

COMPUTER SCIENCE DEPARTMENT

Study Plan of Bachelor Degree in Computer Science

ABOUT THE COMPUTER SCIENCE DEPARTMENT:

The department began working with the beginning of the establishment of the university as it provides the student with the necessary knowledge and skills to work in the field of programming, the use of computer networks, and the development of computer systems.

Programm Objectives

The objective of the B.Sc. in CS program is to produce graduates that will be able to:

- 1- Serve his/her society.
- 2- Communicate and function effectively in a professional environment.
- 3- Identify and work in contemporary issues in computer science fields.

ACADEMIC PROGRAM SPECIFICATION

1 - PROGRAMME IDENTIFICATION AND GENERAL INFORMATION:

Educational Institution	ALREEFAK UNIVERSITY
Department	Computer Science Department
Programme Title	BSc in Computer Science
Programme Code	CPS
Duration of Study	Normally 8 Semesters (4years)
Conditions for enrollment	Higher school certificate of 65% and above + passing the entrance exam
Mode of Attendance - Study system	Full Time - Open semester system
Degrees awarded by the department	Bachelor's degree(BSc) in Computer Science
Degree requirements	Completion of 142 credit hours
Total Credit hours	142 Credit hours
Teaching language	English / Arabic
Program Coordinator	
Programm location	Main campus
Programm establishment date	15.03.2003
Date of Program accreditation	04.07.2009
Program Accreditation Authority	Libyan Quality Assurance center
Date written/revised:	02/04/ 2018

2-EXPECTED STUDENT OUTCOMES

Impart an understanding of the basics of our discipline.

Each graduated student should be able to:

- Apply fundamental principles and methods of Computer Science to a wide range of applications.
- Apply mathematical and scientific reasoning to a variety of computational problems.
- Design, correctly implement and document solutions to significant computational problems.

Develop proficiency in the practice of computing.

Each graduated student should be able to:

- Formulate solutions to computing problems.
- Analyze and compare alternative solutions to computing problems.
- Design and implement software systems that meet specified design and performance requirements.
- Apply advanced algorithmic and mathematical concepts to the design and analysis of software.
- Apply sound principles to the synthesis and analysis of computer systems.

Prepare for continued professional development.

Each graduated student should be able to:

- Work effectively in teams to design and implement solutions to computational problems.
- Communicate effectively, both orally and in writing.
- Think critically and creatively, both independently and with others.
- Recognize the social and ethical responsibilities of a professional working in the discipline.
- Adapt to new developments in the field of computer science.

3- PROGRAM AIMS

- Enable graduates to exhibit a high level of practical and theoretical skills over a broad range of Computer Science together with knowledge of currently available techniques and technologies.
- Explore the principles that support developments in a rapidly changing environment.
- Provide opportunities for students to understand the wide range of research challenges facing Computer Science, as well as the breadth and depth of research undertaken in this top-rated school, so they are prepared to get on research here or elsewhere.
- Develop competent professionals able to play a leading part in many different commercial, industrial and academic activities and adapt rapidly to changing technology.
- Meet industry demand for high caliber graduates who will take a lead in continuing technological change.
- Prepare students for the social, organizational and professional context in which they will be working.

4-INTENDED LEARNING OUTCOMES (ILOs)

A- Knowledge and Understanding

- A1. Apply the basics of Physics& Discrete Mathematics.
- A2. Describe and model Mathematical Problems.

- A3. Apply the Statistical Methods.
- A4. Describe the Modeling Problems.
- A5. Define the basics of Computer Systems.
- A6. Apply Programming to solve Problems.
- A7. Apply the Problem Solving Techniques.
- A8. Recognize Operating Systems Designs.
- A9. Apply the Data Analysis process.
- A10. Recognize Artificial Intelligent Principles.
- A11. Represent essential knowledge of Computer Graphics.
- A12. Recognize Computer Networks.
- A13. Outline the principles of Software Engineering.
- A14. Apply the principles of Object-Oriented Programming.
- A15. Recognize the logic of Digital Circuits.
- A16. Apply the principles of Internet Technologies.

B- Intellectual Skills

- B1. Think in a creative and innovative way in problem solving and design.
- B2. Select appropriate Mathematical method to solve a specific problem.
- B3. Develop Analytical Skills.
- B4. Use software tools to develop computer programs for engineering applications.
- B5. Collaborate Modeling and Simulation.
- B6. Diagnose the potential and the limitations of Computers.
- B7. Create computer algorithms to solve different problems.
- B8. Design and implement Programming methods.
- B9. Plan, conduct and present Software Projects.
- B10. Focus, gather information, integrate, and evaluate the data for Problem Solving.
- B11. Work effectively, independently or as a part of a team.
- B12. Examine problems carefully and effectively.
- B13. Devise a solution to practical problems.
- B14. Design software solutions to real world problems.
- B15. Design and analyze Problems.
- B16. Plan, conduct and write a technical report on a project or an assignment.

