundancy Protocols (HSRP, VRRP, GLBP) • Network Performance Optimization
Final Term Exam	

Software Engineering-II

Subject Name	Software Engineering-II
Subject Code	CS-CS-0624
Subject Status	Professional
Credits	02
Course Objectives	In this course, the student will be able to understand OOP's analysis and Design and advance concepts of S/W engineering, life cycle of system OO design, and the complexity involved in it. The students will also be able to making small software with the help of modern concepts of S/W engineering.
Reference Books	a. James Rumbaugh, Object Oriented Modeling and Design, 6th Edition, Prentice Hall International, 2000.
Weeks	**Topics**
1st week	Object Oriented Analysis and Design Introduction a) Introduction & Definitions b) OO Modeling Concepts c) OO Developments
2nd week	Modeling as a Design Technique a) Object Modeling Technique
3rd week	Object Modeling a) Objects & Class b) Links & Associations c) Generalization & Inheritance d) Grouping Constructs e) Aggregation
4th week	f) Abstract Class g) Multiple Inheritance, Meta Data, Candidate Key
5th week	Dynamic Modeling a) Events & States. b) Operations, Nested State Diagram c) Concurrency, Advanced Dynamic Modeling Concepts
6th week	Functional Modeling a) Functional Models, DFD b) Specifying Operations, Constraints c) Relation of Functional to Object and Dynamic Model

7th week	Design Methodology a) Methodology review
8th week	b) OMT as Software Engineering Methodology c) OMT Methodology, Impact of OO approach
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	System Design a) Overview of System Design b) Breaking of System into Sub Systems c) Identifying Concurrency d) Allocating Subsystems to Processors and Tasks e) Management of Data Store f) Handling Global Recurs
11th week	g) Choosing Software Control Implementation h) Handling Boundary Conditions i) Settling Traded-off Priorities j) Common Architectural Framework k) Architecture of ATM System
12th week	Implementation a) From Design to Implementation b) Implementation using programming languages
13th week	c) Implementation using Database System d) Implementation using Outside a Computer
14th week	OO Testing a) Testing OOA and Models b) OO Testing Strategies c) Test Case Design for OO Software
15th week	d) Testing methods applicable at class levels e) Inter class test case design
16th week	Object Diagram Compiler a) Background b) Problem Statement c) Analysis
Final Term Exam	

Artificial Intelligence

Subject Name	Artificial Intelligence
Subject Code	CS-CS-0633
Subject Status	Professional
Credits	02
Course Objectives	Artificial Intelligence is the study of the science of making intelligent machines, especially intelligent computer programs. In this field we try to understand human intelligence and after it we use computers to adapt (implement using computer programs) this intelligence. This subject contains concepts from many other subjects of computer science and it uses these concepts to give practical solutions for the benefit of human beings.
Reference Books	ss. Book Title: Artificial Intelligence Citation: Winston (1992) Author: Patrick Henry Winston Edition: Third tt. Book Title: Artificial Intelligence: Structures and Strategies for Complex Problem Solving Citation: Luger (2005) Author: George F Luger Edition: Fifth Publisher: Addison-Wesley
Weeks	**Topics**
1st week	Introduction to Artificial Intelligence
2nd week	Types of Artificial Intelligence
3rd week	Introduction to pandas Module
4th week	Introduction to matplotlib Module
5th week	Introduction to Machine Learning
6th week	Supervised Learning Algorithms
7th week	Unsupervised Learning Algorithms
8th week	Model Evaluation and Validation
Mid Term Exam	
9th week	Neural Networks and Backpropagation
10th week	Convolutional Neural Networks (CNNs)
11th week	Recurrent Neural Networks (RNNs)
12th week	Advanced Deep Learning Techniques
13th week	Introduction to Natural Language Processing (NLP)
14th week	Practical Projects
15th week	Practical Projects

