COLLEGE OF ENGINEERING & APPLIED SCIENCES

5

COLLEGE OF ENGINEERING & APPLIED SCIENCES

OFFICE OF THE DEAN

MISSION

The College of Engineering and Applied Sciences (CEAS) is committed to cultivating an inspiring and innovative learning environment that contributes to a culture of lifelong learning driven by the core values of liberal arts education. In its pursuit of excellence in teaching, research and community engagement, the College offers high quality programs in Engineering and Computing.

VISION

CEAS aims to establish a presence as a leading college recognized locally, regionally and internationally for offering high quality education in different fields of engineering and computing, innovative multi-disciplinary research and the positive contributions of its graduates.

VALUES

The values of the College of Engineering and Applied Sciences are:

- **Excellence:** Commitment to high quality teaching and research.
- **Integrity:** Commitment to professional standards and ethics.
- **Creativity:** Fostering ingenuity and innovation.
- **Collaboration:** Encouraging cross-discipline and cross-border partnerships.
- **Professionalism:** Reflecting collegiality, leadership, and civic responsibility.

PROGRAM ACCREDITATION

Accreditation Board for Engineering & Technology (ABET)

The BE degree program in Computer Engineering is accredited by the Engineering Accreditation Commission of ABET, the global accreditor of college and university programs in applied science, computing, engineering, and engineering technology.

The BE degree program in Electrical Engineering is accredited by the ABET Engineering Accreditation Commission, the global accreditor of college and university programs in applied science, computing, engineering, and engineering technology.

Computing Accreditation Commission (ABET)
The BSc degree program in Computer Science is accredited by the ABET Computing Accreditation Commission, the global accreditor of college and university programs in applied science, computing, engineering, and engineering technology.

UNDERGRADUATE PROGRAMS

Students entering the College of Engineering and Applied Sciences select one of the following programs:

- Bachelor of Engineering (BE)
- Bachelor of Science (BS)

Within these two programs, students can choose between five different majors.

Department of Engineering

- BE in Computer Engineering
- BE in Electrical Engineering
- BE in Systems Engineering

Department of Computing

- BS in Computer Science
- BS in Information Systems

DEPARTMENT OF ENGINEERING

The world we live in has become increasingly dependent on advances made in part by electrical, computer, and systems engineering. The impact of these three engineering fields span a wide spectrum of life aspects ranging from energy, electrical power, sustainable development, and communications, to computers and computer networks, to instruments for all sectors of society from entertainment to healthcare, and from space exploration to ocean exploration. Computer engineers are improving the ability of computers to 'see' and 'think'. They are making computers more mobile, and even incorporating computers into fabrics, clothes, and almost all industries. Electrical engineers are exploring renewable energy sources, leading sustainable development, promoting modern control of industrial machinery, to name a few. Systems engineers are concerned with managing medium to large-scale engineering projects and the effective design, production, deployment, operation, maintenance, and refinement of reliable industrial systems within constraints.

The electrical, computer, and systems engineering programs at AUK prepare future engineering leaders through an innovative engineering education that bridges science and engineering, enterprise, and the society. Their curricula are built on four pillars: math & science; electrical, computer, or systems engineering design; arts, humanities & social sciences; and entrepreneurship. The math & science sequence teaches fundamental ideas and techniques whose application makes engineering possible. Under the design pillar, students complete design projects that enable them to apply technical and non-technical knowledge and skills, develop understanding of design process, identify and define problems and muster the resources necessary to realize solutions. This process comes to a synthesis in a yearlong capstone design course. Under the arts, humanities & social sciences pillar, students develop a broad knowledge of social, cultural, and humanistic contexts and foster the ability to apply contextual thinking in the study of electrical, computer, or systems engineering and other disciplines. Entrepreneurship is the process of identifying opportunities, fulfilling human needs, and creating value. Under this pillar, AUK's electrical, computer, or systems engineering students will demonstrate a capacity to identify social, technical, and economic opportunities to predict challenges and the cost associated with the pursuit of opportunities, and to make decisions about which opportunities are worthy of pursuit.

Typical industries hiring electrical, computer, and/or systems engineers include both private & government sectors such as financial services, computer software & hardware companies, petroleum & chemical companies, defense & interior contractors, consulting, transportation, power, manufacturing, and consumer goods, to name a few. Electrical, computer, or systems engineers are equally successful in large multinational firms and small startups.

The American University of Kuwait offers a dual degree program in conjunction with Dartmouth College's Thayer School of Engineering, which allows AUK students to earn a Bachelor of Engineering (BE) degree in Computer Engineering at AUK, and a Bachelor of Engineering (BE) degree in General Engineering from the Thayer School of Engineering after five years of study. Refer to the dual degree engineering program section for more information.

UNDERGRADUATE PROGRAMS

The Department of Engineering offers three undergraduate programs that lead to the degree of Bachelor of Engineering:

- Computer Engineering (CPEG)
- Electrical Engineering (ELEG)
- Systems Engineering (STEG)

MISSION STATEMENT

The Department of Engineering strives to provide high-quality engineering education centered around the key principles of liberal arts, specifically, lifelong learning, critical thinking, and effective communication. The Department prepares students to become successful engineers and be able to contribute effectively to their profession and community.

VALUES

- Freedom of thought, expression, and intellectual inquiry.
- Respect for individual identity and rights, and cultural diversity.
- Adherence to the standards of modern and high-quality engineering education.
- Commitment to professional and ethical responsibility.
- Promoting innovation and successful contributions to the society.

VISION

The Department of Engineering aspires to be recognized locally, regionally, and internationally for providing quality engineering education.

