



Degree and Study Plan

College: Science
Department: Computer Science
Cohorts: 2021-2023
Degree: Bachelor of Science¹
Major: Computer Science
Specializations: 1- Intelligent Systems and Data Science
2- Cybersecurity and Computing Infrastructure
3- Web and Software Development



¹ Accredited by the Computing Accreditation Commission of ABET, <http://www.abet.org>

Summary of Credits:	
University Requirements (UR)	6
Foundation Program	NC ⁺
Arabic	2
Oman: State and People	2
Oman and Islamic Civilization or Islamic Culture	2
University Electives (UE)	6
See List A	
College Requirements (CR)	3
See list B	
College Electives (CE)	16
See list C	
Departmental Requirements (DR)	12
See list D	
Departmental Electives (DE)	0
See list E	
Major Requirements (AR)	42
See list F	
Major Electives (AE)	9
See list G	
Specialization Requirements (SR)⁺⁺	22
See list H	
Specialization Electives (SE)⁺⁺	6
See list I	
Minor Requirements (IR)⁺⁺⁺	0
See list J	
Minor Electives (IE)⁺⁺⁺	0
See list K	
TOTAL	122

⁺ Not credited.

⁺⁺ Specialization is optional: If no specialization, the student must take one of the final year project courses (COMP5900, COMP5490, COMP5590, or COMP5690) and the remaining 24 credits can be used for minor and/or major electives.

⁺⁺⁺ Minor is optional: minimum 18 credits to earn a Minor. Courses counting towards an approved Minor may substitute courses listed as Specialization Requirements (List H) or Specialization Electives (List I) but no more than 8 credits counting towards the Major degree (lists C, D, E, F) may count towards a Minor.

For reference contact: **Prof. Khaled Day**

Ext. 2231

HOD: **Prof. Abderezak Touzene**



Date: 03 October 2024

Dea: **Dr. Talal Al-Hosni**




Date: 18.12.2024

Admission and Registration:

Date: _____

Study Plan for Cohorts 2021-2023

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 1 Fall	ARAB1060 or ARAB1019	Arabic Arabic for Non-Arabic Speakers (3 Cr)	2		UR
	COMP2101	Introduction to Computer Science	4	(FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604) and (FPCS0101 or FPCS0102)	CE
	LANC2058	Communication in Science	3	FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604	CR
	MATH2107	Calculus I	4	(FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604) and (FPMT0105 or FPMT0108 or FPMT0109)	CE
	SOCY1005 or SOCY1007*	Oman: State and People Omani Contemporary Society	2		UR
	Total		15		

*For non-Omani citizens only

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 2 Spring	COMP2202	Fundamentals of Object Oriented Programming	3	COMP2101	DR
	ECCE3206	Digital Logic Design	3		AR
	MATH3340	Discrete Mathematics for Computer Science	3	MATH2107 and COMP2101 and LANC2058	AR
	STAT2101	Introduction to Statistics	4	(FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604) and (FPMT0105 or FPMT0108 or FPMT0109)	CE
		University Elective 1	2		UE
	Total		15		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 3 Fall	COMP3203	Introduction to Data Structures & Algorithms	3	COMP2202 and MATH3340 and LANC2058	DR
	COMP3700	Introduction to Web Computing	3	COMP2202 and LANC2058	AR
	COMP3501	Computer Organization & Assembly Language	3	COMP2101 and ECCE3206 and LANC2058	AR
	MATH2201	Linear Algebra with Applications	3	LANC2058	AR
	MATH2108 or MATH2109	Calculus II	3	MATH2107	AR
	Total		15		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 4 Spring	COMP3205	Database Systems	3	COMP3203 and LANC2058	AR
	COMP3502	Computer Networks	3	COMP3203	AR
	COMP3600	Intelligent Systems	3	(COMP3203 or COMP3603) and LANC2058	AR
	COMP3401	Introduction to Software Engineering	4	COMP3203	AR
		Major Elective 1	3		AE
	Total		16		

Study Plan for Cohorts 2021-2023
INTELLIGENT SYSTEMS AND DATA SCIENCE SPECIALIZATION