16th week	Final Term Exam
Final Term Exam	

(نظام سیاسی اسلام) 6 مفردات مضمون: ثقافت اسلامی

Subject Name	مفردات مضمون: ثقافت اسلامی 5 (نظام سیاسی اسلام)
Subject Code	CS-CS-0607
Subject Status	Inclusive
Credits	01
Course Objectives	نظام سیاسی عبارت از اصول و ارزشهای است که روابط انسانها ویا زندگی سیاسی انسانها را تنظیم می کند ودر روشنایی آن قوانین کشور ها تدوین میگردد.
Reference Books	کتاب مقرر : نظام سیاسی اسلام تالیف :دکتور فصیح الله
Weeks	**Topics**
1st week	مفهوم نظام سیاسی اسلام، مبانی نظام سیاسی اسلام
2nd week	ویژگیهای نظام سیاسی اسلام ، اهداف نظام سیاسی
3rd week	اسلام وسیاست: دلایل اثبات وجود نظام سیاسی در اسلام
4th week	عوامل جدایی دین از سیاست، پیامد های جدایی دین از سیاست
5th week	تعریف دولت ،عناصرمتشکله دولت،ارکان دولت(قوهء اجراءیه اعضای قوه اجرائیه)
6th week	رئیس دولت : حکم تعیین، نامها والقارب،شروط ومواصفات، طرق انتخاب، حقوق و واجبات
7th week	عزل رئیس دولت، وزراء و ولات
8th week	قوه مقننه ، تعریف شورا، حکم ، اهمیت ، شروط وکیفیت انتخاب اعضای شورا، اختصاصات وصلاحیت های اعضاء، عزل اعضای شورا
Mid Term Exam	
9th week	قوه قضایه،تعریف، دلیل مشروعیت، حکم، اهمیت، شروط تعیین وجهت تعیین کننده
10th week	وظایف دولت درنظام سیاسی اسلام :تحکیم شریعت ، تأمین امنیت، اقامه عدالت، دفاع از حریم دولت.
11th week	امر به معروف و نهی از منکر، جمع آوری زکات وتوزیع آن به مستحقین، نشر دعوت
12th week	تامیین حقوق رعیت،تامیین خدمات، فراهم نمودن زمینه تربیت وتعلیم
13th week	روابط دولت: وابط دولت اسلامی با دولت های اسلامی و دولت های غیر اسلامی
14th week	صلح درنظام سیاسی اسلامی تعریف صلح، شروط صلح
15th week	اهمیت صلح در اسلام، انواع صلح، نهاد های صلح در اسلام

16th week	تكرار ما سبق
Final Term Exam	

Seventh Semester Course Outlines

Seventh Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Elective Subject-I	CS-CS-0734	2	1	2	3	Elective	NIL
2	Mobile Application Development	CS-CS-0735	4	2	4	6	Professional	CS-CS-0422
3	Automata Theory & Compiler Construction	CS-CS-0736	3	3	0	3	Professional	CS-CS-0629
4	Business Communication	CS-CS-0737	2	2	0	2	Core	NIL
5	Academic Report Writing	CS-CS-0738	2	2	0	2	Professional	NIL
6	Software Project Management	CS-CS-0739	3	1	4	5	Professional	CS-CS-0624
7	Islamic Studies-VII	CS-CS-0707	1	1	0	1	Inclusive	CS-CS-0607
	Total		17	12	10	22		

Automata Theory & Compiler Construction

Subject Name	Automata Theory & Compiler Construction
Subject Code	CS-CS-0736
Subject Status	Professional
Credits	03
Course Objectives	In Information Technology, it has a very broad application in a sense that every application in the background uses algorithms designed by this subject. In other words we can say that the computer really grown lip due to the waste application of this subject.
Reference Books	1. Introduction to computer Daniel I.A Cohen 2nd Edition 2. Introduction to Languages and Theory of Computation 3. Compilers , Principles , Technique and tools by i. Alfred V Aho ii. Ravi Sethi iii. Jeffery D.Ullman
Weeks	**Topics**
1st week	• **Automata Theory:** **Introduction: Why to study automata theory**

2nd week	• Introduction to languages, alphabets, strings, words, valid and invalid Alphabet, length of a string and reverse of a string etc. • Defining Languages Descriptive Definition of a language with examples.
3rd week	• Recursive Definition of Language with Examples, Kleene Star Closure Operator, Plus Operator, Powers of Alphabet, Union Intersection and Difference of Languages
4th week	• REGULAlEXPRE5SlONS with Examples • a) What is regular expression? • b) Recursive definition of RE • c) Examples of Languages with RE d) Equivalent RE, Regular Languages etc
5th week	• FINITE AUTOMATA • What are Finite automata, rules for Finite automata? • Transition table Transition diagram Conversion of RE to FA Examples
6th week	• TRANSIT ION GRAPH • a) What is TG? Rules of TG • b) Examples c) What are GTG rules?
7th week	Kleene's Theorem: Kleene's Theorem Part I, Part II and Part III
8th week	• Deterministic Finite Automaton, Conversion of NFA to DFA
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	• Part-II: Compiler • INTRODUCTION a. What is Translator , compiler and Interpreter
11th week	• b. Types of Compilers c. Function and uses of Compilers

12th week	• **d. Overview of the phases of Compiler** **e. Cousins of Compiler**
13th week	• **c) Compiler Construction Tools** • **d) Parts of Lexical Analysis** **e) Tokens , Lexemes and Pattern**
14th week	• **SYNTAX ANALYSIS** • **a) Roles of SA** **b) Describing Syntax using Regular Expressions (RE)???**
15th week	• **c) Context Free Grammar (CFG)** • **d) Some conventions for production rules** **e) Parse Tree**
16th week	• **LEXICAL ANALYZER** • **a) Introduction** • **b) Error and Steps for Manual Implementation** **c) Scanning Issues**
Final Term Exam	