C- Professional & Practical Skills

- C1. Choose the appropriate Programming Language.
- C2. Choose the appropriate Operating system.
- C3. Communicate effectively.
- C4. Lead a team and Work in a team.
- C5. Acquire information independently.
- C6. Present effectively in a Seminar.
- C7. Prepare Technical Reports.
- C8. Investigate and use of Information Technology skills.
- C9. Design computer-based systems.
- C10. Develop computer-based systems.
- C11. Evaluate systems in terms of quality attributes.
- C12. Apply principles of effective information management.

- C13. Investigate different techniques of information retrieval.
- C14. Deploy the tools for software projects documentation.
- C15. Discover efficient design of human-computer interfaces.
- C16. Design of web pages based on the principles of human-computer interactions.
- C17. Design multimedia systems based on the principles of human-computer interactions.
- C18. Discover efficient design of computer-based systems.

D-Transferable and Generic Skills

- D1. Practice Communication skills in English.
- D2. Practice Independent Learning techniques.
- D3. Use different Problem solving techniques.
- D4. Follow Analytical Thinking.
- D5. Follow Creative Thinking.
- D6. Use Modeling capability in software projects.
- D7. Use Effective reasoning in problem solving.
- D8. Practice Management Skills.
- D9. Follow ethics in research and work.
- D10. Clarify Ideas formulation and presentation.
- D11. Use Logical inference in problem solving.
- D12. Practice Designing skills in software projects.
- D13. Practice Engineering skills for software development.

5-Learning and Teaching Methods

1. Lectures & Tutorials
2. Computer-lab Sessions
3. Practical lab work
4. Class discussions and activity.
5. Internet searches
6. Problem-based Learning
7. Working in small groups
8. Field visits and field training.
9. Case Study.

6-Assessment Methods

1. Final written exams.
2. Midterm exams.
3. Final Lap exams.
4. Quizzes.
5. Writing scientific reports
6. Seminars.
7. Home works.
8. Project discussion committees.
9. Tutorial and report assessment
10. Observation.

Grading System

The following percentages shall be used to determine candidates' overall gradings:

Code in English	Code in Arabic	Grading	Marks
A	أ	Excellent	%100-85
B	ب	Very Good	%84-75
C	ج	Good	%74-65
D	د	Pass	%64-50
F	و	Fail	%50 Less than

7-Criteria for Admission

1. Applicants must satisfy the University's general entry requirements.
2. Passing the department acceptance test.
3. Health Fitness.
4. Department capacity.

8-Support for Student Learning

The department support of student learning by:-

1. All students have a senior tutor who will provide support including pastoral and welfare.
2. The year directors and head of department are available to give help and advice.
3. Students work in pairs on the projects, which are supervised by a member of academic staff.
4. Most courses provide printed lectures notes, problems sheets and practical exercises and also can be obtained from the departmental office and website.
5. Members of staff are happy to give help and advice.
6. The department runs teaching laboratories and each laboratory has a coordinator who reports to senior academics.
7. A member of quality assurance in university will visit the student during the course to ensure satisfactory program.
8. There is library provision and computer room within the department and at college level.
9. In the final year, students will have a local project supervisor, with whom they will meet regularly and he will be responsible for their activities.
10. Library services.
11. Careers Advisory Service.

9-Methods for Evaluating and improving the standard of Learning and Teaching

The quality of the program:

1. Students provide a feedback at the end of unit, which are used to review and improve the unit.
2. The department management board and academic staff with students, which meets regularly and provides a forum where any aspect of the teaching can be discussed.
3. Student membership of the department and faculty management board.
4. The discussions of the students with personal tutors and the Directors of Studies for each year.

10-Assuring and enhancing the quality of the program:

1. The program is periodically reviewed by external examiners.
2. Annual evaluation of each unit by the coordinator.
3. Periodic program reviews by academic staff.
4. External check up by the Quality Assurance of college.
5. The department external advisory panel, which includes representatives from students and industry and advisers on this course.
6. All academic staff regularly undergo observation of their teaching by colleagues.