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 5 Fall	COMP4100	Ethics and Skills for Computing Professionals	2	COMP3401	DR
	COMP4204	Advanced Data Structures and Alg.	3	COMP3203	AR
	COMP4501	Fundamentals of Operating Systems	3	COMP3203 and COMP3501	AR
	COMP4603	Machine Learning	3	(COMP3203 or COMP3603) and (MATH2202 or MATH2201)	SR
	HIST1010 or ISLM1010	Oman & Islamic Civilization or Islamic Culture	2		UR
	STAT2102	Introduction to Probability	3	STAT2101 / (MATH2108 or MATH2109)*	AR
Total			16		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 6 Spring	COMP4509	Introduction to Computer Security	3	COMP3502 and COMP4501	AR
	COMP4605	Computer Vision	3	COMP4603	SR
	COMP4609	Deep Learning Fundamentals	3	COMP4603	SR
		College Elective	4		CE
		University Elective 2	2		UE
	Total		15		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Summer	COMP4445	Summer Training	0	COMP4100	AR
	Total		0		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 7 Fall	COMP5101	Comparative Programming Languages	3	COMP3203 and COMP3501	AR
	COMP5602	Pattern Recognition & Analysis	3	COMP4605	SR
	COMP5605	Mobile Robotics	3	COMP3600	SR
		Specialization Elective 1	3		SE
		Major Elective 2	3		AE
	Total		15		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 8 Spring	COMP5606	Natural Language Processing	3	COMP3600	SR
	COMP5690	Project in Intelligent Systems and Data Science	4	COMP4100 + 3 courses from the Intelligent Systems and Data Science Specialization Requirements	SR
		Specialization Elective 2	3		SE
		Major Elective 3	3		AE
		University Elective 3	2		UE
	Total		15		

Study Plan for Cohorts 2021-2023

CYBERSECURITY AND COMPUTING INFRASTRUCTURE SPECIALIZATION

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 5 Fall	COMP4100	Ethics and Skills for Computing Professionals	2	COMP3401	DR
	COMP4204	Advanced Data Structures and Alg.	3	COMP3203	AR
	COMP4501	Fundamentals of Operating Systems	3	COMP3203 and COMP3501	AR
	COMP4515	Mobile Networks	3	COMP3502	SR
	HIST1010 or ISLM1010	Oman & Islamic Civilization or Islamic Culture	2		UR
	STAT2102	Introduction to Probability	3	STAT2101 / (MATH2108 or MATH2109)*	AR
Total			16		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 6 Spring	COMP4506	Systems and Networks Programming	3	COMP3502 and COMP4501	SR
	COMP4509	Introduction to Computer Security	3	COMP3502, COMP4501	AR
		Major Elective 2	3		AE
		College Elective	4		CE
		University Elective 2	2		UE
	Total		15		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Summer	COMP4445	Summer Training	0	COMP4100	AR
	Total		0		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 7 Fall	COMP5101	Comparative Programming Languages	3	COMP3203 and COMP3501	AR
	COMP5504	Distributed Systems	3	COMP4506	SR
	COMP5507	Cryptography and Network Security	3	COMP3202 and COMP3502	SR
		Specialization Elective 1	3		SE
		Major Elective 3	3		AE
	Total		15		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 8 Spring	COMP5509	Penetration Testing and Ethical Hacking	3	COMP4509	SR
	COMP5511	Computer Forensics	3	COMP4509	SR
	COMP5590	Project in Cybersecurity and Computing Infrastructure	4	COMP4100 + 3 courses from the Cybersecurity and Computing Infrastructure Specialization Requirements	SR
		Specialization Elective 2	3		SE
		University Elective 3	2		UE
	Total		15		