Academic Report Writing

Subject Name	Academic Report Writing
Subject Code	CS-CS-0738
Subject Status	Professional
Credits	02
Course Objectives	Objectives: By the end of the course, students will be able to: 1. Demonstrate and apply knowledge of basic essay structure, including introduction, body and conclusion; 2. Employ the various stages of the writing process, including pre-writing, writing and re-writing 3. Employ descriptive, narrative and expository modes; 4. Demonstrate ability to write for an academic audience 5. Demonstrate understanding of and apply the principles of effective paragraph structure; 6. Write concise sentences;
Reference Books	1. Technical Report Writing by Jeffery
Weeks	**Topics**

1st week	Introduction to Academic Report Writing a) Writing Process
2nd week	10 Principles of academic report writing
3rd week	10 Principles of academic report writing,
4th week	Common types of academic documents
5th week	• Report • Essay • Paper
6th week	• a) Monographs • b) Thesis • c) Dissertation d) White Paper
7th week	Sequence of project report Sentence and paragraph formatting
8th week	Sequence and paragraph formatting
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	Capitalization
11th week	Punctuation
12th week	Kinds of punctuation marks
13th week	Academic Words
14th week	Paragraph and its types
15th week	• Plagiarism Paraphrasing
16th week	Project report's Tables, Diagrams, Graphs, and Pictures Referencing and Citing
Final Term Exam	

Software Project Management

Subject Name	Software Project Management
Subject Code	CS-CS-0739
Subject Status	Professional
Credits	03
Course Objectives	• A basic knowledge of software project management principles • The ability to come up with a project schedule and assign resources • Choose an appropriate project development methodology (e.g. waterfall, spiral …) • Identify project risks, monitor and track project deadlines • The capability to work in a team environment and be aware of different modes of Communications • Examine the software project management principles in real life scenarios • Be able to independently evaluate a particular topic of research interest and critically Analyze the issues
Reference Books	2. Software Project Management by Robert john 4th Edition

Weeks	**Topics**
1st week	Introduction What is software project management? Software project planning Who needs software? Who builds software?
2nd week	Project Management Vision and Scope Document Project Plan Statement of Work Risk Plan Estimation
3rd week	Project Principles Types of project Principles
4th week	Project schedules Elements of a Sound Estimate What is a project schedule? Scheduling concepts Building the project schedule Project metrics
5th week	Reviews When are reviews needed? Types of Review
6th week	PROJECT TIME MANAGEMEN Plan Schedule Management Define Activities Sequence Activities Estimate Activity Resources

7th week	Estimate Activity Durations. Network diagram Critical Path Method Develop Schedule Control Schedule
8th week	PROJECT SCOPE MANAGEMEN Plan Scope Management Collect Requirements
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	Define Scope Validate Scope Control Scope
11th week	PROJECT COST MANAGEMEN Plan Cost Management Estimate Costs. Determine Budget. Control Costs
12th week	PROJECT QUALITY MANAGEMENT Plan Quality Management Perform Quality Assurance Control Quality .
13th week	Software testing Quality, Test Plan, Test Case Diagnosing Problems Why Software Projects Fail.
14th week	Version Control Refactoring
15th week	Management and leadership Responsibility, authority and accountability
16th week	Manage the Organization Managing an outsourced project Prevent Project Failure
Final Term Exam	

Business Communication

Subject Name	Business Communication
Subject Code	CS-CS-0737
Subject Status	Core
Credits	02
Course Objectives	The objectives of this course are: a) To provide an overview of Prerequisites to Business Communication. b) To put in use the basic mechanics of Grammar. c) To provide an outline to effective Organizational Communication.

	d) To underline the nuances of Business communication. e) To impart the correct practices of the strategies of Effective Business writing.
Reference Books	3. Effective Business Communication 7th or latest edition by Herta A. Murphy
Weeks	**Topics**
1st week	What is communication?
2nd week	Kinds of communication, Verbal Communication, Non Verbal Communication
3rd week	Component of communication
4th week	Context, Sender-Encoder, Message
5th week	Medium, Receiver-Decoder, Feedback
6th week	Barrier of communication
7th week	Barriers to reception, Barriers to understanding, Barriers to acceptance
8th week	Seven communication skills
Mid Term Exam	
9th week	Correctness, Clarity, Conciseness
10th week	Completeness, Consideration, Concreteness, Courtesy
11th week	Appearance and design of message Personal letters, Business letters/ other social letters
12th week	Punctuation
13th week	Report writing, Purpose of writing, Procedure for Report Writing, PLANNING, WRITING
14th week	Formatting, revising, proof reading
15th week	Side activities:
16th week	Conversation dialogues, Reading Passages, Listening Comprehension
Final Term Exam	

مفردات مضمون: ثقافت اسلامی 7 (قرآنکریم وتکنالوژی معاصر)
سمستر: (هفتم)

Subject Name	مفردات مضمون: ثقافت اسلامی 7 (قرآنکریم وتکنالوژی معاصر)
Subject Code	CS-CS-0707
Subject Status	Inclusive
Credits	01

