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الحاسب الآلي
وتقنية المعلومات

جامعة شقراء
Shaqra University

Bachelor of Computer and Network Engineering (BCNE)
Program Handbook – V3

Computer and Network Engineering Department (CNE)

College of Computing and Information Technology (CCIT)

Shaqra University (SU)

Assoc. Prof. Dr. Munif Alotaibi
Dean
College of Computing and Information Technology
Shaqra University
Shaqra 11961, Saudi Arabia
E-mail: munif@su.edu.sa

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 (CCIT) in Shaqra University (SU) 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 CCIT 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.

Assist. Prof. Dr. Saeed Alshahrani
Vice Dean for Educational Affairs
College of Computing and Information Technology
Shaqra University
Shaqra 11961, Saudi Arabia
E-mail: salshahrani@su.edu.sa

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 CCIT offers a bachelor's degree in computer science, computer and network Engineering 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.

Asst. Prof. Dr. Mofadal Mohammad Alymani
Head of Computer and Network Engineering Dept.
College of Computing and Information Technology
Shaqra University,
Shaqra 11961, Saudi Arabia
E-mail: head.cne@su.edu.sa

As Saudi Arabia works toward its Vision 2030 goals, the Computer and Network Engineering Department at Shaqra University is dedicated to training engineers who can support the Kingdom's growing tech needs. We focus on equipping future engineers with skills to build modern network systems, improve internet and communication technologies like 5G, and use AI to create smarter cities, automate industries, and connect everyday devices. By blending classroom learning with hands-on labs, partnerships with tech companies, and research in areas like data protection and cloud systems, we prepare engineers to solve real-world challenges such as keeping critical information safe, expanding reliable internet access, and promoting sustainable development. Aligned with Vision 2030's goals of building a thriving economy and creating new opportunities, we encourage creativity and responsibility, ensuring our engineers not only adapt to global advancements but also design practical solutions for Saudi Arabia's future. Through this effort, we aim to develop skilled engineers and leaders who can turn the Kingdom's vision into lasting progress.

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BCNE Program

The College of Computing and Information Technology (CCIT) has been established in 1434 H (2014 G), 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 and Network Engineering (BCNE) program was established on 11/07/1429H in the College of Engineering at Al-Duwadimi. Next, the department moved on 15/04/1438H to the College of Computing and Information Technology at Shaqra. Then, the students started studying in the BCNE program on 02/01/1441H. Two batches of students have graduated from the program during the academic years (1445 H and 1446 H) 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 of different computer and network engineering as Networks, Cybersecurity and Robotics sectors. The College and the Computer and Network Engineering 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 and network engineering fields. Through the program with a team of highly experienced instructors (i.e., assistant professor, associate professor, professors) and qualified students, the college seeks to play an active role in the community and serve the national vision of Saudi Arabia (Vision 2030) as we believe that the graduates of the computer and network engineering 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 and network engineering whether in governmental organizations or private sectors.

CCIT Vision

“A nationally distinguished college in the fields of computing, scientific research, and community service”.

CCIT Mission

“Preparing distinguished cadres to keep pace with the requirements of the job market through competitive programs in the fields of computing through an environment that encourages scientific research and community service”.

BCNE Program Vision

“To be a distinguished program in computer and network engineering, delivering high-quality education, impactful research, and effective community service.”.

BCNE Program Mission

“Preparing distinguished engineers in computer and network engineering who are capable of meeting the evolving needs of industry and addressing technological challenges, supported by qualified professionals, a high-quality learning environment, advanced scientific research, and effective community partnerships.”.

CCIT Strategic Goals

	CCIT Goals
1	Develop the college's organizational structure and academic programs.
2	Raise the efficiency of the college's academic and administrative human resources.
3	Achieve competitive educational outcomes for academic programs in keeping with job market changes.
4	Provide scientific research in the fields of computing in line with development and societal priorities.
5	Strengthen partnership with the community and effectively contributing to its development and service in the fields of computing.
6	Provide an enticing educational environment and improve teaching and learning methods.

BCNE Program Strategic Goals

	BCNE Program Goals
1	Enhance the efficiency and effectiveness of the organizational and administrative environment within the program.
2	Support the professional growth of the program's faculty and staff through targeted training and cutting-edge skill development.
3	Qualify specialized engineers in computer and networks engineering capable of continuous learning to meet the demands of the labor market.
4	Promote scientific research and innovation in computing and network technologies.
5	Offer technical consultations and services to the community, public, and private sectors.
6	Provide a safe and stimulating educational environment.

BCNE Program Learning Outcomes (PLOs)

The BCNE program has an approved and announced set of program learning outcomes (PLOs) that support its goals. The attainment of these outcomes prepares graduates to enter the professional practice in the field of computer and network engineering.

Learning Domains	BCNE Program Learning Outcomes (PLOs)	
Knowledge & Understanding	**K1**	Demonstrate the knowledge of mathematics and basic sciences related to the computer and network engineering discipline.
	K2	Recognize the fundamental principles of the computer and network engineering discipline.
Skills	**S1**	Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
	S2	Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
	S3	Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
	S4	Communicate effectively with a range of audiences.
Values	**V1**	Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
	V2	Function effectively on a team whose members together provide leadership, create a

		collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
	V3	Acquire and apply new knowledge as needed, using appropriate learning strategies.

Admission and Registration Rules

1. Student Admissions

1a. 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 withinthe Saudi Arabia or from outside it.
- He/She should not have obtained a high school or equivalent for more than five years. While, theuniversity council may exempt from this condition if there are convincing reasons.
- He/She should have a good behavior registry.
- He/She should successfully pass any personal interview or test that the University Councilrequires.
- He/She should be medically fit.
- He/She should obtain his approval for study if he works in any governmental or private organization.
- He/she should meet any other conditions determined by the University Council at the time of admission.

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 anexcess 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 (CCIT), 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

1b. Admission of International Students

The admission process for international students is somewhat as same as national ones with alladdition 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 bea total higher than 85 degrees.
- Not to exceed 25 years of age.
- The student must be a regular resident of Saudi Arabia.

2. Transfer of Students

2a. Transfer from Other Universities

The student may, upon the approval of the head of the department and the dean of the collegein 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.

2b. 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.

2c. 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 toanother 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 totransfer with 14 credit hours.
- The student should not be interrupted, delayed or apologized for the study from thespecialization in which he wishes to transfer.

3. Transfer of Courses

The College Council should compare the courses studied by the student outside the university onthe 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 calculationof 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 equalto or more than the number of hours spent at Shaqra University. This rule may be to considerexceptions 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%).