PROGRAM EDUCATIONAL OBJECTIVES

The objectives of the ELEG, CPEG, and STEG programs are to graduate students who:

- Communicate effectively with professionals from different areas of specialization.
- Succeed in an electrical, computer, or systems engineering career by demonstrating leadership and ability to grow professionally in competence.
- Apply principles of electrical, computer, or systems engineering, exhibit critical thinking in problem-solving, and take into consideration ethical and societal impacts.

STUDENT OUTCOMES

By the time of graduation, ELEG, CPEG, and STEG students will possess:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. An ability to apply engineering design to produce solutions that meet specific needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

3. An ability to communicate effectively with a range of audiences.

4. An ability to 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.

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

ADMISSION TO THE PROGRAMS

Admission to the computer, electrical, or systems engineering program takes place upon the successful completion of the course MATH 110 with a grade of (C-).

Transfer equivalencies from ABET accredited programs (**http://www.abet.org**) or equivalent will be considered. We also accept transfer from non-accredited programs for the courses that do not fall under the prefixes CPEG, ELEG, STEG, ENGR, or CSIS.

BACHELOR OF ENGINEERING IN COMPUTER ENGINEERING

UNIVERSITY DEGREE REQUIREMENTS (144 CREDIT HOURS):

To receive a Bachelor of Engineering in Computer Engineering, students must complete at least 144 credit hours. Students are required to complete a minimum of 30 credit hours of upper-level courses (300-level or above) at AUK, of which at least 18 credit hours need to be taken in the major.

General Education Requirements, composed of:		**(49)**
• Related field requirements applicable to Gen Ed requirements	(16)	
• Remaining Gen Ed requirements	(33)	
Related Field Requirements not applicable to Gen Ed		**(26)**
Major Requirements composed of:		**(69)**
• Computer Engineering Core	(55)	
• Computer Engineering Electives	(14)	

MAJOR REQUIREMENTS (69 CREDIT HOURS)

Students must complete all courses (55 credit hours) listed in the computer engineering core courses and four elective courses and two lab electives (14 credit hours) from the computer engineering course electives.

Computer Engineering Core Courses (55 credit hours)

CPEG 210	Digital Logic Design	(3)
CPEG 210L	Digital Logic Design Laboratory	(1)
CPEG 220	Computer Organization and Architecture	(3)
CPEG 330	Microprocessors and Interfacing	(3)
CPEG 330L	Microprocessors and Interfacing Laboratory	(1)
CPEG 340	Embedded System Design	(3)
CPEG 340L	Embedded System Design Laboratory	(1)
CPEG 350	Data and Computer Communications	(3)
CPEG 440	Computer Networks	(3)
CPEG 475	Senior Design Capstone I	(3)
CPEG 480	Senior Design Capstone II	(3)
CSIS 130	Computer Programming II	(4)[T]
CSIS 210	Data Structures and Algorithms	(3)
CSIS 310	Introduction to Operating Systems	(3)
CSIS 330	Software Engineering	(3)
ELEG 220	Electric Circuits	(3)
ELEG 220L	Electric Circuits Laboratory	(1)
ELEG 270	Electronics	(3)
ELEG 270L	Electronics Laboratory	(1)
ELEG 320	Signals and Systems	(3)
ELEG 320L	Signals and Systems Laboratory	(1)
ENGR 330	Engineering Economics	(3)

Computer Engineering Course Electives (14 credit hours)

Four course electives (12 credit hours) and two lab electives (2 credit hours) must be selected in consultation with the academic advisor from 200-level or higher CPEG, ELEG, STEG, ENGR, and/or CSIS courses. The electives must be chosen according to the following rules:

- At least two of the course electives must be CPEG courses.
- At least one of the lab electives must be a CPEG lab.
- At least two of the course electives must be 300-level or higher courses.
- **A maximum of one course elective can be selected from the following CSIS courses:**

CSIS 230	Programming in a Second Language	(3)
CSIS 250	Database Systems	(3)

CSIS 255	Web Technologies	(3)
CSIS 260	System Analysis and Design	(3)
CSIS 300	E-Commerce	(3)
CSIS 320	Principles of Programming Languages	(3)
CSIS 370	Computer Graphics	(3)
CSIS 400	Theory of Computation	(3)
CSIS 401	Mobile Computing	(3)
CSIS 405	Analysis of Algorithms	(3)
CSIS 415	Artificial Intelligence	(3)
CSIS 425	Advanced Software Engineering	(3)
CSIS 440	Software Project Management	(3)
CSIS 476	Computer Security and Information Assurance	(3)

The remaining **course electives** are restricted to the following:

CPEG 369	Short Course	(1-3)
CPEG 388	Independent Study	(1-4)
CPEG 389	Special Topics in Computer Engineering	(3)
CPEG 390	Introduction to the Internet of Things	(3)
CPEG 422	Digital Signal Processing	(3)
CPEG 430	Introduction of Soft Computing	(3)
CPEG 441	Hardware/Software Co-Design	(3)
CPEG 450	Network Security	(3)
CPEG 455	Wireless Networks and Mobile Systems	(3)
CPEG 460	Robotics	(3)
CPEG 470	Internship in Computer Engineering	(1-3)
ELEG 300	Engineering Electromagnetics	(3)
ELEG 305	Introduction to Biomedical Engineering	(3)
ELEG 321	Analog and Digital Filers	(3)
ELEG 323	Measurement and Instrumentation	(3)
ELEG 325	Communication Systems	(3)
ELEG 389	Special Topics in Electrical Engineering	(3)
ELEG 421	Control Systems	(3)
ELEG 422	Digital Control Systems	(3)
ELEG 450	Modern Antennas in Wireless Telecommunications	(3)
ELEG 472	CMOS Digital Circuit Design	(3)
STEG 220	Engineering Statistical Analysis	(3)
STEG 330	Operations Research I	(3)
STEG 340	Engineering Project Management	(3)
STEG 341	Production and Operations Management	(3)
STEG 345	Quality Control	(3)

