



جامعة أم القرى
UMM AL-QURA UNIVERSITY



Software Engineering

Program

Guidebook

2023-2024



جامعة أم القرى

قسم هندسة البرمجيات



Collage of Computing

Overview

The UQU College of Computers was established in 1426 A.H. The college includes five academic departments: Computer Engineering and Networking, Computer Science and Artificial Intelligence, Software Engineering, Cybersecurity and Data Science. All these departments grant the bachelor's degree and master's degrees only in Computer Engineering and Networking as well as Computer Science and Artificial Intelligence.

Vision

To establish a hub for learners and scholars to facilitate computing and knowledge technology for community and industry.

Mission

Creation of a conducive environment for quality education and innovative research in computing and informatics promoting knowledge-based economy, societal needs and ethical values.

Software Engineering Program

Mission

Create highly skilled and innovative graduates in software engineering who will serve communities and society with professionalism and ethics.

Objectives

1. Graduates working as software engineers exhibit the necessary technical as well as soft skills.
2. Graduates in software systems development demonstrate strong professional and ethical standards competencies to effectively contribute to the advancement of working organizations and global society at large.
3. Graduate students who pursue graduate degrees also improve their knowledge and abilities through lifelong learning.
4. Graduates take the initiative to help others complete their professional tasks successfully, exhibiting leadership and team management abilities.



Graduates' Attributes

Our SE alumni have four essential characteristics: professionalism, ethics, lifelong learning and research, and leadership. Thus, these are the primary attributes:

1. Deep knowledge and understanding of Software Engineering.
2. Required technical competencies to solve real-world problems using adequate SE methods, tools, and technologies.
3. Effective communication in a variety of professional contexts.
4. High professional and ethical standards competencies in software systems development to efficiently contribute to the progress of the working organizations and worldwide societies at large
5. Leadership and team management skills by taking initiatives facilitating the successful completion of professional duties.
6. High skills and knowledge through life-long learning and pursuit of graduate studies.

Curriculum Structure

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	13	32	17.67%
	Elective	3	6	3.31%
College Requirements	Required	16	49	27%
	Elective			
Program Requirements	Required	22	73	40.33%
	Elective	3	9	5%
Capstone Course/Project	Required	2	4	2.2%
Field Experience/ Internship	Required	2	8	4.41%
Others				
Total			181	100%



Study Plan Details

Level	Course Title	Required Elective /	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 1	Intensive English C1	Required		4	College
	Islamic Culture 1	Required		2	College
	Computational Thinking & Problem Solving	Required		3	College
	Calculus	Required		4	College
	Discrete Structures 1	Required		4	College
Level 2	Intensive English C2	Required	Intensive English C1	4	College
	Holy Quran 1	Required		2	College
	Computer Programming 1	Required	Computational Thinking & Problem Solving	3	College
	General Physics	Required		4	College
	Linear Algebra	Required	Calculus	4	College
Level 3	Intensive English C3	Required	Intensive English C2	4	Institution
	Career Preparation Skills	Required		2	Institution
	Computer Programming 2	Required	Computer Programming 1	3	College



Level	Course Title	Required Elective /	Pre- Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
	Topics in Computing	Required		3	College
	Statistics & probability	Required		4	College
Level 4	Foundations of Software Engineering	Required	Computer Programming 1	3	Department
	Hardware software interface	Required	Computer Programming 1	4	Department
	Software Engineering Ethics	Required		2	Department
	Data Structures	Required	Computer Programming 2	3	Department
	Islamic Culture 2	Required	Islamic Culture 1	2	Institution
	Holy Quraan 2	Required	Holy Quraan 1	2	Institution
Level 5	Requirements Engineering 1	Required	Foundations of Software Engineering	4	Department
	Distributed Programming paradigms	Required	Hardware software interface	4	Department
	Database Fundamentals	Required	Computer Programming 2	3	Department



Level	Course Title	Required Elective /	Pre- Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
	Algorithm Fundamentals	Required	Data Structures	3	Department
	Arabic Writing	Required		2	Institution
	Holy Quraan 3	Required	Holy Quraan 2	2	Institution
Level 6	Software Design & Construction 1	Required	Requirements Engineering 1	5	Department
	Requirements Engineering 2	Required	Requirements Engineering 1	3	Department
	Web Engineering	Required	Computer Programming 2	3	Department
	Project Management	Required	Foundations of Software Engineering	3	Department
	University Elective 1	Elective		2	Institution
	Holy Quraan 4	Required	Holy Quraan 3	2	Institution
Level 7	Software Testing	Required	Software Design & Construction 1	3	Department
	Mobile Apps engineering	Required	Computer Programming 2	3	Department
	Models & Methods	Required	Software Design & Construction 1	3	Department



Level	Course Title	Required Elective /	Pre- Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
	Software Design & Construction 2	Required	Software Design & Construction 1	3	Department
	Functional programming	Required	Calculus	3	Department
	University Elective 2	Elective		2	Institution
Level 8	University Elective 3	Elective		2	Institution
	Research Methods	Required	Software Engineering Ethics	2	Department
	Software Maintenance and Configuration	Required	Software Testing	4	Department
	Introduction to Cybersecurity	Required	Topics in Computing	3	Department
	Scientific Computing	Required	3	Department
	Frameworks and Tools	Required	4	Department
Level 9	Software Quality Attributes	Required	Software Maintenance and Configuration	4	Department
	Specialization Elective 1	Elective		3	Department
	Data Engineering	Required	Database Fundamentals	3	Department



