Bachelor of Computer Science (BCS) Program Handbook

Computer Science Department
College of Computing and Information Technology

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The field of Computing is one of the most advanced scientific fields that has influenced all aspects of modern life. Continuous development has become one of the most important features of this field in which all scientific and applied efforts are focused. As the computer stands at the top of the knowledge pyramid in this age due to the rapid technological development, it becomes important for all the institutes to adapt to this particular curriculum. Therefore, the College of Computing and Information Technology in Shaqra University intends through the available programs and disciplines to meet the increasing needs of requirements in the field of computer science and information technology by graduating their students with good knowledge in the field of computer science. The main emphasis is given on providing theoretical and practical knowledge to compete in the labor market in light of the strong competition and rapid development witnessed by Saudi Arabia and the world at a major level. The college of computing and Information Technology also seeks to qualify graduates to complete their higher studies and join the elite researchers interested in the field of technology and computer science. As a newly established college, the prime focus is to identify the potential of the organization. In order to achieve this, we are working on the continuous development of the science curriculum and developing students' learning skills and attracting outstanding faculty members so that we can move towards achieving the goals of the College at a confident pace.
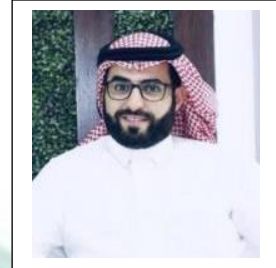
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Technology is a real force of change that stands behind most of the rapid developments in all aspects of life. As a result, the demand for highly skilled graduates has increased. To meet these requirements, the Agency for Educational Affairs at the College of Computing and Information Technology (CCIT) at Shaqra University seeks to provide modern, effective and sophisticated curriculum similar to those offered by other major educational institutions around the world who are able to keep pace with the rapid development of information technology. Currently, the College offers a Bachelor's Degree in Computer Science, Computer and Network Engineering, Information Technology, and Information Systems. The College's Educational Affairs Agency is also on the way to complete the requirements of local academic accreditation by the National Center for Assessment and Accreditation (NCAAA) and international academic accreditation by the Engineering Accreditation Council (ABET). In order to improve the educational process and provide it in an organized manner and based on high-quality international standards the educational affairs are trying hard to acquire such international level certificates. Thus, we can ensure that the college student shall be of immense importance. The College also strives to promote scientific research at the College, where we work to achieve leadership and excellence in both quantitative and qualitative terms, and to encourage joint research work and promote the exchange of scientific expertise and research among faculty members at the College. In view of the university's tendency to encourage graduate studies and scientific research, the college is in the process of opening two master's programs in cybersecurity and assurance, and in data science and artificial intelligence, and shall be applying for the opening of a doctoral program.

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No one can imagine living today without computers. It dominates all of our daily activities, starting from very simple to very complicated activities. The need for computer scientists appears clearly in all fields including artificial intelligence and software development projects. The contribution of computer scientists can also be seen in the development web and mobile applications, artificial intelligence solutions, game design, and so on. Indeed, it is very rare today to see a device or a piece of equipment that is not entirely or at least partially designed by computer scientists. In the Kingdom of Saudi Arabia, most of the various infrastructure projects have been developed during the last three decades. Computer scientists have been part of executing these projects. However, there is still a lack of computer scientists to contribute and push the wheel of development in the Kingdom of Saudi Arabia. Since the establishment of the Computer Science at Shaqra University, the department has been/will be committed to providing qualified computer scientist with valuable skills that should participate in the attainment of the vision of the Kingdom of Saudi Arabia 2030.

Brief on Bachelor of Computer Science (BCS) Program

The College of Computing and Information Technology has established in 1434 Hijri -2014 AD, and in turn, it emphasizes the provision of the best means of education and research that serve the community and become an effective partner in the industry. The Bachelor of Computer Science (BCS) program was implemented since the establishment of the college. Since then, six batches of students have graduated from the programduring the academic years (1438 –1439 –1440 –1441 –1442 –1443 Hijri), given that admission to new students is only given at the first semester of the academic year. In terms of education, the program provides a broad knowledge in the field ofdifferent computer science branches such as artificial intelligence and software development sectors. The College and the Computer Science department aim to establish a close relationship between professors and students and provide a university atmosphere that helps creativity, performance, acquisition of advanced knowledge, and practical skills in many important computer science fields. Through the programwith a team of highly experienced instructors (i.e., associate professors, assistant professors, and lecturers) and qualified students, the college seeks to play an active role in the community and servethe national vision of Saudi Arabia (Vision 2030) as we believe that the graduates of the computer science field will play a leading role in many aspects of the vision. Furthermore, the program graduates are expected to acquire the knowledge and skills that enable them to effectively perform in the technical fields of computer science whether in governmental organizations or private sectors.