4. Visiting Students

Additionally, the transfer courses can be done for the visiting students. The visiting student isdefined 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 calculatedaccording to the following rules:

- The acceptance of the department, the faculty and the grant acceptance and registration toallow 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 coursetopics in his college by 70% or more.
- The maximum number of academic credit hours outside the university is 25% of the totalnumber of credit hours required to graduate from Shaqra University.
- The number of credit hours for the course which the student has studied outside theuniversity should be equal to or more than the number of credit hours in Shaqra University.

5. Attendance and Apology from Study

5a. 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 thesemester.
- 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 thestudent 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.

5b. Apology Rules

- A student may withdraw with the excuse of one or more courses during the semester with thefollowing 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 failingstudent 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 semestersor three non-consecutive semesters.

6. Withdrawal from University

The student may withdraw from the university after completion of the procedures of removingthe 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 ifhe 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 twoconsecutive or three semesters.

7. Graduation Requirements

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

7a. Preparatory Year

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

7b. Course Requirements

After successfully passing the preparatory year (32 credit hours) and to complete the graduation requirements for a B.S. in Computer and Network Engineering, the students are required to successfully pass a total of 163 credit hours.

7c. 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 the 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).

7d. Field Training Requirements

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

BCNE Program Curriculum Structure

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	6	12	9%
	Elective	0	0	0%
College Requirements	Required	14	42	32%
	Elective	0	0	0%
Program Requirements	Required	24	61	46%
	Elective	3	9	7%
Capstone Course/Project	Required	2	6	5%
Field Training/ Internship	Required	1	1	1%
Residency year	-	0	0	0%
Others	-	0	0	0%
Total		50	131	100%

BCNE Program Study Plan

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution,
Level 3	CSC 230	Physics for Computer Science	Required	PHYS 107	3	College
	CIT 201	Introduction to Database Systems	Required	CIT 130	3	College
	MATH 221	Calculus	Required	MATH 135	3	College
	CSC 202	Basics of Programming and Algorithms	Required	CIT 130	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	3	CIT 130	College
	MATH 210	Principles of Probabilities & Statistics	Required	3	MATH 135	College
	CSC 212	Programming language (1)	Required	3	CSC 202	College
	CIS 221	System Analysis & Design	Required	3	CIT 201, CSC 202	College
	ARAB 103	Arabic Editing	Required	2	-	Institution
	ISLM 102	Islam and Building Society	Required	2	-	Institution
	GE 106	Introduction to Engineering	Required	2	-	Program

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution,
Level 5	PHYS 150	General Physics	Required	4	-	Program
	CHEM 101	General Chemistry (1)	Required	4	-	Program
	MATH 250	Advanced Calculus	Required	3	MATH 221	Program
	CSC 213	Programming language (2)	Required	3	CSC 212	College
	ISLM 103	Economic System in Islam	Required	2	-	Institution
Level 6	MATH 251	Differential Equations	Required	3	MATH 250	Program
	CNE 302	Electric Circuits	Required	3	MATH 250 PHYS 150	Program
	CNE 304	Electric Circuits Lab	Required	1	CNE 302	Program
	CNE 306	Digital logic Design	Required	3	MATH 135	College
	CNE 308	Digital Logic Lab	Required	1	CNE 306	Program
	CNE 310	Computer Aided Engineering Drawing	Required	3	CIT 130	Program
	MATH 207	Discrete Mathematics	Required	3	MATH 135	College
Level 7	MATH 246	Linear Algebra	Required	MATH 207	3	Program
	CNE 401	Computer Architecture and Organization	Required	CNE 306	3	College

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution,
	CNE 403	Computer Networks (2)	Required	CIT 202	3	Program
	CNE 405	Computer Networks Lab	Required	CNE 403	1	Program
	CNE 407	Electronics	Required	CNE 302	3	Program
	CNE 409	Electronics Lab	Required	CNE 407	1	Program
	ISLM 104	Principles of the Political System in Islam	Required	-	2	Institution
Level 8	MATH 450	Numeric Methods	Required	MATH 250	3	Program
	CNE 402	Signals and Systems	Required	MATH 251	3	Program
	CNE 404	Embedded Systems	Required	CNE 401	3	Program
	CNE 406	Embedded Systems Lab	Required	CNE 404	1	Program
	CIS 307	Data Structure	Required	CSC 212	3	College
	CIT 403	Operating Systems	Required	CNE 401	3	College
	CNE 593	Field Training	Required	Achieving 110+ Credit Hours	1	Program
Level 9	CNE 501	Digital Signal Processing	Required	3	CNE 402	Program
	CNE 503	Network Security	Required	3	CNE 403	Program
	CNE 504	Introduction to Robotics	Required	3	MATH 246	Program
	CNE 5--	Elective (1)	Elective	3	X	Program
	CNE 591	Graduation Project (1)	Required	3	معتمدة او أكثر	Program

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution,
					Achieving 130+ Credit Hours	
Level 10	GE 403	Engineering Economy	Required	2	-	Program
	GE 490	Ethics and Professional Practice	Required	2	-	Program
	CNE 502	Digital Control Systems	Required	3	CNE 501	Program
	CNE 5--	Elective (2)	Required	3	X	Program
	CNE 5--	Elective (3)	Required	3	X	Program
	E 592	Graduation Project (2)	Required	3	CNE 591	Program

Elective Courses:

Group	Course Code	Course Title	Pre-Requisite Courses	Credit Hours
Computer Systems and Robotics	CNE 505	Digital System Design	CNE 404	3
	CNE 506	Advanced Computer Architecture	CNE 401 CNE 505	3
	CNE 508	Advanced Robotics	CNE 504 CNE 505	3
	CNE 510	VLSI Design	CNE 407 CNE 505	3
Computer Networks	CNE 507	Routing and switching	CNE 403	3
	CNE 512	Mobile Computing	CNE 507	3
	CNE 514	Internet Engineering and Technologies	CNE 507	3
	CNE 516	Blockchain Engineering	CNE 507	3
CyberSecurity	CNE 509	CyberSecurity Principles	CNE 403	3
	CNE 518	Public Key Infrastructure	CNE 509	3
	CNE 520	Web and eCommerce Security	CNE 509	3
	CNE 522	Internet-of-Things (IOT) Security	CNE 509	3

BCNE Course Description

1. Level 3

Subject Code	CIT 1301
Course Title	Physics for Computer Science
Credit hours	3 (2,0,2)
Level	3
Pre-Requisite	PHYS 107 - Introduction to Physics-1
Co-Requisite	None
Catalogue Description	This course teaches the students practical skills needed for solving the modern physics problems by means of computation. Topics included, Introduction: Computation and Science Software Basics and Errors/Uncertainties, Basic Numerical Tools-Python, Matrix Computation, Numerical Integration and Differentiation, Interpolation, Extrapolation, Searching and Fitting, Classical physical systems to quantum systems, Introduction to parallel computing and visualization techniques.