Study Plan for Cohorts 2021-2023

WEB AND SOFTWARE DEVELOPMENT SPECIALIZATION

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 5 Fall	COMP4100	Ethics and Skills for Computing Professionals	2	COMP3401	DR
	COMP4204	Advanced Data Structures and Alg.	3	COMP3203	AR
	COMP4501	Fundamentals of Operating Systems	3	COMP3203 and COMP3501	AR
	COMP4701	Web Application Development	3	COMP3205 and COMP3700	SR
	HIST1010 or ISLM1010	Oman & Islamic Civilization or Islamic Culture	2		UR
	STAT2102	Introduction to Probability	3	STAT2101 / (MATH2108 or MATH2109)*	AR
Total			16		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 6 Spring	COMP4206	Mobile Applications Development	3	COMP3203	SR
	COMP4402	Software Testing	3	COMP3401	SR
	COMP4509	Introduction to Computer Security	3	COMP3502 and COMP4501	AR
		College Elective	4		CE
		University Elective 2	2		UE
Total			15		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Summer	COMP4445	Summer Training	0	COMP4100	AR
	Total		0		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 7 Fall	COMP5101	Comparative Programming Languages	3	COMP3203 and COMP3501	AR
	COMP5402	Requirements Engineering	3	COMP3401	SR
	COMP5701	Web Services	3	COMP3401 and COMP3700	SR
		Specialization Elective 1	3		SE
		Major Elective 2	3		AE
	Total		15		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 8 Spring	COMP5405	Software Patterns	3	COMP3401	SR
	COMP5490	Project in Web and Software Development	4	COMP4100 + 3 courses from the Web and Software Development Specialization Requirements	SR
		Specialization Elective 2	3		SE
		Major Elective 3	3		AE
		University Elective 3	2		UE
	Total		15		

Study Plan for Cohorts 2021-2023
GENERAL COMPUTER SCIENCE - NO SPECIALIZATION

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 5 Fall	COMP4100	Ethics and Skills for Computing Professionals	2	COMP3401	DR
	COMP4204	Advanced Data Structures and Alg.	3	COMP3203	AR
	COMP4501	Fundamentals of Operating Systems	3	COMP3203 and COMP3501	AR
	HIST1010 or ISLM1010	Oman & Islamic Civilization or Islamic Culture	2		UR
	STAT2102	Introduction to Probability	3	STAT2101 and (MATH2108 or MATH2109)*	AR
		Major Elective 2	3		AE
Total			16		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 6 Spring	COMP4509	Introduction to Computer Security	3	COMP3502, COMP4501	AR
		Major Elective 3	3		AE
		Major Elective 4	3		AE
		College Elective	4		CE
		University Elective 2	2		UE
Total			15		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Summer	COMP4445	Summer Training	0	COMP4100	AR
	Total		0		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 7 Fall	COMP5101	Comparative Programming Languages	3	COMP3203 and COMP3501	AR
		Major Elective 5	3		AE
		Major Elective 6	3		AE
		Major Elective 7	3		AE
		Major Elective 8	3		AE
Total			15		

	Course Code	Course Title	Cr.	Pre-Requisite/Co-Requisite*	Cat.
Semester 8 Spring	COMP5900	Project in Computer Science	4	COMP4100	AR
		Major Elective 9	3		AE
		Major Elective 10	3		AE
		Major Elective 11	3		AE
		University Elective 3	2		UE
Total			15		

Department of Computer Science

BSc in Computer Science Degree Plan for Cohorts 2021-2023

DEGREE PLAN: 122 CREDITS

UNIVERSITY REQUIREMENTS (6 CREDITS)

Course code	Cr	Course Title	Prerequisites (Co-Requisite)
ARAB1060 or ARAB1019	2	Arabic Arabic for Non-Arabic Speakers (3 Cr)	
HIST1010 or ISLM1010	2	Oman & Islamic Civilization or Islamic Culture	
SOCY1005 or SOCY1007*	2	Oman: State and People Omani Contemporary Society	

*For non-Omani citizens only

LIST A: UNIVERSITY ELECTIVES (6 CREDITS)

See SQU Deanship of Admission and Registration website for the list of University Electives

Available at: <https://sis.squ.edu.om/sis/webreg/3s/electiveTimeTable.jsp>

LIST B: COLLEGE REQUIREMENTS (3 CREDITS)

Code	Title	Credits	Pre-Requisite / Co-Requisite*
LANC2058	Communication in Science	3	FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604
Total		3	

LIST C: COLLEGE ELECTIVES (16 CREDITS)

Credits taken in excess of 16 can be counted as Major Electives (List G)

Code	Title	Credits	Pre-Requisite / Co-Requisite*
BIOL2101	General Biology 1	4	FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604
CHEM2101	General Chemistry 1	4	(FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604) and (FPMT 0105 or FPMT0109)
COMP2101 [†]	Introduction to Computer Science	4	(FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604) and (FPCS0101 or FPCS0102)
ERSC2101	Introduction to Geology	4	FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604
MATH2107 [†]	Calculus I	4	(FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604) and (FPMT0105 or FPMT0108 or FPMT0109)
PHYS2101	General Physics I	4	(FPEL0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604) and (FPMT 0105 or FPMT0109)
STAT2101 [†]	Introduction to Statistics	4	(FPE0560 or FPEL0600 or FPEL0601 or FPEL0602 or FPEL0603 or FPEL0604) and (FPMT0105 or FPMT0108 or PMT0109)

[†] COMP2101, MATH2107, and STAT2101 are key Pre-Requisite courses for Computer Science Major Requirements.