STEG 350	Human Factors Engineering	(3)
STEG 389	Special Topics in Systems Engineering	(3)
STEG 451	Health and Safety Engineering	(3)
ENGR 200	Engineering Design	(3)
ENGR 300	Engineering Ethics	(3)
ENGR 310	Engineering Entrepreneurship II	(3)
ENGR 389	Special Topics	(3)

Lab Electives are restricted to the following:

CPEG 201L	Matlab Programming Laboratory	(1)
CPEG 303L	Advanced Programming for Engineers Laboratory	(1)
CPEG 331L	Automation and Data Acquisition Laboratory	(1)
CPEG 350L	Data and Computer Communications Laboratory	(1)
ELEG 301L	Programmable Logic Controllers Laboratory	(1)
ELEG 323L	Measurement and Instrumentation Laboratory	(1)
ELEG 421L	Control Systems Laboratory	(1)
STEG 220L	Engineering Statistical Analysis Laboratory	(1)
STEG 340L	Engineering Project Management Laboratory	(1)

RELATED FIELD REQUIREMENTS (42 CREDIT HOURS)

The related field requirements component is composed of six math courses (20 credit hours), three science courses (12 credit hours), one computer science course (4 credit hours), and two management and entrepreneurship courses (6 credit hours). Students must complete:

Math Courses (20 credit hours)

MATH 201	Calculus I	(3)[M]
MATH 203	Calculus II	(3)[M]
MATH 207	Advanced Engineering Mathematics	(4)
MATH 210	Differential Equations	(3)[M]
MATH 213	Discrete Mathematics	(3)[M]
STAT 214	Statistics for Engineers	(4)[M]

Sciences Courses (12 credit hours)

PHYS 115	General Physics I	(3)[P]
PHYS 115L	General Physics I Laboratory	(1)[P]

PHYS 116	General Physics II	(3)[P]
PHYS 116L	General Physics II Laboratory	(1)[P]
CHEM 101	General Chemistry I	(3)[P]
CHEM 101L	General Chemistry Laboratory I	(1)[P]

Computer Science Course (4 credit hours)

CSIS 120	Computer Programming I	(4)[T]

Management and Entrepreneurship Courses (6 credit hours)

MGMT 201	Principles of Management	(3)
ENGR 210	Engineering Entrepreneurship I	(3)

DUAL DEGREE PROGRAM WITH DARTMOUTH'S THAYER SCHOOL OF ENGINEERING

This initiative provides an opportunity for AUK students to go to Thayer School of Engineering at Dartmouth College for a summer term (preferably sophomore year), and then to return for a 5th year after completing the requirements for the AUK Bachelor of Engineering (BE) degree in Computer Engineering. Upon successful completion of their AUK BE and the 5th year at Dartmouth, students would earn an ABET-accredited BE degree at Dartmouth. The Thayer School of Engineering degree is in General Engineering (not in Computer Engineering). Thayer is one of the top engineering schools in the United States. It is known for a distinctive curriculum, which emphasizes breadth of engineering training in a highly collaborative learning environment. AUK students admitted to this special program will study with Dartmouth faculty and students in Thayer's state of the art facilities.

See: **http://engineering.dartmouth.edu/about/maclean.html**

Admission to the summer program at Dartmouth is based on prior academic performance and recommendation letters. Admission to the 5th-year program is based primarily on performance in the summer program at Dartmouth. No more than 10 students annually will be accepted into the program in its first two years; this is subject to admissions criteria. The cap may be adjusted after a trial period of two years.

Incoming students will receive program-specific orientation at Dartmouth, and AUK students will have seen substantial amounts of the material for Engineering Sciences 21 (ENGS 21), which will ease their transition. ENGS 21 is essential preparation for the 190-290 sequence of courses students will take upon their return to Dartmouth for the 5th Thayer BE year. AUK students will take all core courses required of Dartmouth AB and BE students (see list below). These courses are listed in the Thayer School of Engineering Catalog:

http://engineering.dartmouth.edu/undergraduate/index.html

SUMMER TERM

ENGS 21

ENGS 22

ENGS 33 (or 25)

SAMPLE BE YEAR PROGRAM (YEAR 5)

Fall	Winter	Spring
ENGS 190 (2A)	ENGS 290 (arr)	ENGS 112 (11)
ENGS 91 (12)	ENGS 27 (2)	ENGS 23 (9L)
ENGS 116 (10)	ENGS 24 (10)	ENGS 31 (12)

There are variations possible on this schedule depending on student interest. For more information on Thayer School of Engineering **http://engineering.dartmouth.edu/about/index.html.**

BACHELOR OF ENGINEERING IN ELECTRICAL ENGINEERING

UNIVERSITY DEGREE REQUIREMENTS (144 CREDIT HOURS):

To earn a Bachelor of Engineering in Electrical Engineering, students must complete at least 144 credit hours. Students are required to complete a minimum of 30 credit hours of upper-level courses (300-level or above) at AUK, of which at least 18 credits hours need to be taken in the major:

General Education Requirements, composed of		*(49)*
• Related field requirements applicable to Gen Ed requirements	(16)	
• Remaining Gen Ed requirements (33)	(33)	
Related Field Requirements not applicable to Gen Ed		*(26)*
Major Requirements composed of:		*(69)*
• Electrical Engineering Core	(55)	
• Electrical Engineering Electives	(14)	

MAJOR REQUIREMENTS (69 CREDIT HOURS)

Students must complete all courses (55 credit hours) listed in the electrical engineering core courses and four elective courses and two lab electives (14 credit hours) from the electrical engineering course electives.