Subject Code	CSC 202
Course Title	Basics of Programming and Algorithms
Credit hours	3 (2,0,2)
Level	3
Pre-Requisite	CIT 130 - Computer Skills
Co-Requisite	None
Catalogue Description	This course helps the students understand how to develop algorithmic solutions for simple problems and represent them formally. It also introduces the students to high-level languages programming (using Python). Topics included, Introduction to programming and algorithms Algorithms, flowcharts and pseudocode, Variables and datatypes, Structural programing (sequence, selection, and repetition), Python: variables, expressions and statements, Python: conditionals, Python: repetitions, Python: data structures (strings, lists, dictionaries, … etc.), Python: functions, Python: modules, Python: searching and sorting algorithms.

Subject Code	CIT 201
Course Title	Introduction to Database Systems
Credit hours	3 (2,2,0)
Level	3
Pre-Requisite	None
Co-Requisite	None
Catalogue Description	This course covers a wide array of topics such as characteristics and advantages of the database management systems (DBMS), concepts of database and its architecture. Topics included, Introduction and Overview, Centralized and client/server Architecture for DBMS, The Relational Data Model and Relational Database Constraints, Introduction to Structured Query Language (SQL), Formal Relational Query Language (Relational Algebra & Relational Calculus), Conceptual Modeling and Database Design, SQL: Intersect expressions, Union and except expressions, Serious quantification lacking, Disk Storage, Basic File Structures Normalization, group discussion

Subject Code	MATH 221
Course Title	Calculus
Credit hours	3(2,2,0)
Level	3
Pre-Requisite	MATH 135 – Math-2
Co-Requisite	None
Catalogue Description	This course introduces the basic concepts of mathematical analysis used in science and engineering. Topics included, Introduction: Basic Concepts of mathematical Analysis, Solving, Equations using derivatives and limits, Differential Calculus, Derivatives, Differentiation Rules, Integral Calculus, Partial Fraction and Newton's Method

2. Level 4

Subject Code	CIT 202
Course Title	Computer Networks (1)
Credit hours	3 (2,0,2)
Level	4
Pre-Requisite	CIT 130 – Computer Skills
Co-Requisite	None
Catalogue Description	This course presents an overview of computer networks (types, layered standard models, and protocols). Topics included, Overview of data communications and networking (Introduction / Overview of data communications / Network models), Physical layer of the internet model TCP/IP (Signals/Digital Transmission/Analog Transmission / Transmission media), Data link layer of the internet model TCP/IP (Framing /Data link control protocols / Multiple access control protocols / Wired LANs : Ethernet) , Network layer of the internet model TCP/IP (Logical addressing / IP Protocol / Address Mapping Protocols / Forwarding and Routing, Transport Layer of the Internet model TCP/IP (client/server model , transport protocols (TCP & UDP services, operations , and applications)), Application Layer of the Internet model TCP/IP (Application layer services , Domain Name System (DNS) , Hypertext Transfer Protocol (HTTP))

Subject Code	MATH 210
Course Title	Principles of Probabilities & Statistics
Credit hours	3 (2,2,0)
Level	4
Pre-Requisite	
Co-Requisite	None
Catalogue Description	This course gives an introduction to the statistics, data, population, meaning of quantitative variables, levels of measures and sampling methods. Topics included, Introduction to Probability and Random events, calculating probability using Venn diagram, Probability rules, Baye's Theorem, Mean and Standard Deviation of a Discrete Random Variable, Application to the Random Variables., Mean and Standard Deviation of a Continuous Random Variable, Application to the Continues Random Variables, The mean and The Standard deviation of a Binomial Distribution, The Standard Normal Distribution, Concepts of simple linear correlation and linear regression.

Subject Code	CSC 212
Course Title	Programming language (1)
Credit hours	3 (2,0,2)
Level	4
Pre-Requisite	CSC 202 - Basics of Programming and Algorithms
Co-Requisite	None
Catalogue Description	This course is an introduction to programming, emphasizing understanding and implementation of applications using object-oriented techniques. Topics included, Introduction to Python, Lists & Tuples, Dictionaries & sets, Strings, Functions, Lambdas functions, Higher order functions, Object oriented programming.

Subject Code	CIS 221
Course Title	System Analysis & Design
Credit hours	3(2,0,2)
Level	4
Pre-Requisite	CSC 202 - Basics of Programming & Algorithms CIT 201 - Introduction to Database Systems
Co-Requisite	None
Catalogue Description	System analysis and design courses deal with planning the development of information systems through understanding and specifying in detail what a system should do and how the components of the system should be implemented and work together. Topics included, Introduction to the Systems Development Life Cycle (SDLC), Project Managements and Scheduling, Requirements Determination, Functional Modelling and Use Cases, Design and implementation, Data Modeling, System Design, Class and Method Design, Database Design, User Interface Design, Architecture Design.

3. Level 5

Subject Code	GE 106
Course Title	Introduction to Engineering
Credit hours	3 (1,0,2)
Level	5
Pre-Requisite	None
Co-Requisite	None
Catalogue Description	Introducing the concept and discipline behind Engineering as a science. Introduction to engineering course is pointing to the career requirements and how the process goes on. Explaining the role of the engineer in civilization. Debating Engineering as a Job. Orientating the engineering education scheme. Discussing the Engineer profession, education and career planning. Offering most of the success skills as time management, training procedures, teamwork, solve problems and study groups. Approaching the main idea behind being apart of any project to solve problems. Introducing some of the Engineering software tools.

Subject Code	PHYS 150
Course Title	General Physics
Credit hours	4 (3,1,2)
Level	5
Pre-Requisite	None
Co-Requisite	None
Catalogue Description	This course courses deal with Electricity and Magnetism: Coulomb's law, electric fields, Gauss' Law, The Biot–Savart Law, electric potential, capacitance and dielectric, magnetic fields, motion of charged particle in a magnetic field, sources of the magnetic field, Ampere's law, Faraday's law of induction, Linz law, self-inductance, energy in a magnetic field, mutual inductance, alternating current circuits, the RLC series circuit, power in an A.C. circuit, Resonance in RLC circuits.