Course Objectives	نظام سیاسی عبارت از اصول و ارزشهای است که روابط انسانها ویا زندگی سیاسی انسانها را تنظیم می کند ودر روشنایی آن قوانین کشور ها تدوین میگردد.
Reference Books	کتاب مقرر : قرآن او معاصر علوم (کتاب) تالیف :دکتور مصباح الله عبدالباقی
Weeks	**Topics**
1st week	فصل اول: - مفهوم قرآن کریم - درلغت - دراصطلاح
2nd week	- مراحل نزول قرآن کریم. - مرحله اول از لوح محفوظ به اسمان دنیا - مرحله دوم از اسمان دنیا بالای رسول الله صلی الله علیه وسلم
3rd week	جمع آوری قرآن کریم - درعهد نبوت - دعهد ابوبکر الصدیق - درعهد عثمان بن عفان
4th week	تعریف ایه وسوره - سبب اختلاف در شمارش ایات - تعداد سورها وایات
5th week	- موضوعات قران کریم - نظریه ابو حامد الغزالی - نظریه شیخ رشید رضا - نظریه شیخ طاهر ابن عاشورا - نظریه ولی الله دهلوی
6th week	فضایل قران - خداوند متعال قران راتوصیف میکند - مواصفات قران در سنت - تاثرات یک دشمن الله در مورد قران کریم
7th week	- اهمیت قران در زندگی مسلمان - ترک تلاوت قران کریم گناه کبیره است - اداب تلاوت قران - فضیلت تلاوت قران کریم - چرا تلاوت قران ضروری میباشد، اداب تلاوت قران
8th week	معجزه ومفهوم آن - معجزه در لغت واصطلاح - شرایط معجزه و ویژگی های ان - دلالت معجزه پیامبر به پیامبری ایشان
Mid Term Exam	

9th week	انواع معجزه - معجزات حسی - معجزات عقلی - تفاوت بین معجزه پیامبر صل الله علیه وسلم وپیامبران گزشته - اعجاز قران کریم - اول :اعجاز غیبی قران (عیبیات ماضی،غیبیات حال، غیبیات اینده) - دوم: اعجاز تشریعی قران - سوم: اعجاز بیانی قران
10th week	- اعجاز علمی قران کریم - تعریف اعجاز علمی - نمونه های از معجزات قران کریم - مثال اول: خلقت و توسع کائنات
11th week	- مثال دوم(والسماء ذات الرجع) - هدف از (السماء)چیست؟ - اگر هدف از (السماء) کائنات وستاره ها باشد - اگرهدف از السماء لایه های گازی زمین باشد - لایه های گازی زمین
12th week	- اشکال مختلف رجع السماء - مثال سوم: اشکال کوها و وظیفه انها در قران
13th week	- مثال چهارم: مفهوم (والارض ذات الصدع) - تحقیق علمی در این مورد - اول: شق شدن خاک برای نبات - دوم: شکستن سنگریزه های قسمت خشکه زمین - سوم: درزهای موجود در کره زمین
14th week	- مثال پنجم - خلقت انسان - مراحل خلقت انسان - اعجاز علمی در این ایات
15th week	- مثال ششم - میوه ونبات - مثال هفتم: حائل میان بحرها
16th week	- مثال هشتم: اعجاز در محرمات غدائی مثال نهم: امراض جنسی واباحیت
Final Term Exam	

Eighth Semester Course Outlines

Eighth Semester

No	Subject	Code	Credit	Credit/Hours			Category	Prerequisite subject
				Lecture	Practical	Total		
1	Elective Subject-II	CS-CS-0834	3	1	4	5	Elective	NIL
2	Network Security	CS-CS-0840	3	1	4	5	Professional	CS-CS-0632
3	Research Methodology	CS-CS-0841	2	2	0	2	Professional	NIL
4	Human Computer Interaction	CS-CS-0842	2	1	2	3	Professional	NIL
5	Project (Monograph)	CS-CS-0843	6	0	12	12	Project	NIL
6	Distributed Database Concepts	CS-CS-0844	3	1	4	5	Professional	CS-CS-0417
7	Islamic Studies-VIII	CS-CS-0807	1	1	0	1	Inclusive	CS-CS-0707
	Total		20	7	26	33		

Distributed Database Concepts

Subject Name	Distributed Database Concepts
Subject Code	CS-CS-0844
Subject Status	Professional
Credits	03
Course Objectives	Database is used by every small and large company using different technologies. Replication of data is used to create additional instances of data in different parts of the database. Using this tactic, a distributed database can avoid excessive traffic because the identical data can be accessed locally.
Reference Books	4. Principle of Distributed database systems 2nd edition Author: M. Tamer Ozsu, PatericKValduriez
Weeks	**Topics**
1st week	Introduction to databases. Introduction to DBMS. Relational databases and RDBMS
2nd week	Object relational database management system Difference between relational database and flat file system. Introduction to Distributed Database Systems and History. Distributed Computing, Objectives, Theoretical Aspects
3rd week	Definition of Distributed Database Systems, Compulsory Parts, Main Characteristics, Objectives Definition of Distributed DBMS and Decentralized Database Resembling Setups.