11-Key Sources of Information about the Program

1. Market needs.
2. Field studies and questionnaires.
3. Seminars and workshops with beneficiaries.

12-Methods for evaluating the standard of Learning and Teaching of lecturer

1. Evaluation of academic staff member by the head of department according to form No. 1.
2. Evaluation of academic staff member by students according to form No. 2.
3. Self-evaluation of academic staff member in accordance with the form No. 3.
4. Evaluation of academic semester units by students according to form No. 4.
5. The evaluation process are supervised by a head of quality assurance at the university.

13-Methods for Evaluating and review the Program Structure

1. Forming a committee to follow up the program.
2. Student opinion survey on the program.
3. Faculty members' opinion survey on the program.
4. Follow-up the application of the program by the University Quality Assurance Office.
5. Review the program every four years.

14-Selection of academic staff members

1. The selection of experienced and distinguished academic staff members.
2. Selection of faculty members according to quality standards.
3. Conducting personal interviews for the selection of faculty members.

15-Academic program management requirements

1. The presence of an identification bulletin for the department containing the vision, mission and objectives.
2. Having a head of department with appropriate academic and management experience.
3. The existence of a scientific council of the department to organize its work.
4. Students' participation in decision-making.
5. Providing qualified technical and administrative staff to serve the program.
6. Provide a good archive for the department.
7. The existence of a mentoring program for new students.
8. Academic support for students.

16- PROGRAM STRUCTURE

Study Plan for the Computer Science 2021

The Bachelor Degree in Computer Science is awarded at Alrefak University after the successful completion of 142 credit hours distributed as follows:-

Table 1: Distribution of credit hours

Requirements	Credit hours			No. of Courses	Weight %
	Mandatory	Elective	Total		
University Requirements	10		10	5	12.5
Departmental Requirements	126	6	132	35	87.5
Total	136	6	142	40	100

1. University Requirements (10 CHs): as shown in table 2:

Table 2: University Mandatory Requirements courses

Course Number	Course Title	Credit Hours	Lecture	Practical	Prerequisite
GHS131	Political Sciences	2	2	-	
GHS141	Arabic Language	2	2	-	
GHS143	English Language I	2	2	-	
GHS144	English Language II	2	2	-	GHS143
GHS203	Islamic Culture	2	2	-	

2. Department Mandatory Requirements (126 CHs) shown in table (3):

Table (3):

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	La b	
GS101	Mathematics 1	3	3	-	
GS102	Mathematics 2	3	3	-	GS101
GS105	Statistics and probability	4	4	-	GS102
CS110	Fundamental of Electrical circuits	4	4		
CS111	Introduction to Programming	4	3	2	
CS112	Introduction to Computer	3	3		
CS113	Introduction of Digital Systems	4	4		CS110
CS131	Systems Analysis	4	3	2	CS111 + CS112
CS141	Discrete Structures	3			GS102
CS214	Computer Organization	4			CS113 +CS112
CS215	Assembly Language	4	3	2	CS113 +CS112
CS216	Operating systems	4	4		CS214
CS222	C – Language	4	3	2	CS113
CS223	Visual ProgrammingI	4	3	2	CS320/GH142
CS232	Software Engineering	4	4		CS131
CS242	Numerical methods and programming	4	3	2	CS307
CS251	Data Structures 1	4	3	2	CS207/GS101
CS271	Database management	4	3	2	GS204
GS203	Linear Algebra	3	3		
CS317	Computer Architecture	4	4		CS203
CS324	DELPHI.	4	3	2	CS202

CS325	Object Oriented Programming	4	3	2	CS322
CS326	Visual Programming 2	4	3	2	CS210
CS327	Java	4	3	2	
CS352	Data Structures 2	4	3	2	CS212
CS353	Modeling and simulation	4	3	2	GS105 CS251
CS354	Systems Programming	4	4		CS421
CS381	Computer networks	4	4		CS319
CS391	Elective 1	4	4		
CS392	Elective 2	4	4		
CS401	Research methods &Field training	2	2		
CS402	Graduation Project I	4	4		Completion of 115 CHs
CS455	Artificial Intelligence	4	3	2	
CS456	Computer graphics	4	3	2	
CS461	Web design (Internet programming)	3	2	2	

3-Elective Department Courses (6 CHs) shown in table 4.

Table (4): Elective Department Courses

Course Number	Course Title	Credits Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
	Compiler Design	4	4		
	Game Design and Development	4	3	2	
	Advanced Topics in Programming	4	4		
	Information Retrieval Systems	4	4		
	Special Topics in Computer Science	4	4		

Prepared by	Checked by	Approved by
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