Subject Code	CHEM 101
Course Title	General Chemistry 1
Credit hours	4 (3,1,2)
Level	5
Pre-Requisite	None
Co-Requisite	None
Catalogue Description	This course is designed as an introductory course of chemistry for computer and network engineering students to cover the main principles of chemistry, including the fundamental. By the end of the course, students are expected to Recognize the laws of gases and their applications, Recognize the properties of liquids and the different methods for their studies, Recognize the structure of atom and studying the related various theories, Recognize the chemical bonds and their characteristics, Recognize the chemical elements and their properties through studying the periodic table.

Subject Code	MATH 250
Course Title	Advanced Calculus
Credit hours	3 (3, 1, 0)
Level	5
Pre-Requisite	MATH 221-Calculus
Co-Requisite	None
Catalogue Description	This course covers the foundations of the Infinite series, convergence and divergence of infinite series, integral test, ratio test, root test and comparison test. Conditional convergence and absolute convergence, alternating series test. Power series, Taylor and Maclaurin series. Double integral and its applications to area, volume, moments and center of mass. Double integrals in polar coordinates. Triple integral in rectangular, cylindrical and spherical coordinates and applications to volume moment and center of mass. Vector fields, line integrals, surface integrals, Green's theorem, the divergence theorem, Stoke' theorem.

Subject Code	CSC 213
Course Title	Programming Language 2
Credit hours	3 (2, 0, 2)
Level	5
Pre-Requisite	CSC 212-Programming Language 1
Co-Requisite	None
Catalogue Description	This course focuses on advanced programming concepts and skills. The main topics focus on advanced Python modules such as Regular expressions, Exception handling, File Handling, Multithreading, Database handling, GUI, NumPy and Data Visualization, Exception Handling. By the end of the course, students are expected to Recognize the File Handling, Database manipulation, Data visualization and Graphical user interface design.

4. Level 6

Subject Code	MATH 251
Course Title	Differential Equations
Credit hours	3(3,1,0)
Level	6
Pre-Requisite	MATH 250-Advanced Calculus
Co-Requisite	None
Catalogue Description	This course is continuing to provide students with the ability to understand Various types of first order equations and their applications. Linear equations of higher order. Systems of linear equations with constant coefficients, reduction of order. Power series methods for solving second order equations with polynomial coefficients. Fourier series, Fourier series for even and odd functions. Complex Fourier series. The Fourier integral.

Subject Code	CNE 302
Course Title	Electric Circuits
Credit hours	3(3,1,0)
Level	6
Pre-Requisite	MATH 250 - Advanced Calculus PHY 150 - General Physics
Co-Requisite	None
Catalogue Description	This course provides an introduction and concepts of electric circuits analysis. Topics covered in this course include: circuit elements, electric quantities, mesh and nodal analysis methods, RL and RC circuits, AC circuit analysis in time and phasor domains.

Subject Code	CNE 304
Course Title	Electric Circuits Lab
Credit hours	1(0, 0, 2)
Level	6
Pre-Requisite	None
Co-Requisite	CNE 302 - Electric Circuits
Catalogue Description	This course focuses on the practical aspects of electric circuits analysis. It includes experiments using both simulation and practical implementations of simple electric circuits built from basic electric elements such resistors, inductors, and capacitors. This course also allow undergraduate computer and network engineering students to develop and test electrical circuits practically and conduct basic electric circuits experiments.

Subject Code	CNE 306
Course Title	Digital Logic Design
Credit hours	3 (31,0)
Level	6
Pre-Requisite	MATH 135 – Math 2
Co-Requisite	None
Catalogue Description	This course covers the foundations of the digital logic design process. Topics covered include number systems, Boolean algebra, logic gates, logic simplification, combinational logic circuits: adders, comparators, decoders, multiplexers, … etc., sequential logic circuits: latches, flip-flops, registers, counters, memory, … etc.

Subject Code	CNE 308
Course Title	Digital Logic Lab
Credit hours	1(0,0,2)
Level	6
Pre-Requisite	CNE 306 - Digital Logic Design
Co-Requisite	None
Catalogue Description	This course introduces the Familiarization with logic circuits laboratory. Introduction to logic gates. Implementation of Boolean functions using AND and OR gates. NAND and NOR implementation. XOR and adders. Design of combinational circuits. Flip-flops. Design of sequential circuits. Sequential PLA's.

Subject Code	CNE 310
Course Title	Computer Aided Engineering Drawing
Credit hours	3(2,0,2)
Level	6
Pre-Requisite	CIT 130 - Computer Skills
Co-Requisite	None
Catalogue Description	This course introduces the basics and fundamentals of computer aided drawing and graphics for computer engineering including modeling and design, 2D models representation and electronic diagrams. By the end of the course, students are expected to Recognize the fundamentals of drafting in a computer lab using AutoCAD drafting software, Recognize the 3-D visualization using computer wire frame and surface modeling techniques, 3- Recognize the modeling and design of electronic circuit diagrams

Subject Code	MATH 207
Course Title	Discrete Mathematics
Credit hours	3(2,2,0)
Level	6
Pre-Requisite	MATH 135-Mathematics 2
Co-Requisite	None
Catalogue Description	Fundamentals of Mathematical Logic: Sets and Subsets, Operations on Sets, Prepositional Logic: Matrix and Determinant, Counting: Basics and Binomial theorem, Number theory: Introduction to Linear Equations, Recursion and Recurrences, Linear Programming, Graphs and Trees: Graph Traversal, Tree Traversal, Sorting.

5. Level 7

Subject Code	MATH 246
Course Title	Linear Algebra
Credit hours	3 (3, 1, 0)
Level	7
Pre-Requisite	Math 207-Discrete Mathematics
Co-Requisite	None
Catalogue Description	This course introduces Matrices and their operations., types of matrices. Elementary transformations. Determinants, elementary properties. Inverse of a matrix. Linear systems of equations. Vector spaces, linear independence, finite dimensional spaces, linear subspaces. Inner product spaces. Linear transformations, kernel and image of a liner transformation. Eigen values and Eigen vectors of a matrix and of a linear operator.

Subject Code	CNE 401
Course Title	Computer Organization and Architecture
Credit hours	3 (2, 0, 2)
Level	7
Pre-Requisite	CNE 306-Digital Logic Design
Co-Requisite	None
Catalogue Description	This course covers the following topics: computer architecture vs. organization, computer function vs. structure, computer performance, machine program execution, interrupts, memory (internal, external, cache), input/output devices, instruction sets, pipelining, parallel processing, and multicore.

Subject Code	CNE 403
Course Title	Computer Networks 2
Credit hours	3(2,0,2)
Level	7
Pre-Requisite	CIT 202 Computer Networks 1
Co-Requisite	None
Catalogue Description	This course covers the following topics: Overview of computer networks. Principles of internetworking. Internetworking hardware. Bridging and switching technologies. Virtual LANs. Routing strategies. The network development life cycle. Network analysis and design methodology. Enterprise network design model. Backbone design concepts. Network security design. Structured cabling systems. Network design algorithms. Traffic flow analysis. Network reliability. Network management (SNMP). Network administration.