Electrical Engineering Core Courses (55 credit hours)

CPEG 210	Digital Logic Design	(3)
CPEG 210L	Digital Logic Design Laboratory	(1)
CPEG 220	Computer Organization and Architecture	(3)
CPEG 350	Data and Computer Communications	(3)
CSIS 130	Computer Programming II	(4)[T]
CSIS 210	Data Structures and Algorithms	(3)
ELEG 220	Electric Circuits	(3)
ELEG 220L	Electric Circuits Laboratory	(1)
ELEG 270	Electronics	(3)
ELEG 270L	Electronics Laboratory	(1)
ELEG 300	Engineering Electromagnetics	(3)

ELEG 310	Electric Machines and Power Fundamentals	(3)
ELEG 310L	Electric Machines Laboratory	(1)
ELEG 320	Signals and Systems	(3)
ELEG 320L	Signals and Systems Laboratory	(1)
ELEG 330	Power System Analysis	(3)
ELEG 330L	Power Systems Laboratory	(1)
ELEG 421	Control Systems	(3)
ELEG 471	Power Electronics	(3)
ELEG 475	Senior Design Capstone I	(3)
ELEG 480	Senior Design Capstone II	(3)
ENGR 330	Engineering Economics	(3)

Electrical Engineering Course Electives (14 credit hours)

Four course electives (12 credit hours) and two lab electives (2 credit hours) must be selected in consultation with the academic advisor from 200-level or higher CPEG, ELEG, STEG, and/or ENGR courses. The electives must be chosen according to the following rules:

- At least two of the course electives must be ELEG courses.
- At least one of the lab electives must be an ELEG lab.
- At least two of the course electives must be 300-level or higher courses.

Course electives are restricted to the following:

CPEG 330	Microprocessors & Interfacing	(3)
CPEG 340	Embedded System Design	(3)
CPEG 389	Special Topics in Computer Engineering	(3)
CPEG 390	Introduction to the Internet of Things	(3)
CPEG 422	Digital Signal Processing	(3)
CPEG 430	Introduction of Soft Computing	(3)
CPEG 441	Hardware/Software Co-Design	(3)
CPEG 450	Network Security	(3)
CPEG 455	Wireless Networks and Mobile Systems	(3)
CPEG 460	Robotics	(3)
ELEG 305	Introduction to Biomedical Engineering	(3)
ELEG 311	Power Distribution and Utilization	(3)
ELEG 321	Analog and Digital Filters	(3)
ELEG 323	Measurement and Instrumentation	(3)
ELEG 325	Communication Systems	(3)
ELEG 331	Power System Protection	(3)
ELEG 340	Fundamentals of High Voltage Engineering	(3)
ELEG 369	Short Course	(1-3)
ELEG 388	Independent Study	(1-4)
ELEG 389	Special Topics in Electrical Engineering	(3)

ELEG 411	Electric Drives	(3)
ELEG 412	Renewable Energy Systems	(3)
ELEG 422	Digital Control Systems	(3)
ELEG 450	Modern Antennas in Wireless Telecommunications	(3)
ELEG 470	Internship in Electrical Engineering	(1-3)
ELEG 472	CMOS Digital Circuit Design	(3)
STEG 220	Engineering Statistical Analysis	(3)
STEG 330	Operations Research I	(3)
STEG 340	Engineering Project Management	(3)
STEG 341	Production and Operations Management	(3)
STEG 345	Quality Control	(3)
STEG 350	Human Factors Engineering	(3)
STEG 389	Special Topics in Systems Engineering	(3)
STEG 451	Health and Safety Engineering	(3)
ENGR 200	Engineering Design	(3)
ENGR 300	Engineering Ethics	(3)
ENGR 310	Engineering Entrepreneurship II	(3)
ENGR 389	Special Topics	(3)

Lab Electives are restricted to the following:

CPEG 201L	Matlab Programming Laboratory	(1)
CPEG 330L	Microprocessors and Interfacing Laboratory	(1)
CPEG 331L	Automation and Data Acquisition Laboratory	(1)
CPEG 340L	Embedded System Design Laboratory	(1)
CPEG 350L	Data Communications and Computer Networks Laboratory	(1)
ELEG 301L	Programmable Logic Controllers Laboratory	(1)
ELEG 323L	Measurement and Instrumentation Laboratory	(1)
ELEG 331L	Power System Protection Laboratory	(1)
ELEG 421L	Control Systems Laboratory	(1)
ELEG 471L	Power Electronics Laboratory	(1)
STEG 220L	Engineering Statistical Analysis Laboratory	(1)
STEG 340L	Engineering Project Management Laboratory	(1)

RELATED FIELD REQUIREMENTS (42 CREDIT HOURS)

The related field requirement component is composed of six math courses (20 credit hours), three science courses (12 credit hours), one computer science course (4 credit hours), and two management and entrepreneurship courses (6 credit hours). Students must complete:

Math Courses (20 credit hours)

MATH 201	Calculus I	(3)[M]
MATH 203	Calculus II	(3)[M]
MATH 207	Advanced Engineering Mathematics	(4)

MATH 210	Differential Equations	(3)[M]
MATH 213	Discrete Mathematics	(3)[M]
STAT 214	Statistics for Engineers	(4)[M]

Sciences Courses (12 credit hours)

PHYS 115	General Physics I	(3)[P]
PHYS 115L	General Physics I Laboratory	(1)[P]
PHYS 116	General Physics II	(3)[P]
PHYS 116L	General Physics II Laboratory	(1)[P]
CHEM 101	General Chemistry I	(3)[P]
CHEM 101L	General Chemistry Laboratory I	(1)[P]

Computer Science Course (4 credit hours)

CSIS 120	Computer Programming I	(4)[T]

Management and Entrepreneurship Courses (6 credit hours)

MGMT 201	Principles of Management	(3)
ENGR 210	Engineering Entrepreneurship I	(3)