4th week	Reasons for DDBS and Promises of DDBMS Reliability of DDBS, The Concept and Role of the Transaction in Distributed Computing, Performance Improvement, Complicating Factors
5th week	Background of RDBMS, Relational Data Model, Keys, Tables, Dependencies Structure
6th week	Normalization Relational Data Languages
7th week	Derived Relational Algebra, Relational Calculus DDBMS Architecture
8th week	DDBS Architecture, Dimensions, Architectural Alternatives Major DDBS Architectures
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	Global Schema Architecture, Global Data Dictionary, DDB Design, Distribution Design Issues, Fragmentation(Advantages & Disadvantages)
11th week	Correctness Rules for Fragmentation, Horizontal & Vertical Fragmentation Minterm Predicates
12th week	serializability theory in DDBS Basic Concept of Query Optimization.
13th week	Query Processing in Centralized and Distributed DBS Query Decomposition and its Phases
14th week	Final Phase of QD, Data Localization Query Optimization
15th week	Parallel Database Systems Parallel Processing Basics
16th week	Parallel Data Processing, Parallel Query Optimization Distributed Object-Oriented Database Systems
Final Term Exam	

Research Methodology

Subject Name	Research methodology
Subject Code	CS-CS-0841
Subject Status	Professional
Credits	02
Course Objectives	Research is a systematic way to solve a problem. Research methodology is the science of studying how research is to be carried out. Its aim is to give the work plan of research. Different research methods have different purposes and different level of validity.
Reference Books	
Weeks	**Topics**

1st week	Introduction, Definition & Value of Research Scientific Method of Research & Its Special Features Classification of Research
2nd week	Theory and Research Concepts Variables and types of variables
3rd week	Hypothesis Testing and Characteristics Review of Literature Conducting a Systematic Literature Review
4th week	Theoretical Framework Problem Definition & Research Proposal
5th week	The research process Ethical issues in research
6th week	Measurements of concepts
7th week	Criteria for good measurement Research design
8th week	Survey research Intercept Interviews in Malls and other high-traffic area Self-Administered Questionnaire
Mid Term Exam	
9th week	امتحان وسط سمستر
10th week	Tools for data collection Pilot testing of the questionnaire
11th week	Interviewing Sample and sampling terminology Probability and non-probability sampling Types of probability sampling
12th week	Data analysis Data transformation
13th week	Data presentation The parts of the table
14th week	Experimental research
15th week	Non-reactive research Use of secondary data
16th week	Qualitative research: observation studies/field research
Final Term Exam	

Human Computer Interaction (HCI)

Subject Name	Human Computer Interaction (HCI)
Subject Code	CS-CS-0842
Subject Status	Professional
Credits	02

Course Objectives	Computer is one of the most fast growing technology of the world, Each and every day a lot of improved emerging in both software and hardware of the computer. Human-Computer Interaction (HCI) is the study of how people use computers throughout their lives. HCI research seeks to develop user interfaces that are useful, usable, and enjoyable. It focuses on activities ranging from design to development to evaluation of computer systems, with a goal of understanding how computers and technology affect people and society.
Reference Books	1). Human-Computer Interaction 3rd edition. Author: Alan Dix 2). Interaction Design: Beyond Human-Computer Interaction 1st edition Author: Preece, Jenny
Weeks	**Topics**
1st week	Foundations of Human-computer interaction Human capabilities
2nd week	The computer. The interaction. Paradigms.
3rd week	Goals and Evaluation of Human computer interaction Discipline of Human computer interaction
4th week	The design process. Interaction design basics. HCI in the software process.
5th week	Design rules. Universal design.
6th week	Implementation support and implementation tools
7th week	Evaluation and user support 1). Evaluation 2). User support
8th week	User models Cognitive frameworks
Mid Term Exam	
9th week	Socio organizational issues and stakeholder requirements Cognitive Process
10th week	Task models and dialogs Analyzing tasks Dialog notations and design
11th week	Human Input- output channels The psychology of actions
12th week	Computer devices Interaction frameworks and styles
13th week	Evaluation Behavior and form
14th week	Users
15th week	Information retrieval

16th week	Emerging paradigms
Final Term Exam	

مفردات مضمون: ثقافت اسلامی 8 (تمدن اسلامی)