Subject Code	CNE 405
Course Title	Computer Networks Lab
Credit hours	1(0, 0, 2)
Level	7
Pre-Requisite	CIT 202-Computer Networks 1
Co-Requisite	None
Catalogue Description	Peer-to-peer and Server-based networks; LAN components and their Interaction; Common Transport Protocols; router configuration; bridged networks; performance analysis of LANs; virtual networks; network security; and Wireless networks.

Subject Code	CNE 407
Course Title	Electronics
Credit hours	3(3,0,1)
Level	7
Pre-Requisite	CNE 302-Electric Circuits
Co-Requisite	None
Catalogue Description	This course is designed to cover the principles and concepts of electronic devices in digital and computer systems. This course helps the students understand the basics of electronic elements and learn the basic concepts of electronics. It also teaches them the concept of semiconductor devices and teaches them about different types of transistors and their characteristics.

Subject Code	CNE 409
Course Title	Electronics Lab
Credit hours	1 (0,0,2)
Level	7
Pre-Requisite	CNE 304 Electric Circuits Lab
Co-Requisite	CNE 407 Electronics
Catalogue Description	This Course is designed to cover the practical aspects of electronic devices. Main objective of this course is to distinguish the basic principle of operation of the dual trace oscilloscope. Apply the oscilloscope to measure: the frequency and amplitude of a signal, the phase-shift between signals, Familiarize the students with Diode Characteristics, demonstrate construction, principle of operation, limitations, waveform error, and applications of a half- wave and full-wave rectifier, Studying the Bipolar Junction Transistor (BJT) input/output Characteristics, Studying the Field Effect Transistor (FET) input/output Characteristics

6. Level 8

Subject Code	MATH 450
Course Title	Numeric Methods
Credit hours	3 (3, 1, 0)
Level	8
Pre-Requisite	MATH 250 Advanced Calculus
Co-Requisite	None
Catalogue Description	This course is designed to make the student learn and understand various types of Numerical Methods that are used to solve Common engineering problems. These methods are used quite often for managing the problems and deriving results. The main objectives for the course are: Learn Numerical Methods for Algebraic Problem Solving, Calculus based problems and statistical problem solutions.

Subject Code	CNE 402
Course Title	Signals and Systems
Credit hours	3 (2,0,2)
Level	8
Pre-Requisite	MATH 251- Differential Equations
Co-Requisite	None
Catalogue Description	This course covers the topics of various signals and systems, including basic transformations and different signal representation methods. This course Use of MATLAB software for simulation of signals and systems, Signal classification, sketching and basic time-domain operations, describe a system by its impulse/step response, differential/difference equation, and block diagram, Apply the basic definitions of the Fourier transform, Laplace transform and Z-transform

Subject Code	CNE 404
Course Title	Embedded Systems
Credit hours	3 (3, 1, 0)
Level	8
Pre-Requisite	CNE 401-Computer Architecture and Organization
Co-Requisite	None
Catalogue Description	This course Introduces embedded system design concepts. Investigating the architecture of one of the microcontroller families and its instruction set. Programming embedded systems with assembly and/or high-level languages. Configuring different processor modules, such as: reset, oscillator interrupts, timers, Analog/Digital, serial communications.

Subject Code	CNE 406
Course Title	Embedded Systems Lab
Credit hours	1 (0, 0, 2)
Level	8
Pre-Requisite	None
Co-Requisite	CNE 404 Embedded Systems
Catalogue Description	This course gives an introduction to embedded systems design tools and hardware programmers. It includes experiments using both simulation and practical implementation of embedded systems considering a variety of sensors and actuators such as: switches, LEDs, LDRs, ultrasonic, motors, … etc. It also contains a design project.

Subject Code	CIS 307
Course Title	Dats Structures
Credit hours	3 (2,0,2)
Level	8
Pre-Requisite	CSC 212 Programming 1
Co-Requisite	None
Catalogue Description	The main objective of this course is to provide students with the basics of data structures. It covers a wide area of topic such as Array, Linked lists, Stacks, Queues, Recursion, Graph and Tree structures. This course also aims to provide students with an understanding of the basic searching and sorting algorithms, including, binary search and bubble sort, selection sort, and merge sort. The students will also provide with a conceptual understanding of the trade-offs among different abstract of data structures, hence enabling students to choose an optimal and appreciated data structure for a particular application.

Subject Code	CIT 403
Course Title	Operating Systems
Credit hours	3 (2,0,2)
Level	8
Pre-Requisite	CSC 213 Programming language (2)
Co-Requisite	None
Catalogue Description	The main objective of this course is to provide students with the basics of Computer-system organization and structures- Different operating systems OSs (Mainframe, Desktop, Multiprocessor, Distributed, Clustered, Real-Time, Handheld), Computer-System Structures (I/O, Storage, Storage Hierarchy, Hardware Protection, Network)- Process scheduling and multi-threading – CPU scheduling – Memory management units (MMUs).

Subject Code	CNE 593
Course Title	Field Training
Credit hours	1 (0,2,0)
Level	8
Pre-Requisite	Achieving at least 110 credit hours
Co-Requisite	None
Catalogue Description	This field training course is designed to provide students with practical, real-world experience in the field of computer engineering. The program bridges the gap between academic learning and professional application by placing students in industry settings where they can apply their knowledge in areas such as hardware design, embedded systems, software development, networking, cybersecurity, and systems integration. During the training period, students will work under the supervision of experienced professionals, engage in team-based projects, and gain exposure to current technologies, tools, and industry practices. The training enhances technical and soft skills such as problem-solving, communication, project management, and professional ethics, helping students prepare for future careers in the tech industry.

7. Level 9

Subject Code	CNE 501
Course Title	Digital Signal Processing
Credit hours	3 (2,0,2)
Level	9
Pre-Requisite	CNE 402 Signals and Systems
Co-Requisite	None
Catalogue Description	This course provides an introduction to the History and overview; sampling theorem, aliasing; sampled signals, periodic signals, non-periodic signals; impulse response and convolution; digital spectra analysis; discrete Fourier transform, fast Fourier transform; z-transform; digital filters, FIR and IIR filter design; windowing; effect of finite word length in digital signal processors; application in audio and image processing

Subject Code	CNE 503
Course Title	Network Security
Credit hours	3 (2,0,2)
Level	9
Pre-Requisite	CNE 403 - Computer Networks (2)
Co-Requisite	None
Catalogue Description	The goals of this course are to provide graduate students with an understanding of network security. Upon completion of the course, the students will be able to understand the basics of Network security, authentication, security protocol design and analysis, security modeling, trusted computing, key management, program safety, intrusion detection, DDOS detection and mitigation, architecture/operating systems security, security policy, group systems, biometrics, web security, and other emerging topics.