College Vision

"A nationally distinguished college in computer science, scientific research, and community service".

College Mission

"Providing advanced educational curricula in the fields of computer science, organizing initiatives and camps in entrepreneurship and project development, participating in conferences and forums specialized in the field of computers and technology, establishing scientific academies (Oracle, Cisco) to develop students' skills and supporting them to obtain specialized international certificates Supporting creative research and innovations and working to develop them and bring them to advanced levels consistent with the university's ambitions to achieve the Kingdom's 2030 vision".

Program Vision

"To be a leading program nationally and internationally in the fields of education and scientific research in computer science specialization".

Program Mission

"Preparing and qualifying an outstanding national generation equipped with modern knowledge in computer science by following the scientific methodologies in both the theoretical and practical aspects".

Strategic Goals of College of Computing and Information Technology

		College Goals
	1	Meet the needs of the labor market with highly qualified cadres in the fields of technology and information.
	2	Encouraging faculty members to develop curricula in line with recent developments to keep pace with the labor market
	3	Developing students' projects and research and making them a useful product in achieving the Kingdom's 2030 vision
	4	Closer a relationship of cooperation between the college and other colleges at the university and outside the university in line with the main objectives of Shaqra University
	5	Create an atmosphere of competition and creativity among college students in external posts to present their projects and research, and to represent the college and university in internal and international forums

Strategic Goals of BCS Program

		Program Goals
	1	Graduating competent professionals to meet the growing needs within KSA for a well-qualified workforce specialized in computer science.
	2	Contribute significantly to research and discovery of new knowledge and methods in Computer Science.
	3	Raising awareness towards scientific research and encouraging faculty members and their assistants to conduct applied research in the field of computer science.
	4	Provide students with strong and current conceptual foundations (theory and application) in the area of Computer Science.
	5	Enable students with the necessary tools and skills to effectively in the CS and community needs upon graduation.
	6	Providing advice and technical assistance to the bodies and entities that use computer technology.
	7	Encourage innovative ideas and projects by both department faculty and students.

Organizational Chart of BCS Program

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                          │  Department Council  │
                          └─────────────────────┘
                                    │
                          ┌─────────────────────┐
                          │  Head of Department  │
                          └─────────────────────┘
                                    │
              ┌─────────────────┐       ┌─────────────────────┐
              │  Advisory Board │       │   Female section     │
              │                 │       │    coordinator       │
              └─────────────────┘       └─────────────────────┘
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| Quality Assurance and Accreditation Committee | Academic Advising Committee | Laboratories Committee | Scientific Research Committee | Evaluation and Examination Committee | Courses and Curriculum Development Committee | Student Monitoring Committee |

BCS Program Learning Outcomes (PLOs)

The BCS program has approved and announced the PLOs that support its goals. The attainment of these outcomes prepares graduates to enter the professional practice in the filed of computer science.

The BCS program must demonstrate that graduates should satisfy the following:

Learning Domains	BCS Program Learning Outcomes
1- Knowledge and Understanding The student should be able to:	**K1**. Demonstrate the knowledge of mathematics and natural sciences related to computer science.
	K2. Recognize the fundamental concepts within the body of knowledge in computer science.

2- Skills		
	The student should be able to:	**S2**. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
		S3. Apply computer science theory and software development fundamentals to produce computing-based solutions.
		S4. Communicate effectively in a variety of professional contexts.

| 3- Values | The student should be able to: | **V1**. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles. |
| | | **V2**. Function effectively as a member or leader of a team engaged in activities appropriate to the computer science discipline. |

Admission and Registration Rules

I.	**Student Admissions**
II.	**Transfer Students**
III.	**Transfer Courses**
IV.	**Visiting Student**
V.	**Attendance and Apology for the Study**
VI.	**Withdrawal from University**
VII.	**Graduation Requirements**

I.   Student Admissions

1- Admission of Fresh students

The general requirements for admission to Shaqra University can be listed as
below;

- The new student should be a holder of a secondary school certificate or its equivalent from within the Saudi Arabia or from outside it.
- He should not have obtained a high school or equivalent for more than five years. While, the university council may exempt from this condition if there are convincing reasons.
- He should have a good behavior registry.
- He should successfully pass any personal interview or test that the University Council requires.
- He should be medically fit.
- He should obtain his approval for study if he works in any governmental or private organization.
- He should meet any other conditions determined by the University Council at the time of submission.