Subject Name	مفردات مضمون: ثقافت اسلامی 8 (تمدن اسلامی)
Subject Code	CS-CS-0807
Subject Status	Inclusive
Credits	01
Course Objectives	نظام سیاسی عبارت از اصول و ارزشهای است که روابط انسانها ویا زندگی سیاسی انسانها را تنظیم می کند ودر روشنایی آن قوانین کشور ها تدوین میگردد.
Reference Books	کتاب مقرر : قرآن او معاصر علوم (کتاب) تالیف :دکتور مصباح الله عبدالباقی
Weeks	**Topics**
1st week	تعریف تمدن واصطلاحات نزدیک به آن ، نگاهی به ادوار تمدن های بشری الی تمدن یهود
2nd week	گسترش تمدن ها، مفاهیم کلیدی تمدن اسلامی وریشه های آن
3rd week	عوامل آفرینش تمدن
4th week	قوانین پیشرفت و ویژگیها وبرتری های تمدن اسلامی : توجه همه جانبه به فراگیری علم ودانش
5th week	تمدن انسانگرا ودیگر پذیری ورفتار نیکو با غیر مسلمانان
6th week	برابری و دوری از تبعیض، مراعات اخلاق ، آداب جنگ ،دست آورد های تمدن اسلامی: علوم طبیعی وساینس:علوم ریاضی
7th week	علوم طبیعی وعلوم انسانی
8th week	نظام سیاسی ونظام اقتصادی
Mid Term Exam	
9th week	نظام قضایی ونظام اخلاقی واجتماعی
10th week	نظام آموزش وپرورش، نهاد های خیریه، شفاخانه ها
11th week	پایتخت ها وشهر های بزرگ
12th week	صنعت در تمدن اسلامی
13th week	عوامل ضعف تمدن اسلامی
14th week	راه ها وچگونگی باز سازی تمدن اسلامی
15th week	ارزشهای گفتمانی تمدن اسلامی
16th week	تکرار
Final Term Exam	

Elective Subjects

Note

There are total five elective subjects namely ASP.net, Computer Graphics, Digital Signal Processing, Financial Accounting, and Management Information System. The first two elective subjects belong to seventh semester and their ID is **CS-CS-0736**. Last three elective subjects belong to eighth semester and their ID will be **CS-CS-0836.** Students can select any of the elective subjects of their choice. These elective subjects are changeable because we need to look at the market need or new technology needs, so according to the need these subjects maybe selected.

ASP.net

Subject Name	ASP.net
Subject Code	CS-CS-0736
Subject Status	Elective
Credits	03
Course Objectives	ASP.NET. ASP.NET is an open-source server-side web application framework designed for web development to produce dynamic web pages. As a member of the .NET framework, ASP.NET is a very valuable tool for programmers and developers as it allows them to build dynamic, rich web sites and web applications using compiled languages like VB and C#.
Reference Books	Beginning ASP.NET 4.5.1: In C# and VB Author: ImarSpaanjaars Professional ASP.NET MVC 5 Author: Jon Galloway and Brand Wilson uu.
Weeks	**Topics**
1st week	Introduction to ASP.NET, From ASP to ASP.NET, Web Forms Web Services, ASP.NET Features
2nd week	Web Forms Architecture, Page Class, Web Forms Life Cycle Web Forms Event Model, Code-Behind
3rd week	ASP.NET and HTTP, Request/Response Programming, HttpRequest Class HTTP Collections, HttpResponse Class, Redirection, HttpUtility Class
4th week	Web Applications Using Visual Studio, Using Visual Web Developer, Visual Studio Forms Designer, Using Components, Shadow Copying Using the Global.asax File, Data Binding

5th week	State Management and Web Applications, Session State, Application State Multithreading Issues, Cookies
6th week	Server Controls, HTML Server Controls, Web Forms Server Controls, Rich Controls, Validation Controls User Controls
7th week	Caching in ASP.NET, What Is Caching, Page-Level Caching, Page Fragment Caching, Optimizing Your ASP.NET Application Application Caching
8th week	ASP.NET Configuration and Security Fundamentals, Configuration Overview Authentication and Authorization, Forms Authentication, Windows Authentication, Security and ASP.NET
9th week	Debugging, Diagnostics and Error Handling, Debugging, Application Tracing Page Tracing, Error Handling
10th week	More Server Controls, Most recent ASP.NET Controls, Menus Master Pages
11th week	ADO.NET and LINQ, ADO.NET Overview, .NET Data Providers, Connections Commands, DataReaders and Connected Access, Data Sets and Disconnected Access, Language Integrated Query
12th week	Data Access in ASP.NET, Data Source Controls, Connection String Storage, GridView, DetailsView, FormView, Object Data Sources, ListView, DataPager LinqDataSource
13th week	Personalization and Security, Configuration Overview, Themes Skins, Security in ASP.NET, Membership and Roles Login Controls, User Profiles
14th week	Introduction to ASP.NET AJAX, Rich Client Applications AJAX, ScriptManager, UpdatePanel
15th week	AJAX Client Library, Remote Method Calls, AJAX Control Toolkit, HTTP Pipeline Pipeline Architecture, Context
16th week	Applications, Handlers, Modules
Final Term Exam	