Subject Code	CNE 504
Course Title	Introduction to Robotics
Credit hours	3 (2,0,2)
Level	9
Pre-Requisite	MATH 246 Linear Algebra
Co-Requisite	None
Catalogue Description	This course is designed to cover theoretical and practical aspects of robotics. Topics covered include: history of robots, types of robots, 2D and 3D transformations, forward and inverse kinematics, manipulator velocity. This course also introduces the structure and control of different types of robotic systems (with real-life applications) and make the student aware of the basic principles, forward and inverse kinematics of robots.

Subject Code	CNE 591
Course Title	Graduation Project (1)
Credit hours	3 (0, 0, 6)
Level	9
Pre-Requisite	Senior Standing (Achieving 130+ Credit Hours)
Co-Requisite	None
Catalogue Description	The student proposes a project topic or idea according to his background of specialization with technical merit under supervision of academic members in the college. Topics included, Discussion and explain the ways of choice graduation project with students. Assign references to students to read about the project after determining the subject of the project. Discussion with students the methods to build the project and Identified tasks and a tentative work plan for project. Theoretical explanation about how to build the project and prepare the report Open discussion about what has been accomplished over the previous period with students. Final presentation of the graduation project I. Presentation of the graduation project to the Graduate Projects Arbitration Committee.

8. Level 10

Subject Code	GE 403
Course Title	Engineering Economy
Credit hours	2 (2,1,0)
Level	10
Pre-Requisite	None
Co-Requisite	None
Catalogue Description	This course Introduces the engineering economics to present work analysis, financial management, cash flow points, taxes, and project breakeven structures. Including the sensitivity analysis for a particular project. This course also designed to cover the steps to evaluate the economic feasibility of investments related to engineering projects. Assess the impact of depreciation, taxation, and other economic factors on projects feasibility. Conduct sensitivity analysis on key compounding parameters. Make financially prudent decisions in everyday life.

Subject Code	GE 490
Course Title	Ethics and Professional Practice
Credit hours	2 (2,1,2)
Level	10
Pre-Requisite	None
Co-Requisite	None
Catalogue Description	This course introduces topics including introducing themes and guidelines that addresses and debates issues related to ethics in the engineering profession. The course is designed to familiarize students with the ethical dilemmas, ethical governmental regulations, and ethical decision making by professional engineers. Introducing the students to the conceptual groundwork of the professional engineering ethics. Providing them with an appropriate training considering ethicals while solving the problem. Increasing the student's verbal and communication skills.

Subject Code	CNE 502
Course Title	Digital Control Systems
Credit hours	3 (0, 0, 6)
Level	10
Pre-Requisite	CSC 591 - Graduation Project (1)
Co-Requisite	None
Catalogue Description	The students show their maturity in handling the graduation project (GP) by making significant progress as planned in the GP (1). By the end of the semester, the students should be able to implement and complete their projects successfully. Then, the students submit the final GP report and present their achievement and contribution to be judged by supervisors and GP committee members. Topics included, Review of Graduation Project 1 design, Project 2 planning and schedule, Programming language review, UI coding review Coding (implementation), best practices, Implementation of the project (and processing requirements), Back-end implementation; testing, Back-end implementation; documentation, Front-end, implementation; testing; documentation, Middle tier implementation; testing; documentation, Function and system testing; documentation, Conclusion and future work , Final report preparation (Including Graduation Project 1) Presentation of the graduation project to the Graduate Projects Arbitration Committee

Subject Code	CIT 506
Course Title	Computer Ethics
Credit hours	3 (2, 0, 2)
Level	10
Pre-Requisite	None
Co-Requisite	None
Catalogue Description	This course introduces topics including Understanding the Need for Computer Ethics Training and Historical Milestones, Defining the Field of Computer Ethics, Developing the Ethical Analysis Skills and Professional Values, Enhance the student research methodology using the research skills. Topics included, Ethics Overview, Ethical Principals, Computer Ethics, Evolution of computer ethics issues, Is computer ethics different from other kinds of ethics, The uniqueness of the computer, Computer ethics as a field of professional ethics, Case, Studies: E-mail & Spam, the Cyber City Network, Intellectual Property and Changing, Technology, Privacy and Computer Technology, Ethical Hacking, Relevant Laws (Computer Crime, IP, Licensing, Privacy).

9. Elective Courses

Subject Code	CSC 406
Course Title	Deep Learning
Credit hours	3 (2, 0, 2)
Level	
Pre-Requisite	CSC 403 - Artificial Intelligence
Co-Requisite	None
Catalogue Description	In this course Students will learn about the basics of deep neural networks, and their applications to various artificial intelligence tasks. Topics included, Introduction to Deep Learning, Neural Network Representation, Learning the Neural Network, Neural Network Optimization, Network Normalization, Regularization, Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Attention Models, Generative Adversarial Networks (GAN), Case Studies.

Subject Code	CSC 507
Course Title	Image Processing
Credit hours	3(2,2,0)
Level	
Pre-Requisite	CSC 406 Deep Learning
Co-Requisite	None
Catalogue Description	The course aims are to study the image fundamentals and mathematical transforms necessary for image processing. Topics included, Digital Image Fundamentals, Intensity Transformations and Spatial Filtering, Filtering in the frequency domain, Color Image processing, Introduction to Image compression, Morphological image processing, Image segmentation, Introduction to image representation and description, Introduction to object recognition.

Subject Code	CSC 508
Course Title	Speech Processing
Credit hours	3 (2, 0, 2)
Level	
Pre-Requisite	CSC 507 - Image Processing
Co-Requisite	None
Catalogue Description	This course focuses on methods for recording speech and other vocal signals, for processing and modifying such recordings, and for synthesizing artificial speech. Topics included, Introduction, recording and file I/O, Visualization, Voice detection, Phonetic transcription, Pitch and formant detection, Human Audition, Voice manipulation, Speech and vocalization synthesis, Term project workshop, Term project presentations.

Subject Code	CSC 510
Course Title	Computer Vision
Credit hours	3(2,0,2)
Level	
Pre-Requisite	CSC 507 – Image Processing
Co-Requisite	None
Catalogue Description	This course covers topics such as Introduction to computer vision, image and video processing, motion estimation, face recognition and gesture recognition, computer vision applications. Topics included, Introduction to Computer Vision, Image and Video Processing, Deep Learning for Computer Vision, Recognition, Feature detection and description, Motion, Estimation, Face Recognition and Gesture Recognition, Case Studies.