According to the admission of freshmen, the University Council determines on the proposal of the College Council the number of students who can be admitted in the next academic year. If there is an excess in the applicant number, the selection is done according to their grades in the general secondary

certificate, personal interview, and admission tests (if found). In addition, the result of the general capabilities test, which is a prerequisite for all applicants, is considered. The ratio of each applicant is calculated as follows: 40% of the general cumulative average for the second year, 30% for the general capabilities test, and 30% for the acquisition test score. It is worth mentioning that the specialization in the College of Computing and Information Technology, Shaqra University requires that the student passes successfully all the courses of the curriculum for the full preparatory year with a rate as mentioned in the following link: https://su.edu.sa/ar/deanships/deanship- admission-and-registration/allocation-criteria-after-passing-preparatory-year

2- Admission of International Students

The admission process for international students is somewhat as same as national ones with all addition of the following:

- To pass the required scores of both capabilities and acquisition tests.
- The equivalent cumulative ratio (40% secondary - 30% capabilities - 30% acquisition) should be a total higher than 85 degrees.
- Not to exceed 25 years of age.
- The student must be a regular resident of Saudi Arabia.

II.   Transfer Students

1- Transfer from Other Universities

The student may, upon the approval of the head of the department and the dean of the college in Shaqra University, accept his transfer from outside the university according to the following rules:
- The student has studied at a recognized college or university.
- The student should not be separated from the University for Disciplinary Reasons.
- The student has spent at least two semesters at the university from which he wishes to transfer, provided that the number of study credit hours recorded in his academic record is not less than (24) hours.
- The student should study at Shaqra University at least 60% of the graduation requirements.
- The student must apply for transfer before the beginning of the semester at least five weeks.

2- Transfer from College to Other within the University

After the approval of the head of the department and the dean of the college in Shaqra University, accept his transfer from according to the following rules:
- The student must have spent at least one semester in the college that he wants to transfer from

with at least (14) credit hours.
- The student should not be interrupted, delayed or apologized for the study from the college from which he wishes to transfer.
- His cumulative average should not be less than the limit determined by the College Council and should not be less than (2 of 5).
- Transfers between university faculties are permitted only twice during the entire period of university study.

3- Transfer from One Specialization to Another within the College

After the approval of the Dean of the College, the student may transfer from one specialization to another within the College according to the following rules:
- Completion of entry requirements for the specialization to be transferred to.
- Not violating the capacity of the department.
- The student has spent at least one semester in the specialization in which he wishes to transfer with 14 credit hours.
- The student should not be interrupted, delayed or apologized for the study from the specialization in which he wishes to transfer.

III.   Transfer Courses

The College Council should compare the courses studied by the student outside the university on the recommendation of the departments that provide these courses. The student's academic record should be confirmed in the student's academic records, and should not be included in the calculation of his cumulative average according to the following rules:

- The student has studied at a recognized college or university.
- The number of hours studied by the student in the course he wants to equal should be equal to or more than the number of hours spent at Shaqra University. This rule may be to consider exceptions by a maximum of one hour.
- The content of the material studied by the student must be identical to the content of the material in the Shaqra University by not less than (70%).

IV.   Visiting Student

Additionally, the transfer courses can be done for the visiting students. The visiting student is defined as the student who is studying some courses in another university or in a branch of the university to which he belongs without transferring him. His credit hours can be calculated according to the following rules;

- The acceptance of the department, the faculty and the grant acceptance and registration to allow the student to study as a visiting student.
- To be studied at a recognized college or university.
- The course topics being taught by the student outside the college are equivalent to the course topics in his college by 70% or more.
- The maximum number of academic credit hours outside the university is 25% of the total number of credit hours required to graduate from Shaqra University.
- The number of credit hours for the course which the student has studied outside the university should be equal to or more than the number of credit hours in Shaqra University.