BACHELOR OF ENGINEERING IN SYSTEMS ENGINEERING

UNIVERSITY DEGREE REQUIREMENTS (144 CREDIT HOURS):

To receive a Bachelor of Engineering in Systems Engineering students must complete at least 144 credit hours. Students are required to complete a minimum of 30 credit hours of upper-level courses (300-level or above) at AUK, of which at least 18 credits hours need to be taken in the major:

General Education Requirements, composed of		*(49)*
• Related field requirements applicable to Gen Ed requirements	(16)	
• Remaining Gen Ed requirements (33)	(33)	
Related Field Requirements not applicable to Gen Ed		*(26)*
Major Requirements composed of:		*(69)*
• Systems Engineering Core	(55)	
• Systems Engineering Electives	(14)	

MAJOR REQUIREMENTS (69 CREDIT HOURS)

Students must complete all courses (55 credit hours) listed in the systems engineering core courses and four elective courses and two lab electives (14 credit hours) from the Systems Engineering course electives.

Systems Engineering Core Courses (55)

STEG 210	Dynamic Systems	(3)
STEG 210L	Dynamic Systems Laboratory	(1)
STEG 220	Engineering Statistical Analysis	(3)
STEG 321	Systems Simulation	(3)
STEG 321L	Systems Simulation Laboratory	(1)
STEG 330	Operations Research I	(3)
STEG 331	Operations Research II	(3)
STEG 340	Engineering Project Management	(3)
STEG 341	Production and Operations Management	(3)
STEG 345	Quality Control	(3)
STEG 350	Human Factors Engineering	(3)
STEG 442	Supply Chain Engineering	(3)
STEG 475	Senior Design Capstone I	(3)
STEG 480	Senior Design Capstone II	(3)
ELEG 220	Electric Circuits	(3)
ELEG 220L	Electric Circuits Laboratory	(1)
ELEG 421	Control Systems	(3)
ENGR 200	Engineering Design	(3)
ENGR 330	Engineering Economics	(3)
CSIS 130	Computer Programming II	(4)[T]

Systems Engineering Course Electives (14 credit hours)

Four course electives (12 credit hours) and two lab electives (2 credit hours) must be selected in consultation with the academic advisor from 200-level or higher CPEG, ELEG, STEG, ENGR, and/or CSIS courses. The electives must be chosen according to the following rules:

- At least two of the course electives must be STEG courses.
- At least one of the lab electives must be a STEG lab.
- At least two of the course electives must be 300-level or higher courses.
- A maximum of one course elective could be selected from the following CSIS electives:
    - CSIS 250 Database Systems (3)
    - CSIS 255 Web Technologies (3)

Course electives are restricted to the following:

CPEG 210	Digital Logic Design	(3)
CPEG 221	Computer Systems Engineering	(3)
CPEG 305	Algorithms in Computer Systems Engineering	(1-3)
CPEG 389	Special Topics in Computer Engineering	(3)
ELEG 305	Introduction to Biomedical Engineering	(3)
ELEG 315	Electrical Systems Engineering	(3)
ELEG 323	Measurement and Instrumentation	(3)

ELEG 389	Special Topics in Electrical Engineering	(3)
ELEG 422	Digital Control Systems	(3)
STEG 369	Short Course	(1-3)
STEG 388	Independent Study	(1-4)
STEG 389	Special Topics in Systems Engineering	(3)
STEG 422	Advanced Simulation	(3)
STEG 431	Stochastic Operations Research	(3)
STEG 446	Engineering Reliability	(3)
STEG 451	Health and Safety Engineering	(3)
STEG 452	Productivity Improvement	(3)
STEG 465	Petroleum Engineering	(3)
STEG 470	Internship in Systems Engineering	(1-3)
ENGR 300	Engineering Ethics	(3)
ENGR 389	Special Topics	(3)

Lab Electives are restricted to the following:

CPEG 201L	Matlab Programming Laboratory	(1)
CPEG 210L	Digital Logic Design Laboratory	(1)
CPEG 221L	Computer Systems Engineering Laboratory	(1)
CPEG 331L	Automation and Data Acquisition Laboratory	(1)
ELEG 301L	Programmable Logic Controllers Laboratory	(1)
ELEG 315L	Electrical Systems Engineering Laboratory	(1)
ELEG 323L	Measurement and Instrumentation Laboratory	(1)
ELEG 421L	Control Systems Laboratory	(1)
STEG 220L	Engineering Statistical Analysis Laboratory	(1)
STEG 340L	Engineering Project Management Laboratory	(1)

RELATED FIELD REQUIREMENTS (42 CREDIT HOURS)

The related field requirement component is composed of five math courses (17 credit hours), three science courses (12 credit hours), one computer science course (4 credit hours), and three management and entrepreneurship courses (9 credit hours). Students must complete:

Math Courses (17 credit hours)

MATH 201	Calculus I	(3)[M]
MATH 203	Calculus II	(3)[M]
MATH 207	Advanced Engineering Mathematics	(4)
MATH 210	Differential Equations	(3)[M]
STAT 214	Statistics for Engineers	(4)[M]

Sciences Courses (12 credit hours)

PHYS 115	General Physics I	(3)[P]
PHYS 115L	General Physics I Laboratory	(1)[P]
PHYS 116	General Physics II	(3)[P]
PHYS 116L	General Physics II Laboratory	(1)[P]
CHEM 101	General Chemistry I	(3)[P]
CHEM 101L	General Chemistry Laboratory I	(1)[P]

Computer Science Course (4 credit hours)

CSIS 120	Computer Programming I	(4)[T]

Management and Entrepreneurship Courses (9 credit hours)

MGMT 201	Principles of Management	(3)
ENGR 210	Engineering Entrepreneurship I	(3)
ENGR 310	Engineering Entrepreneurship II	(3)

INTERNSHIP

Eligibility: A student with a cumulative major GPA of at least 2.70 at the beginning of the junior or senior year may elect to pursue an internship course. The internship is completed in the following stages:

1. **Program Discussion:** Potential interns (junior or senior majors) are advised on the nature and purpose of an internship. The essential point is that they learn that there is a significant difference between the theory they learn in the classroom and the practice they will encounter during their internship.