Subject Code	CSC 408
Course Title	Software Design Patterns
Credit hours	3 (2, 0, 2)
Level	
Pre-Requisite	CSC 353 - Computer Graphics
Co-Requisite	None
Catalogue Description	This course covers basic programming concepts, data structures, and techniques specifically relevant to game design. Topics included, Agile Development, The Payroll Case Study, Singleton and Monostate, Null Object, Packaging the Payroll System, The Weather Station Case Study, Abstract Server, Adapter, and Bridge, Proxy and Stairway to Heaven: Managing Third Party APIs.

Subject Code	CSC 434
Course Title	Applied Coding for game designers
Credit hours	3 (2, 0, 2)
Level	
Pre-Requisite	CSC 353 - Computer Graphics
Co-Requisite	None
Catalogue Description	This course covers basic programming concepts, data structures, and techniques specifically relevant to game design. Topics included, Introduction to game coding, Text Battle, Text Adventure, ASCII Dungeon, animation using sprites and the Simple Direct Media Layer (SDL), Unity 5 Building the Game Programming Foundation with Unity, Unity, Interface/Layout and Creating Scenes/Transitions and Manipulation of Objects, Introduction to JavaScript. Code structure, syntax, terminology, first script; create and manage variables and functions; logistics of methods and statements, Adding interaction with JavaScript: manage collision detection, destroy objects, manage scenes through code, update user interface with scripting, polishing the game, Adding and managing simple Artificial Intelligence; Use AI to, create intelligence; develop program code to execute and manage, Create and publish simple mobile games to the web and mobile devices.

Subject Code	CSC 509
Course Title	Mobile Computing
Credit hours	3 (2, 0, 2)
Level	
Pre-Requisite	CSC 408 – Software Design Patterns
Co-Requisite	None
Catalogue Description	This course covers software mobile application development, its architecture and lifecycle, as well as its inherent design considerations. Topics included, Fundamental of Mobile Computing Infrastructures for Mobile Computing Applications, Mobile Computing Technologies, Mobile Computing Applications, Mobile Device Platforms, Wireless Mobile Internet, Mobility, Management, Location-Based Services, Security of mobile computing.

Subject Code	CSC 511
Course Title	Computer Animation for Games
Credit hours	3 (2, 0, 2)
Level	
Pre-Requisite	CSC 434 - Applied Coding for Game Designers
Co-Requisite	None
Catalogue Description	After completing this course, the students will be able to create games and animations on the PC as well as on Mobile Telephony phones and related devices. Topics included, Computer Gaming Overview, Fundamentals of Animation, Graphics & its Tools, 2D Animation Using Flash, Fundamentals of Game Development, Advanced Visual Graphics, Maya Fundamentals, 3DS Max Fundamentals, Advanced Flash Animation, Scripting for Animation & Games, Web Graphics and Games, Industry of Gaming.

Subject Code	CSC512
Course Title	Automated Software Testing
Credit hours	3 (2, 0, 2)
Level	
Pre-Requisite	CSC 509 - Mobile Computing
Co-Requisite	None
Catalogue Description	This course explains the objectives, advantages, disadvantages, and limitations of test automation. Identify technical success factors of a test automation project. Topics included, Quality Assurance, Software quality factors, Development standards, models and methodologies, Process and product quality assurance. Software reviews and inspections., Verification and validation methods, Software configuration management, Software quality metrics.

Subject Code	CSC 514
Course Title	Computational Geometry
Credit hours	3 (2, 0, 2)
Level	
Pre-Requisite	CSC 509 - Mobile Computing
Co-Requisite	None
Catalogue Description	This course introduces students to the essentials of Computational Geometry and presents an in-depth study of the fundamental geometric structures and techniques used in this field. Topics included, Computational Geometry Overview, Convex Hulls, Line Segment Intersection, Triangulation, Orthogonal Range Searching And Point Location, Voronoi Diagrams, Delaunay Triangulations, Boolean Operations On Polygons, Robot Motion Planning, Visibility Graph, Simplex Range Searching.

Subject Code	CSC 516
Course Title	Digital Painting for Games
Credit hours	3 (2, 0, 2)
Level	
Pre-Requisite	CSC 511 - Computer Animation for Games
Co-Requisite	None
Catalogue Description	This course is designed to introduce individuals to the fundamentals of creating game artwork from an industry perspective. Topics included, Introduction to Digital Painting, Principles and Tools Fundamental tools of image manipulation, Blending and lighting, Brushes/ Materials, Image Creation thru Abstraction, Atmospheric Perspective/Kit bashing, Vector Tools, Concept Art, Design, and apply texture to, a bladed weapon, Simple to Complex Approach to Image Creation.