V.   Attendance and Apology for the Study

1- Attendance Rules

- The regular student must attend lectures and practical lessons. He is prohibited from entering the final exam if his attendance is less than the percentage determined by the university council, but not less than (75%) of the lectures and practical lessons specified for each course during the semester.
- A student who has been prohibited from entering the final exam, is considered to be failing in the course and his final degree will be denied (DN)
- The College Council or its authorized representative may exclude the prohibition and allow the student to enter the test. But the student must present an excuse accepted by the Council. The University Council shall determine the attendance rate, not less than (50%) of the lectures and practical courses specified for the course.
- The student who misses the final test is zero in that test. His final result is calculated from his quarterly work degrees.

2- Apology Rules

- A student may withdraw with the excuse of one or more courses during the semester with the following rules;
- The number of remaining credit hours shall not be less than 12 hours. If he presents an acceptable excuse to the Dean of the College at least three weeks before the start of the final tests.
- A student may apologize for continuing to study a semester without being considered a failing student if he presents an acceptable excuse to the body determined by the university council. His final grade will be (W). The apology semesters must not exceed two consecutive semesters or three non-consecutive semesters.

VI.   Withdrawal from University

The student may withdraw from the university after completion of the procedures of removing the university from the university and return the university card and bring his identity papers to return the original file. The withdrawal from the university shall entail the following:

- The period during which the student withdraws from the university shall be calculated as if he were not studying.

- The rewards of the withdrawn student shall be suspended from the semester until he registers for another semester.
- The student must be evacuated from the residence, the library and other university facilities.
- The student is considered to be withdrawn from the university and he has the right to re-enroll if he required in a period not exceeding four semesters or two academic years.
- The student may apply for postponement of the study for an excuse acceptable to the body determined by the University Council, provided that the postponement does not exceed two consecutive or three semesters.

VII. Graduation Requirements

The Admission and Registration Deanship Office of the University is responsible for ensuring that graduating students have met all graduation requirements which can be classified as below:

1- First Year
The preparatory year aims at enhancing the skills of the student through intense English courses and courses that improve their communication and computer skills. The preparatory year is 32 credit hours.

2- Course Requirements

After successfully passing the preparatory year (32 credit hours) and to complete the graduation requirements for a B.S. in Computer Science, the students are required to successfully pass a total of 162 credit hours

3- Graduation Project Requirements

According to the graduation project requirements, the project is divided into two parts (3 credit hours each). The student is eligible to register for the Graduation Project (1) if student completes successfully at least 130 credit hours including preparatory year. Graduation Project (1) and (2) can be taken during the first and second semesters only (not during summer semester).

4- Field Training Requirements

Prior to graduation, after completion of at least 110 credit hours, each Computer Science major must complete an approved Computer Science Field Training Program. Field training extends over at least 36 credit hours, and must be undertaken in companies or establishments accepted by the college.

BCS Curriculum Structure

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	6	12	7.40%
	Elective	--	--	--
College Requirements	Required	14	42	25.93%
	Elective	--	--	--
Program Requirements	Required	20	60	37.04%
	Elective	3	9	5.56%
Capstone Course/Project	Required	2	6	3.70%
Field Experience/ Internship	Required	1	1	0.62%
Others (Preparatory year)	Required	10	32	19.75%
Total		**56**	**162**	

Shaqra University

BCS Study Plan

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 3	CSC 230	Physics for Computer Science	Required	PHYS 107	3	College
	CSC 202	Basics of Programming and Algorithms	Required	CIT 130	3	College
	CIT 201	Introduction to Database Systems	Required	CIT 130	3	College
	MATH 221	Calculus	Required	MATH 135	3	College
	ARAB 101	Linguistic Skills	Required	-	2	Institution
	ISLM 101	Entry to Islamic Culture	Required	-	2	Institution
Level 4	CIT 202	Computer Networks (1)	Required	CIT 130	3	College
	MATH 210	Principles of Probabilities & Statistics	Required	MATH 135	3	College
	CSC 212	Programming language (1)	Required	CSC 202	3	College
	CIS 221	System Analysis & Design	Required	CIT 201, CSC 202	3	College
	ARAB 103	Arabic Editing	Required	-	2	Institution
	ISLM 102	Islam and Building Society	Required	-	2	Institution
Level 5	CSC 213	Programming language (2)	Required	CSC 212	3	College
	CIS 307	Data Structure	Required	CSC 212	3	College
	MATH 207	Discrete Mathematics	Required	MATH 135	3	College
	CNE 306	Digital logic Design	Required	MATH 135	3	College
	CIT 407	Wireless & Mobile Networks	Required	CIT 202	3	Department
	ISLM 103	Economic System in Islam	Required	-	2	Institution