Level	Course Title	Required Elective /	Pre- Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
	Group Project 1	Required	Software Maintenance and Configuration	2	Department
	Operation Research	Required	Scientific Computing	4	Department
	Islamic Culture 3	Required	Islamic Culture2	2	Institution
Level 10	Group Project 2	Required	Group Project 1	2	Department
	Selected Topics in Software Engineering	Required	Software Quality Attributes	3	Department
	DevOps	Required	Software Quality Attributes	3	Department
	Islamic Culture 4	Required	Islamic Culture 3	2	Institution
	Engineer professional Practice	Required	Engineering Ethics	2	Department
	Specialization Elective 2	Elective	Specialization Elective 1	3	Department
	Specialization Elective 3	Elective	Specialization Elective 1	3	Department
Level 11	Cooperative Training	Required	Group Project 2	4	Department
Level 12	Cooperative Training	Required	Group Project 2	4	Department



Elective Courses

#	Course Name	Credit Hours	Pre-Requisite Courses	Type of requirements (Institution, College, or Department)
1	Design Patterns	3	Software Design & Construction 2	Department
2	Internet of Things Application Development	3	Frameworks and Tools	Department
3	Code Generation	3	DevOps	Department
4	Software documentation and redocumentation	3	Software Maintenance and Configuration	Department
5	Game programming	3	Software Design & Construction 2	Department
6	Cloud Computing	3	Foundations of Software Engineering	Department
7	Seminars in Software Engineering	3	Software Quality Attributes	Department
8	Software Crisis	3	Software Maintenance and Configuration	Department
9	Software Quality Standardization	3	Software Quality Attributes	Department