2. **Internship Contract Signed:** The next stage is to have a meeting with the organization that has agreed to provide the internship. At this meeting the nature of the internship is discussed and the student, the off-campus supervisor, and the 470 course instructor sign the form. At this meeting, special details of the internship are agreed upon in the format of a contract between the three parties.

3. **Visit to Place of Work:** At the time of the contract signing, or at a time near to this meeting, the 470 instructor visits the place of work where the student is going to be working and checks that the environment is suitable and that the nature of the work and the place of work go together.

4. **Contact Off-campus Supervisor:** Contact is established between the off-campus supervisor and the 470 instructor to ensure that if any problems arise during the internship there is a clear understanding of the roles each party will play in making sure that the student has a quality learning experience.

5. **Weekly Progress Reports from Intern:** During the period of the internship, interns are expected to email the 470 course instructor every week to report on progress and activity. Students are expected to record their activities so that they can, in the future, review what activities have occupied their time while they were on an internship.

6. **Continuous Assessment of the Intern:** Interns will be required to fill a log-book. They should record their daily activities and have their on-site supervisor sign it at the end of every week. Also, the off-campus supervisor will be consulted by the 470 course instructor one week after the beginning of the internship to make sure that the student successfully started her/his activities.

7. **Intern's Final Report:** At the end of an intern's period of work the intern is required to present a Report of Activity. This report is to record the activities that the student has completed. The program will provide a general template for the report, which is a summary of their log-book. Students may add to the template. Once the report is submitted it is reviewed by the 470 course instructor, additions may be requested during an interview and discussion with the student.

8. **Final Presentation:** The student has to give a public presentation to the department about his/her experience. This may be done on-site, if necessary.

9. **Final Assessment:** Students should obtain a certificate of completion/accomplishment from their off-campus supervisor at the end of their internship. The 470 course instructor then confirms the off-campus supervisor's assessment. After the student presents her/his findings and submits all the required deliverables, the 470 instructor submits the final grade of either Pass or No Pass.

Grade Distribution

- Weekly progress reports 50%
- Work supervisor report 10%
- Final Report 20%
- Final Presentation 20%

Guidelines

- The student is limited to a maximum of 6 credits hours of internship. A maximum of 3 credit hours (taken in increments of 1, 2 or 3 credits) may be applied to the major electives. An additional 3 credit hours of internship may be counted towards a second major, minor or as free electives.

- For the durations of the semester—16 weeks, students should work at least 2.5 hours per week (for 1 credit); 7.5 hours per week (for 3 credits); 10 hours per week (for 4 credits); and 15 hours per week (for 6 credits). A minimum of 120 hours is required for 3 credits, 80 hours for 2 credits, and 40 hours for 1 credit. For the Summer semester, a minimum of 25 hours per week is required (6 weeks).

- The Department of Engineering sets the standards for the internship and reserves the right to decide on the suitability of the work experience.

- The Department of Engineering may assist students to find suitable employment.

- Students are encouraged to find their own placements. However, the Department of Engineering must be advised before a student approaches a prospective organization.

- The 470 instructor will visit the place of work where the student will be working to determine if the environment is suitable and that the nature of the work and place of work are in synergy.

- Contact will be established between the 470 instructors and on-site supervisor to ensure that if any problems arise during the internship, there is a clear understanding of the roles each party will play to ensure that the student has a quality learning experience.
- A placement is not secured until it has been approved by the Department of Engineering, and the student has signed and returned the Student Internship Agreement.
- Students are required to meet with the 470 instructor at least once a week to report on progress and activity.
- Any student who is dismissed from his/her internship must notify the department chair immediately. Failure to do so within a reasonable amount of time will result in a failing grade.

DOUBLE MAJOR IN ELECTRICAL & COMPUTER ENGINEERING

Students pursuing a double major in electrical and computer engineering need to complete at least 164 credit hours to meet the requirements of both majors. Students can choose between the two capstone course sequences CPEG 475 and CPEG 480, or ELEG 475 and ELEG 480; however, the selected capstone project topic must be a cross of both majors. Six course electives (18 credit hours) and two lab electives (2 credit hours) must be selected in consultation with the academic advisor from 200-level or higher CPEG, ELEG, STEG, ENGR, and/or CSIS courses. The electives must be chosen according to the following rules:

1. At least two of the course electives must be CPEG courses.
2. At least two of the course electives must be ELEG courses.
3. A maximum of one CSIS course elective
4. One of the lab electives must be a CPEG lab.
5. One of the lab electives must be an ELEG lab.
6. At least four of the course electives must be 300-level or higher courses.

The course electives are restricted to the following:

CEG Electives:

CPEG 388, 389, 390, 422, 430, 441, 450, 455, 460, 470

ELEG Electives:

ELEG 305, 311, 321, 323, 325, 331, 340, 388, 389, 411, 412, 450, 470, 471, 472

STEG Electives:

STEG 220, 330, 340, 341, 345, 350, 389,451

ENGR Electives:

ENGR 200, 300, 310, 389

CSIS Electives:

CSIS 230, 250, 255, 260, 300, 320, 370, 400, 401, 405, 415, 425, 440, 476

CPEG Lab Electives:

CPEG 201L, 303L, 331L, 350L

ELEG Lab Electives:

ELEG 301L, 323L, 331L, 421L, 471L

STEG Lab Electives:

STEG 220L, 340L

Students joining the double major option after completing a Capstone Course Sequence might need to take a second Capstone Course Sequence depending on their capstone project topic. In the case where a second Capstone Course Sequence is mandated for the student by the Department, four course electives (12 credit hours) and two lab electives (2 credit hours) must be selected in consultation with the academic advisor from 200-level or higher CPEG and ELEG courses. The electives must be chosen according to the following rules and restricted to the lists provided above:

1. Two of the course electives must be CPEG courses.
2. Two of the course electives must be ELEG courses.
3. One of the lab electives must be a CPEG lab.
4. One of the lab electives must be an ELEG lab.
5. At least two of the course electives must be 300-level or higher courses.