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 6	CSC 302	Design and Analysis of Algorithms	Required	CIS 307	3	Department
	CSC 304	Web Programming	Required	CSC 213, CIT 202	3	Department
	CSC 306	Biology for Computer Science	Required	-	3	Department
	CNE 401	Computer Architecture and Organization	Required	CNE 306	3	College
	MATH 246	Linear Algebra	Required	MATH 207	3	Department
	ISLM 104	Principles of the Political System in Islam	Required	-	2	Institution
Level 7	CSC 417	Numerical Analysis	Required	MATH 246	3	Department
	CSC 403	Artificial Intelligence	Required	CSC 302	3	Department
	CSC 353	Computer Graphics	Required	CSC 213, MATH 246	3	Department
	CSC 407	Software Engineering	Required	CIS 221	3	Department
	CSC 409	Principles of Bioinformatics	Required	CSC 306	3	Department
	CIT 403	Operating Systems	Required	CNE 401	3	College
Level 8	CSC 418	Machine Learning	Required	CSC 302	3	Department
	CSC 420	Modelling and Simulation	Required	CSC 213, MATH 207	3	Department
	CSC 4XX	Elective course (1)	Elective	Achieving 110+ Credit Hours	3	Department
	CSC 593	Field Training	Required	Achieving 110+ Credit Hours	1	Department
	CIT 303	Advanced Database Systems	Required	CIT 201	3	Department
	CIS 306	Information Security	Required	CIT 202	3	Department

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 9	CSC 501	Cryptography	Required	CIS 306	3	Department
	CSC 503	Theory of Computation	Required	MATH 207	3	Department
	CSC 505	Parallel and Distributed Computing	Required	CSC 302, CSC 213	3	Department
	CSC 5XX	Elective course (2)	Elective	CSC 4XX	3	Department
	CSC 591	Graduation Project (1)	Required	Achieving 130+ Credit Hours	3	Department
Level 10	CSC 502	Natural Language Processing	Required	CSC 418	3	Department
	CSC 506	Compiler Design	Required	CSC 503	3	Department
	CSC 5XX	Elective course (3)	Elective	CSC 5XX	3	Department
	CSC 592	Graduation Project (2)	Required	CSC 591	3	Department
	CIT 506	Computer Ethics	Required	-	3	Department

* Include additional levels if needed
** Add a table for each track (if any)

Shaqra University

Staff Members

The BCS program recruits faculty members with MSc/Ph.D. degrees from highly reputable international universities with experiences in teaching from different countries.

List of BCS program teaching staff

No.	Name	Degree	No.	Name	Degree
1	منيف نايف اوريك العتيبي Munif Alotaibi	Assoc. Prof.	10	أمجد يوسف عبدالله الدويش Amjad Aldwaish	Assist. Prof.
2	سعيد مسعود الشهراني Saeed Alsharany	Assist. Prof.	11	عبد العزيز عبد المنعم عبد الحميد Abdelaziz Abdelhamid	Assist. Prof.
3	رائد شجاع العتيبي Raed Alotaibi	Assoc. Prof.	12	سامية عمر دردوري Samia Dardouri	Assist. Prof.
4	عبد الرحمن عبدالله الغامدي Abdulrahman Alghamdi	Assoc. Prof.	13	نيير احمد خان Nayyar Khan	Lecturer
5	نوف سعيد العتيبي Nouf Alotaibi	Assoc. Prof.	14	عاصف رشيد خان Asef Khan	Lecturer
6	فهد حامد عبدالكريم الشمري Fahad Alshamry	Assoc. Prof.	15	سحر محمد علي الحارثي Sahar Alharthy	Lecturer
7	سيفا رام Sivaram	Assoc. Prof.	16	سهى عبد العزيز محمد السنيدي Soha Alsenidy	Lecturer
8	حسين سعد منير الشهراني Hussain Alsharani	Assist. Prof.	17	انفال فهد مهناء العصيمى Anfal Alosaimi	Lecturer
9	سعد محمد سعد الجبيرين Seed Aljubyrin	Assist. Prof.	18	رند فريد سليمان محافظه Run Mohafdha	Lecturer

BCS Program Laboratories

The laboratories serve the needs of the courses offered by the college departments including computer science tracks.

They are:

1- Lab (9) – Apple lab

2- Lab (10)

3- Lab (11)

4- Lab (12)

Lab (9) – Apple Lab

Lab (10)

Lab (11)

Lab (Female's branch)

Lab (Female's branch)