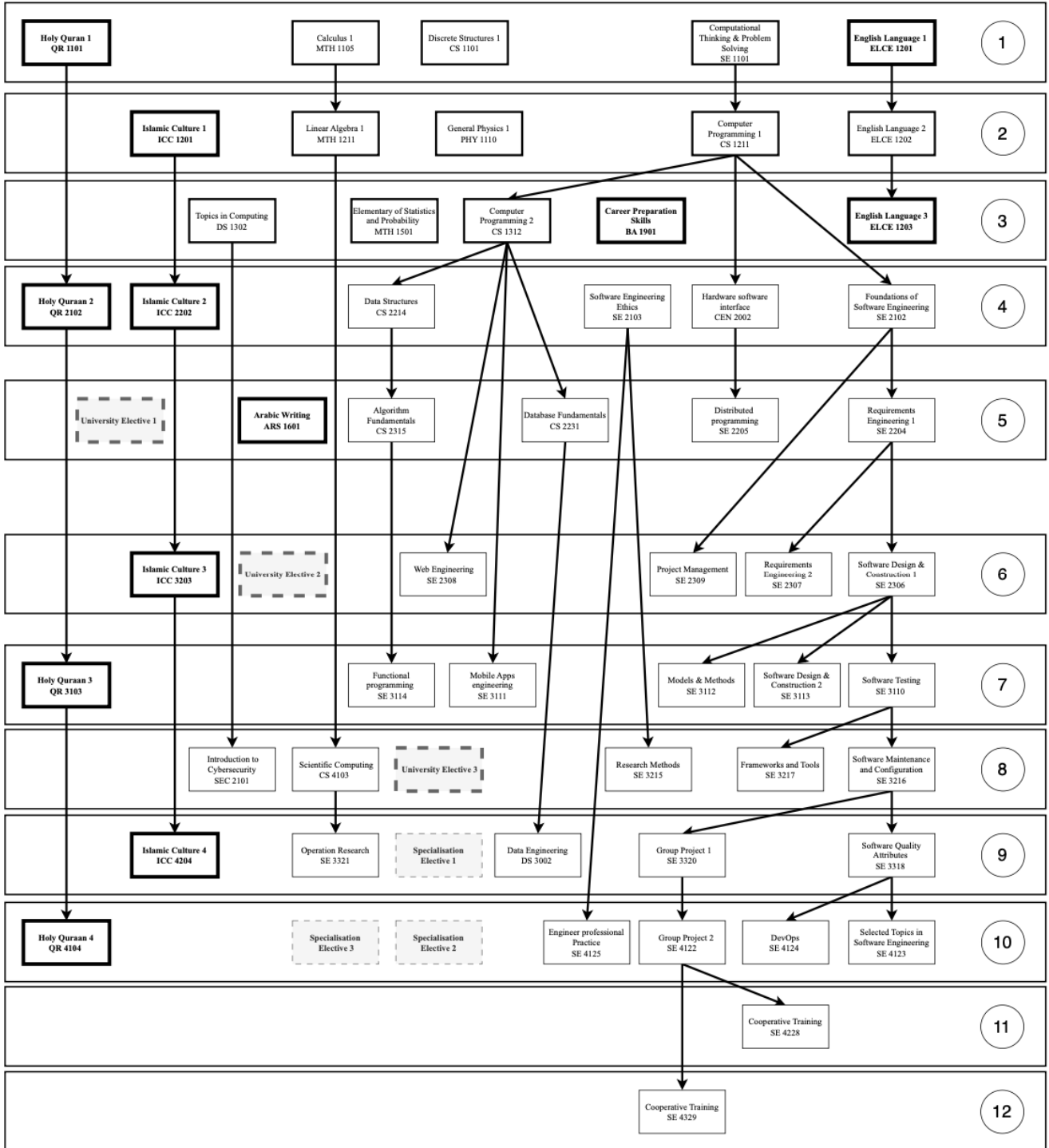


Prerequisites Structure

Software Engineering Program



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Expected Careers

Software engineering plays a prominent role in every part of our daily lives, from electronic devices at home to satellite control in space. The field of software engineering is interested in developing software solutions in scientific and engineering manner, as well as improving practices to develop these solutions from the stage of problem analysis and study of requirements to the stage of designing solutions and ensuring their efficiency, effectiveness and continuous development. It contributes significantly to other fields of computer science such as artificial intelligence and human interaction with technology, as well as organizations across industries. The program graduates have diversity roles to apply for. Here are some of the expected roles amongst other.

Programmer 	Business Analyst 
Quality Assurance Analyst 	Software Tester 
Software/Web Developer 	Project Manager 



Student Guide for Support and Services

University-Level support and Services

List of Services	Information Links
Admission FAQs	https://uqu.edu.sa/dadregis/App/GALLERY/153371?id=215167
The university guide	https://drive.uqu.edu.sa/_/luc/files/.pdf دليل 20% الطالب 20% الجامعي
Ghali Centre for disabled	https://uqu.edu.sa/studaff/App/FAQ/124146
Student Guidance and Counseling Center	https://uqu.edu.sa/studaff/App/FAQ/124167
Department of Student Rights Protection and Disciplinary	https://uqu.edu.sa/studaff/App/FAQ/124286
Student Accommodatio n	https://uqu.edu.sa/studaff/App/FAQ/124293
Student Transportation Department	https://uqu.edu.sa/studaff/App/FAQ/124272
Regulations for study and examinations	https://drive.uqu.edu.sa/_/dadregis/files/44/LDWEJ442C.pdf



List of Services	Information Links
King Abdullah bin Abdulaziz Library	https://uqu.edu.sa/lib
Free Microsoft Office package for students	https://uqu.edu.sa/it/1075
University Medical Centre	https://uqu.edu.sa/umc

Collage-Level Services and Support

Injaz

Injaz aims to present the achievements of the college, exemplified by the graduation projects of its students from diverse departments. The students accentuate their graduation projects through scientific posters, subsequently undergoing evaluation by a specialized committee.

The exhibition is accompanied by the “**Your Project in 3 Minutes (3MP)**” competition, which is adapted from the well-known international competition “3 Minute Thesis (3MT)”. This competition is designed to elevate students' proficiency in delivering clear and concise presentations, motivating them to compete and showcase their ideas in innovative and unconventional ways.

Hackathons

The college has organized and continues to organize numerous competitions and hackathons, such as the **Smart Makkah Hackathon**, which brought together university students and faculty members to devise innovative solutions that serve the city of Makkah.

To facilitate and streamline engagement in competitions and hackathons, the college has set up a specialized committee called the '**Competitions and Internal and External**



Participations Committee.' This committee plays a pivotal role in supporting students throughout their participation journey, ensuring they receive regular updates on upcoming competitions, hackathons, and relevant opportunities. Moreover, the committee serves as a resource for students by providing guidance on preparing for competitions, offering mentorship, and facilitating access to necessary resources. For more information about participation in competitions and hackathons, please refer to the frequently asked questions at: <https://uqu.edu.sa/cis/App/FAQ/156696>.

Collage initiatives

Teach Me: Voluntary Initiative

It is a voluntary initiative among the members of the College of Computer Society to enrich the students' experience.

Gestures and acts of generosity and charity through this initiative are purely for Allah's Sake, without any expected reward or possible gain, with no limitation period.

Etqan Initiative

It is an initiative that aims to provide a training program to prepare students of the University for the requirements of the labor market. The initiative provides a training portfolio with a variety of technical training by continuously providing training programs throughout the week during the academic year. Experts from major technical companies and non-profit governmental and private entities concerned with technology will be sought for cooperation in this endeavor.

Digital Fountains Initiative

The initiative concerns providing a series of virtual scientific lectures, meetings and discussions by a constellation of specialists in the technical and informational fields. This initiative aims to spreading knowledge among the largest number of beneficiaries, introducing the new technologies in the field of computing, taking advantage of the expertise and capabilities from inside and outside the college in serving the community and Contributing to community awareness in a technical and informational manner by organizing specialized seminars and meetings.

'Communities Like You' Initiative

The initiative concerns to provide a safe environment for creatures living among us, such as the cats in our universities, and to spread the culture of kindness to animals which is urged by our religion and human nature.



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