LIST D: DEPARTMENTAL REQUIREMENTS (12 CREDITS)

Code	Title	Credits	Pre-Requisite / Co-Requisite*
COMP2202	Fundamentals of Object Oriented Programming	3	COMP2101
COMP3203	Introduction to Data Structures and Algorithms	3	COMP2202 and MATH3340 and LANC2058
COMP3401	Introduction to Software Engineering	4	COMP3203
COMP4100	Ethics and Skills for Computing Professionals	2	COMP3401
Total		12	

LIST F: MAJOR REQUIREMENTS (42 CREDITS)

Code	Title	Credits	Pre-Requisite / Co-Requisite*
Computer Science: 30 credits			
COMP3205	Database Systems	3	COMP3203 and LANC2058
COMP3501	Computer Organization & Assembly Language	3	COMP2101 and ECCE3206 and LANC2058
COMP3502	Computer Networks	3	COMP3203
COMP3600	Intelligent Systems	3	(COMP3203 or COMP3603) and LANC2058
COMP3700	Introduction to Web Computing	3	COMP2202 and LANC2058 / COMP3205*
COMP4204	Advanced Data Structures and Algorithms	3	COMP3203
COMP4445	Summer Training	0	COMP4100
COMP4501	Fundamentals of Operating Systems	3	COMP3203 and COMP3501
COMP4509	Introduction to Computer Security	3	COMP3502, COMP4501
COMP5101	Comparative Programming Languages	3	COMP3203 and COMP3501
ECCE3206	Digital Logic Design	3	
Math: 12 credits			
MATH2108 or MATH2109	Calculus II	3	MATH2107
MATH2201	Linear Algebra with Applications	3	LANC2058
MATH3340	Discrete Mathematics for Computer Science	3	MATH2107 and COMP2101 and LANC2058
STAT2102	Introduction to Probability	3	STAT2101 / (MATH2108 or MATH2109)*
Total		42	

LIST G: MAJOR ELECTIVES

(9 CREDITS IF SPECIALIZATION, 33 CREDITS IF NO SPECIALIZATION)

Student must take at least 2 credits from a natural science course that includes laboratory work. Possible choices include BIOL2101, BIOL2102, BIOL2600, CHEM2101, CHEM2102, CHEM3324, ERSC2101, ERSC2102, ERSC2211, ERSC3000, ERSC3016, PHYS2101, PHYS2102, if not used for College Electives (List C).

“All College of Science courses not used for required courses (Lists A, B, C, D, E, F, H and I) can be taken as major electives”.

Refer to the Major Electives Page on the College Website:

<https://www.squ.edu.om/science/Academic-Programs/Undergraduate-Programs/Major-Electives>

LIST H: SPECIALIZATION REQUIREMENTS (22 CREDITS)

Select one of the sub-lists H1, H2 or H3

Credits in excess of 22 (from other specializations) can be counted as Specialization Electives (List I)

LIST H1: INTELLIGENT SYSTEMS AND DATA SCIENCE SPECIALIZATION

Code	Title	Credits	Pre-Requisite / Co-Requisite*
COMP4603	Machine Learning	3	(COMP3203 or COMP3603) and (MATH2202 or MATH2201)
COMP4605	Computer Vision	3	COMP4603
COMP4609	Deep Learning Fundamentals	3	COMP4603
COMP5602	Pattern Recognition and Analysis	3	COMP4605
COMP5605	Mobile Robotics	3	COMP3600
COMP5606	Natural Language Processing	3	COMP3600
COMP5690	Project in Intelligent Systems and Data Science	4	COMP4100 + 3 courses from the Intelligent Systems and Data Science Specialization Requirements
Total		22	