Applications from students required to finish less than 144 credit hours for their electrical/computer engineering degree (catalogs prior to AY 2014-15) to join the double major option or to have a second-degree (both AUK and non-AUK graduates) will be considered on a case-by-case basis and might be subject to additional requirements.

IMPORTANT: Scholarship students may not seek a double major unless the required credits for the second major fall within their scholarship major's (first major) limited credit hours, e.g., total of 124 (most programs) or 144 (CPEG/ELEG/STEG) required credit hours. Students are financially liable for any additional credit hours beyond those required for their first major.

DOUBLE MAJOR IN COMPUTER/SYSTEMS ENGINEERING

Students pursuing a double major in computer and systems engineering need to complete at least 164 credit hours to meet the requirements of both majors. Students can choose between the two capstone course sequences CPEG 475 and CPEG 480, or STEG 475 and STEG 480; however, the selected capstone project topic must be a cross of both majors. Six course electives (18 credit hours) and two lab electives (2 credit hours) must be selected, in consultation with the academic advisor, from 200-level or higher CPEG, ELEG, STEG, ENGR, and/or CSIS courses. The electives must be chosen according to the following rules:

1. At least two of the course electives must be CPEG courses.
2. At least two of the course electives must be STEG courses.
3. A maximum of one CSIS course elective.
4. One of the lab electives must be a CPEG lab.
5. One of the lab electives must be a STEG lab.
6. At least four of the course electives must be 300-level or higher courses.

The course electives are restricted to the following:

CPEG Electives:

CPEG 388, 389, 422, 430, 441, 450, 455, 460, 470

ELEG Electives:

ELEG 300, 305, 321, 323, 325, 389, 422, 450, 470, 472

STEG Electives:

STEG 388, 389, 422, 431, 446, 451, 452,465, 470

ENGR Electives:

ENGR 300, 389

CSIS Electives:

CSIS 230, 250, 255, 260, 300, 320, 370, 400, 401, 405, 415, 425, 440, 476

CPEG Lab Electives:

CPEG 201L, 303L, 331L, 350L

ELEG Lab Electives:

ELEG 301L, 323L, 421L

STEG Lab Electives:

STEG 220L, 340L

Students joining the double major option after completing a Capstone Course Sequence might need to take a second Capstone Course Sequence depending on their capstone project topic. In the case where a second Capstone Course Sequence is mandated for the student by the Department, four course electives (12 credit hours) and two lab electives (2 credit hours) must be selected in consultation with the academic advisor from 200-level or higher CPEG and STEG courses. The electives must be chosen according to the following rules and restricted to the lists provided above:

1. Two of the course electives must be CPEG courses.
2. Two of the course electives must be STEG courses.
3. One of the lab electives must be a CPEG lab.
4. One of the lab electives must be a STEG lab.
5. At least two of the course electives must be 300-level or higher courses.

Applications from students required to finish less than 144 credit hours for their computer/systems engineering degree (catalogs prior to AY 2014-15) to join the double major option or to have a second-degree (both AUK and non-AUK graduates) will be considered on a case-by-case basis and might be subject to additional requirements.

IMPORTANT: Scholarship students may not seek a double major unless the required credits for the second major fall within their scholarship major's (first major) limited credit hours, e.g., total of 124 (most programs) or 144 (CPEG/ELEG/STEG) required credit hours. Students are financially liable for any additional credit hours beyond those required for their first major.

DOUBLE MAJOR IN ELECTRICAL/SYSTEMS ENGINEERING

Students pursuing a double major in electrical and systems engineering need to complete at least 164 credit hours to meet the requirements of both majors. Students can choose between the two capstone course sequences ELEG 475 and ELEG 480, or STEG 475 and STEG 480; however, the selected capstone project topic must be a cross of both majors. Six course electives (18 credit hours) and two lab electives (2 credit hours) must be selected in consultation with the academic advisor from 200-level or higher CPEG, ELEG, STEG, and/or ENGR courses. The electives must be chosen according to the following rules:

1. At least two of the course electives must be ELEG courses.
2. At least two of the course electives must be STEG courses.
3. No CSIS course electives.
4. One of the lab electives must be an ELEG lab.
5. One of the lab electives must be a STEG lab.
6. At least four of the course electives must be 300-level or higher courses.

The course electives are restricted to the following:

CPEG Electives:

CPEG 305, 330, 340, 389, 390, 422, 430, 441, 450, 455, 460, 470

ELEG Electives:

ELEG 305, 311, 321, 323, 325, 331, 340, 388, 389, 411, 412, 422, 450, 470, 471, 472

STEG Electives:

STEG 388, 389, 422, 431, 446, 451, 452, 465, 470

ENGR Electives:

ENGR 300, 389

CPEG Lab Electives:

CPEG 201L, 221L, 303L, 330L, 331L, 340L, 350L

ELEG Lab Electives:

ELEG 301L, 323L, 331L, 421L, 471L

STEG Lab Electives:

STEG 220L, 340L

Students joining the double major option after completing a Capstone Course Sequence might need to take a second Capstone Course Sequence depending on their capstone project topic. In the case where a second Capstone Course Sequence is mandated for the student by the Department, four course electives (12 credit hours) and two lab electives (2 credit hours) must be selected in consultation with the academic advisor from 200-level or higher ELEG and STEG courses. The electives must be chosen according to the following rules and restricted to the lists provided above:

1. Two of the course electives must be ELEG courses.
2. Two of the course electives must be STEG courses.
3. One of the lab electives must be an ELEG lab.
4. One of the lab electives must be a STEG lab.
5. At least two of the course electives must be 300-level or higher courses.