Computer Graphics

Subject Name	Computer Graphics
Subject Code	CS-CS-0736
Subject Status	Elective
Credits	03
Course Objectives	Computer Graphics I is a study of the hardware and software principles of interactive raster graphics. Topics include an introduction to the basic concepts, 2-D and 3-D modeling and transformations, viewing transformations, projections, rendering techniques, graphical software packages and graphics systems. Students will use a standard computer graphics API to reinforce concepts and study fundamental computer graphics algorithms.
Reference Books	vv. Wireless Communication Networks and Systems, by Cory Beard and William Stalling
Weeks	**Topics**
1st week	Introduction, Motivation, Uses, History
2nd week	Graphics Systems and Models
3rd week	Graphics Programming : Getting started with OpenGL
4th week	Input and Interaction in OpenGL
5th week	Geometrical Objects and Transformations in 2D and 3D, homogeneous coordinates, matrix representation, windows and viewports
6th week	Viewing in 3D, projections, hidden surface removal
7th week	Light, shading and materials. Illumination and Shading, light sources, (surface detail, ray tracing, radiosity)
8th week	Introduction, Motivation, Uses, History
9th week	Graphics Systems and Models
10th week	Graphics Programming : Getting started with OpenGL
11th week	Routing II: Geographic and Diversity Routing in Mesh Networks
12th week	Programmable shaders : OpenGL shading language, fragment shaders, cub and bump maps.
13th week	Modelling Techniques, trees, scene graphs.
14th week	From Vertices to Fragments : modeling, geometry processing, rasterization, fragment processing. Clipping, hidden surface removal, antialiasing.
15th week	Discrete techniques: buffers, bit and pixel operations, texture mapping, compositing.

16th week	Programmable shaders : OpenGL shading language, fragment shaders, cub and bump maps.
Final Term Exam	

Digital Signal Processing

Subject Name	Digital Signal Processing
Subject Code	CS-CS-0836
Subject Status	Elective
Credits	03
Course Objectives	In this course, we will mainly study the following topics: signal representation in time domain, Fourier transform, sampling theorem, linear time-invariant system, discrete convolution, z-transform, discrete Fourier transform, and discrete filter design.
Reference Books	Richard G. Lyons, Understanding Digital Signal Processing, Prentice Hall. S. W. Smith, The Scientist and Engineer's and Guide to Digital Signal Processing, California Technical Publishing
Weeks	**Topics**
1st week	Discrete-time signals as sequences Properties of discrete-time systems
2nd week	Linear time-invariant systems Difference equations
3rd week	Frequency domain and Fourier transforms
4th week	Frequency domain representation of sampling Reconstruction
5th week	Multirate signal processing A/D and D/A conversion
6th week	Definition of the z-transform Convergence
7th week	Inverse z-transform Properties
8th week	Frequency response System functions
9th week	Structures for FIR and IIR filters
10th week	IIR systems FIR – windowing methods
11th week	FIR – optimal approximation methods
12th week	DFT
13th week	Discrete cosine transform
14th week	Fast Fourier transform

15th week	Analysis of magnitude and phase
16th week	Quantization and noise
Final Term Exam	

Financial Accounting

Subject Name	Financial Accounting
Subject Code	CS-CS-0836
Subject Status	Elective
Credits	03
Course Objectives	Any organization that deals with money or money's worth needs to record every transaction that it enters into. The courses in this product give a complete understanding, right from scratch to preparation and analysis of financial statements. The product is supplemented with a number of interactive exercises, in accordance with the 'learn by doing' approach.
Reference Books	A practical guide for preparing and mastering financial budgets Jame O Brien- Tata Mcgraw Hill
Weeks	**Topics**
1st week	Meaning, Functions and Sub fields of Accounting Accounting Cycle Accounting Principles- Concepts & Conventions Accounting Equation Types of Accounts Rules of Debit & Credit
2nd week	Analyzing transactions Recording transactions Posting to ledger Balancing the accounts Preparing Trial Balance
3rd week	Rectifying the erroneous entries Journalizing adjustment entries Preparing Adjusted Trial Balance Passing the closing or transfer entries Preparing financial statements
4th week	Categorization of ratios Various types of ratios including Liquidity Ratios, Solvency Ratios, Structure Ratios, Leverage Ratios, and Coverage Ratios. Significance of these ratios