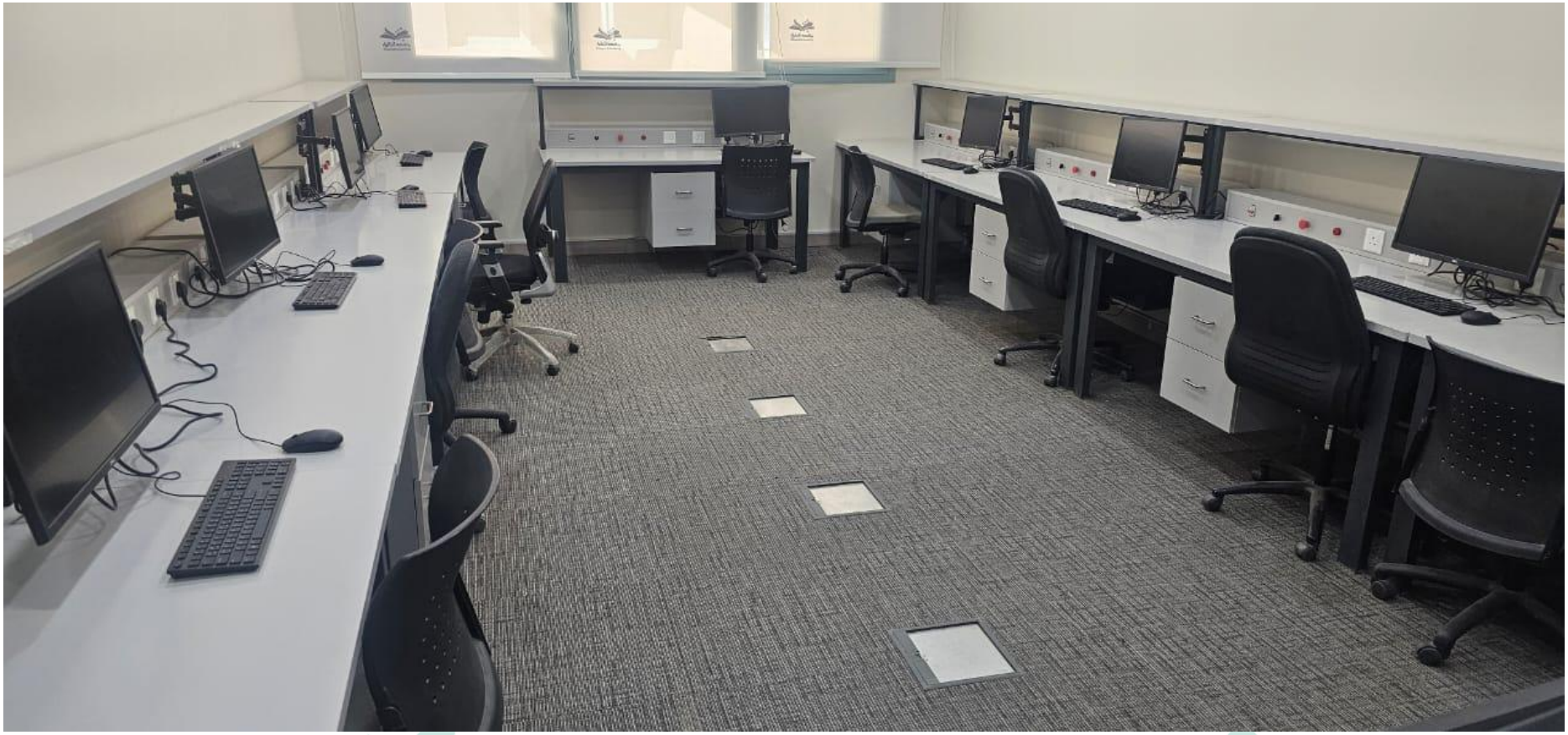
Subject Code	CSC 518
Course Title	Advanced Game Animation
Credit hours	3 (2, 0, 2)
Level	
Pre-Requisite	CSC 511 - Computer Animation for Games
Co-Requisite	None
Catalogue Description	This course is aimed to provide students an insight into the methods and techniques used within both animation and game design; and examine core concepts/principles and design processes. Topics included, Fundamentals of animation and game development, Understand timing and spacing, Mediums and techniques, Animation showcase, Animation techniques, Using morphing, blending technique in 2D classical animation, Animate a concept, synchronizing with sound effects., Game Design, Debugging Games

BCNE Program Laboratories

The BCNE program has a total of 5 computer laboratories. All the laboratories contain PCs that run Microsoft Windows. The average capacity of the laboratory is 20 students (or PC).

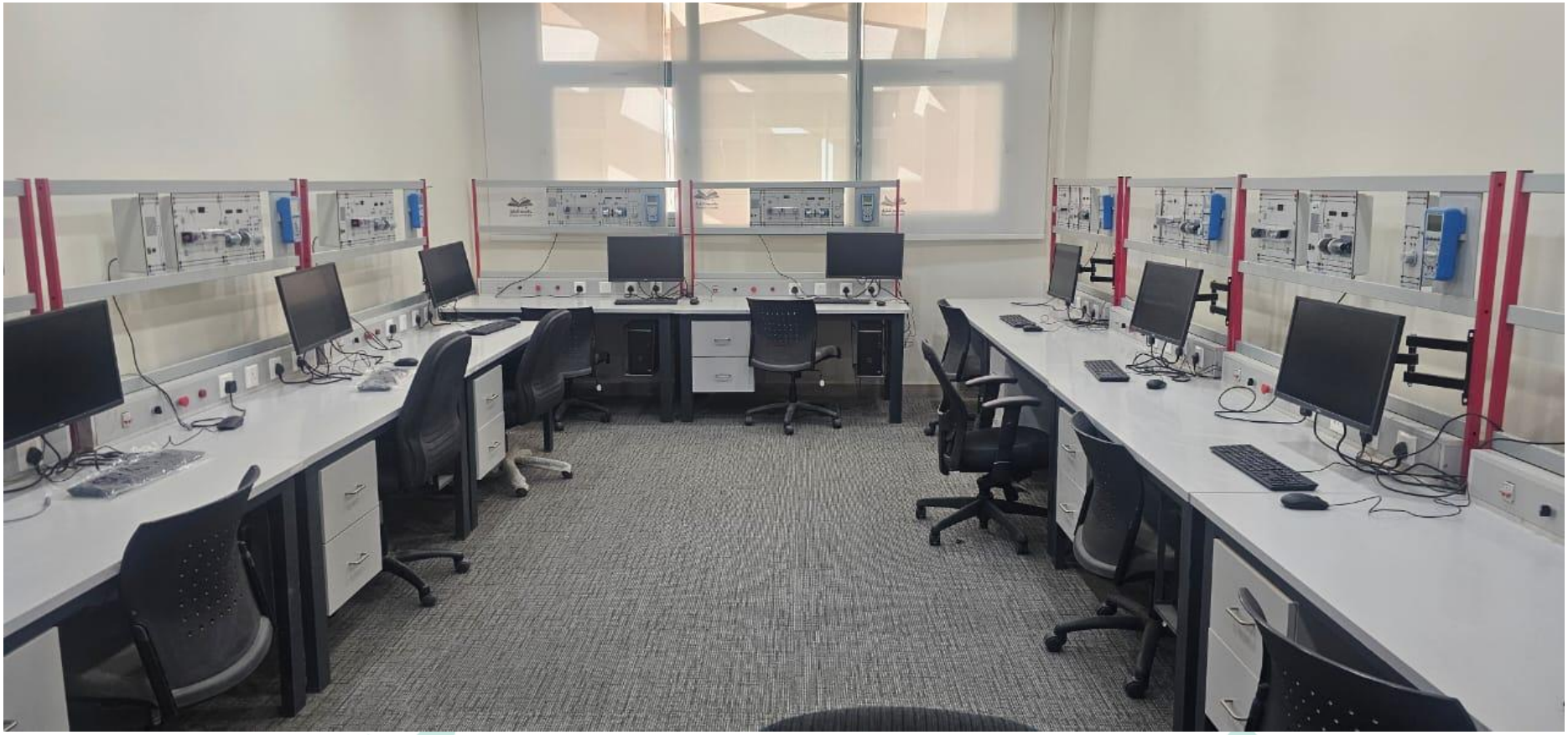
1. Circuits Lab

2. Digital Logic Lab



3. Electronics Lab

4. Control Lab



5. Embedded Systems Lab