LIST H2: CYBERSECURITY AND COMPUTING INFRASTRUCTURE SPECIALIZATION

Code	Title	Credits	Pre-Requisite / Co-Requisite*
COMP4506	Systems and Networks Programming	3	COMP3502 and COMP4501
COMP4515	Mobile Networks	3	COMP3502
COMP5504	Distributed Systems	3	COMP4506
COMP5507	Cryptography and Network Security	3	COMP3203 and COMP3502
COMP5509	Penetration Testing and Ethical Hacking	3	COMP4509
COMP5511	Computer Forensics	3	COMP4509
COMP5590	Project in Cybersecurity and Computing Infrastructure	4	COMP4100 + 3 courses from the Cybersecurity and Computing Infrastructure Specialization Requirements
Total		22	

LIST H3: WEB AND SOFTWARE DEVELOPMENT SPECIALIZATION

Code	Title	Credits	Pre-Requisite / Co-Requisite*
COMP4206	Mobile Applications Development	3	COMP3203
COMP4402	Software Testing	3	COMP3401
COMP4701	Web Application Development	3	COMP3205 and COMP3700
COMP5402	Requirements Engineering	3	COMP3401
COMP5405	Software Patterns	3	COMP3401
COMP5701	Web Services	3	COMP3401 and COMP3700
COMP5490	Project in Web and Software Development	4	COMP4100 + 3 courses from the Web and Software Development Specialization Requirements
Total		22	

Department of Computer Science – BSc in Computer Science Degree Plan for Cohorts 2021-2023

LIST I: SPECIALIZATION ELECTIVES (6 CREDITS)

Credits taken in excess of 6 can be counted as Major Electives (List G)

Code	Title	Credits	Pre-Requisite / Co-Requisite*
COMP2102	Problem Solving and Programming	3	COMP2101
COMP2105	Introduction to Problem Solving with Visual Basic	3	COMP2101
COMP2206	Introduction to Java	3	COMP2202
COMP2607	Computing in Industry 4.0	3	
COMP3204	Advanced Java Programming	3	COMP2202 and LANC2058
COMP3302	Introduction to Multimedia	3	COMP2202 or COMP3200
COMP3601	Bioinformatics Algorithms	3	BIOL2101, COMP2101
COMP3602	Data Analysis and Visualization with Python	3	COMP2101
COMP3603	Programming Foundation for Machine Learning	3	COMP2101
COMP4202	Database Development	3	COMP3205
COMP4205	Competitive Programming	3	COMP3203
COMP4212	Introduction to Information Retrieval	3	COMP3203
COMP4300	Computer Graphics I	3	COMP3203 and (MATH2202 or MATH2201)
COMP4404	Software Project Management	3	COMP3401
COMP4471	Computational Methods	3	COMP2101 and (MATH2108 or MATH2109) and (MATH2202 or MATH2201)
COMP4507	Internetworking with TCP/IP	3	COMP3502
COMP4604	Digital Image Processing	3	COMP3600
COMP4606	Applied Data Science	3	COMP4603
COMP5204	Computer Science Special Topics (1)	3	Instructor Consent
COMP5400	Software Architecture and Design	3	COMP3401
COMP5508	Interconnection Networks for Multiprocessor and Multicore Systems	3	COMP3502
COMP5521	Finite Automata & Formal Languages	3	COMP3203
COMP5522	Compiler Construction	3	COMP3501 and COMP5521
COMP5557	High Performance Computing	3	COMP3502 and COMP4501
COMP5702	Semantic Web	3	COMP4701
COMP5704	Web Data Mining and Knowledge Discovery	3	COMP4701 and STAT2102
Total		6	

LISTS J & K: MINOR REQUIREMENTS AND ELECTIVES (18 Credits)

MINORS AVAILABLE TO COMPUTER SCIENCE MAJORS

Refer to the minors' page on the College Website to see the available minors and their requirements:

<https://www.squ.edu.om/science/Academic-Programs/Undergraduate-Programs>

- * Students are required to complete 18 Credits in the minor courses to qualify for a minor.
- * Courses counting towards an approved Minor may substitute courses listed as Major Electives (List G) but no more than 8 credits counting towards the Major degree (lists C, D, E, F) may count towards a Minor.
- * Students should take a minor different from their major.

For reference contact: **Prof. Khaled Day**

Ext. **2231**

Approved by Dean of Science: **Dr. Talal Al-Hosni**



Date: 18.12.2024



Office of Admissions & Registration: _____

Confirmed: _____