5th week	Various other types of ratios including Profitability Ratios, Expense Ratios, Turnover Ratios, and Market Sensitivity Ratios. Decomposition of ROA and ROE with Dupont Analysis Limitations of ratio analysis
6th week	What actually is Bank Reconciliation? Reasons for reconciling the books. Procedure or steps for reconciliation.
7th week	Petty cash and its purpose Writing petty cash book Types of petty cash book Control over petty cash
8th week	The basics of inventory Inventory accounting systems Inventory valuation methods Accounting for inventory Inventory and its impact on financial statements.
9th week	The basic concepts of depreciation The methods of depreciation Accounting for depreciation Depreciation and its impact on cash flow and income tax.
10th week	MIS personnel must understand the business problem and also know the technologies involved in addressing that business problem. MIS personnel must then be able to describe potential information technology solutions to the users, without the use of MIS jargon and acronyms.
11th week	The basic concepts of depreciation The methods of depreciation Accounting for depreciation Depreciation and its impact on cash flow and income tax
12th week	The course provides a distinction between operating and trade debt related to operating and financing activities. It explains debt issuance (in particular zero coupon bond)/amortization effects on financial statements and financial ratios.
13th week	The course also elaborates the effect of changing interest rates on the market value of debt as well as on financial statements and ratios. Lastly, the course describes the concept of retiring debt and debt covenants from various perspectives.
14th week	The course explains the fundamentals of lease financing and focuses on various forms of off-balance-sheet financing. Further, it differentiates between operating and financial leases. It makes the user understand the impact of lease financing on accounting system of a concern and its ratios.
15th week	The course also expounds the lease accounting calculations. Also, it describes various other forms of off-balance-sheet financing like sales receivables and take-or-pay contracts.

16th week	Accounting policies adopted by a company (such as method of depreciation, valuation of inventories etc.) influences the financial statements and thereby the pre-tax income and the income tax payable. When the tax reporting and financial reporting differs, it leads to differences in income and deferred tax liabilities.
Final Term Exam	

Management Information System

Subject Name	Management Information System
Subject Code	CS-CS-0836
Subject Status	Elective
Credits	03
Course Objectives	Provide students with comprehensive knowledge and technical skills needed to successfully participate in and support the increasingly applied role of information technology in corporate decision making,
Reference Books	Management Information Systems – Managing the Digital Firm – Tenth Edition, Kenneth C. Laudon and Jane P. Laudon Management Information System- Jame O Brien- Tata Mcgraw Hill Introduction to Computers – Latest Edition by Peter Norto
Weeks	**Topics**
1st week	Systems, data and information and knowledge Importance of MIS in the competitive business environment.
2nd week	• Database Management System • Networking • Systems & Application Software
3rd week	• Management information systems, transactions processing systems, decisions support systems, expert systems, office automation systems and knowledge-based systems • Structured decision making, unstructured decision making and semi structured decision making
4th week	• Stages of SDLC • Feasibility study, systems study and systems design • Resource utilization, implementation, audit, operation, maintenance and modification
5th week	Marketing, Finance, HR, Production/Operations information systems
6th week	• Process Mapping • Implementation Management • ERP System
7th week	Computer Information Systems) is the major that studies all systems and capabilities Necessary to manage, use, transport, and process information as a resource to theorganization.

8th week	MIS personnel are employees in the Information Systems department. They may becentralized in a data center, or assigned to a user group in one of the functional areas. Users are everyone else in the organization.
9th week	Communications between MIS personnel and users is a two-way street. Users must knowwhat their business problem is and be able to effectively articulate it.
10th week	MIS personnel mustunderstand the business problem and also know the technologies involved in addressing thatbusiness problem. MIS personnel must then be able to describe potential informationtechnology solutions to the users, without the use of MIS jargon and acronyms.
11th week	Routing II: Geographic and Diversity Routing in Mesh Networks
12th week	Programmable shaders : OpenGL shading language, fragment shaders, cub and bump maps.
13th week	Modelling Techniques, trees, scene graphs.
14th week	From Vertices to Fragments : modeling, geometry processing, rasterization, fragment processing. Clipping, hidden surface removal, antialiasing.
15th week	Discrete techniques: buffers, bit and pixel operations, texture mapping, compositing.
16th week	Programmable shaders : OpenGL shading language, fragment shaders, cub and bump maps.
Final Term Exam	

www.salam.edu.af

Mob: +93(0)788 275 275

KolulaPushta Rd, Kabol, GuliSurkh Square, Kabul Afghanistan

نصاب هذا در کمیته نصاب دیپارتمنت کمپیوتر ساینس در جلسه مورخ..... تحت پروتوکول شماره.... مورد تایید قرار گرفت. امضاء مسؤل کمیته

نصاب فعلی دیپارتمنت کمپیوتر ساینس در کمیته شورای علمی دیپارتمنت در جلسه مورخ..... تحت پروتوکول نمبر..... تایید گردید. امضاء مسؤل کمیته

نصاب هشت سمستر دیپارتمنت کمپیوتر ساینس در جلسه مورخ ..... تحت پروتوکول نمبر ..... شورای علمی پوهنحی کمپیوتر ساینس مورد تایید قرار گرفت. امضاء مسؤل کمیته

نصاب تحصیلی دیپارتمنت کمپیوتر ساینس در جلسه مورخ ..... و تحت پروتوکول نمبر ..... کمیته نصاب مرکزی پوهنتون مورد تایید قرار گرفت. امضاء مسؤل کمیته

نصاب تحصیلی فوق در جلسه مورخ ..... و تحت پروتوکول نمبر ..... شورای علمی پوهنتون مورد تایید قرار گرفت. امضاء مسؤل کمیته