Applications from students required to finish less than 144 credit hours for their electrical/systems engineering degree (catalogs prior to AY 2014-15) to join the double major option or to have a second-degree (both AUK and non-AUK graduates) will be considered on a case-by-case basis and might be subject to additional requirements.

IMPORTANT: Scholarship students may not seek a double major unless the required credits for the second major fall within their scholarship major's (first major) limited credit hours, e.g., total of 124 (most programs) or 144 (CPEG/ELEG/STEG) required credit hours. Students are financially liable for any additional credit hours beyond those required for their first major.

DEPARTMENT OF COMPUTING

Computers are everywhere in today's society. The infrastructures of so many elements of our everyday lives are increasingly dependent on computers and digital communication. Understanding the foundations of this technology and what it can do helps control and shape the processes of modern society.

The Department of Computing at AUK offers two bachelor's degree programs—Bachelor of Science in Computer Science and a Bachelor of Science in Information Systems. Both programs cover the principles of computing and keep the students well-informed on the latest developments in technology. Students of the Department of Computing not only gain a solid foundation in the theory and design of modern computing systems, but they are also given opportunities to test and apply their knowledge in lab assignments, in-class projects, and in a year-long senior capstone project. The program also offers two minors—a minor in computer science and a minor in information systems.

VISION

The vision of AUK's Department of Computing is to be a leading program in Kuwait and the region that offers high-quality undergraduate disciplines in the computing field.

MISSION

The mission of AUK's Department of Computing is to provide its students with a quality education based on computing fundamentals, entrepreneurship, and the Liberal Arts. The Department will prepare its graduates for successful careers in industry, government, and graduate studies, as well as lay the foundation for lifelong learning.

VALUES

The values that guide the Department of Computing at AUK are:

- **Teaching:** Academic excellence, learning, understanding and application.
- **Creativity**: Creative ideas and solutions in teaching, learning, research, and scholarship.
- **Service**: Service to the Department, the College, the University, the community, and the discipline.
- **Character**: Integrity, honesty, professionalism, accountability, and continuous self-improvement.

ADMISSION TO THE COMPUTER SCIENCE OR INFORMATION SYSTEMS PROGRAM

Admission to the computer science or information systems programs takes place upon the completion of MATH 110 with a university GPA of 2.0 or higher.

Transfer equivalencies from ABET accredited programs (**http://abet.org**) or equivalent will be considered. We also accept transfer from non-accredited programs for the courses that do not fall under the prefixes CSIS.

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

EDUCATIONAL OBJECTIVES

Program educational objectives are broad statements that describe the career and professional accomplishments that a program is preparing its graduates to achieve.

The CS program prepares students to:

1. Succeed in a computer science-related career by demonstrating leadership and ability to grow professionally in competence, and/or pursue and successfully complete advanced degrees.

2. Apply principles of computer science and industry computing practices to analyze, design, and implement computer-based solutions.

3. Communicate and work effectively with professionals from different areas of specialization.

4. Function ethically and responsibly in the profession and society.

STUDENT OUTCOMES

Graduates of the Bachelor of Science in Computer Science will have acquired the following abilities to:

1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.

2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

3. Communicate effectively in a variety of professional contexts.

4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

UNIVERSITY DEGREE REQUIREMENTS (124 CREDIT HOURS)

To earn a Bachelor of Science in Computer Science degree, students must complete at least 124 credit hours. Students are required to complete a minimum of 30 credit hours of upper-level courses (300-level or above) at AUK, of which at least 18 credits hours need to be taken in the major.

General Education Requirements composed of:		*(49)*
• Related field requirements applicable to Gen Ed requirements	(16)	
• Remaining Gen Ed requirements	(33)	
Related Field Requirements not applicable to Gen Ed		*(17)*
Major Requirements composed of:		*(58)*
• Computer Science Core	(49)	
• Computer Science Electives	(9)	

MAJOR REQUIREMENTS (58 CREDIT HOURS)

Computer Science Core Course Requirements (49 credit hours)

Students should earn a grade of "C-" or better in individual courses in the CS major. A cumulative major GPA of at least 2.00 in the major requirements is needed to earn an undergraduate degree in computer science.

CSIS 130	Computer Programming II	(4) [T]
CSIS 150	Professional and Ethical Issues in CSIS	(3)
CSIS 210	Data Structures and Algorithms	(3)
CSIS 220	Computer Architecture and Assembly Language	(3)
CSIS 250	Database Systems	(3)
CSIS 255	Web Technologies	(3)
CSIS 310	Introduction to Operating Systems	(3)
CSIS 320	Theory and Implementation of Programming Languages	(3)
CSIS 322	Computer Networks and Data Communication	(3)
CSIS 329	Introduction to Parallel and Distributed Computing	(3)
CSIS 330	Software Engineering	(3)
CSIS 401	Mobile Computing	(3)
CSIS 405	Analysis of Algorithms	(3)
CSIS 476	Computer Security and Information Assurance	(3)
CSIS 490	CSIS Capstone I	(3)
CSIS 491	CSIS Capstone II	(3)

Computer Science Elective Courses (9 credit hours)

Students must complete three CSIS courses (9 credit hours) with a grade of "C-" or better, selected in consultation with the academic advisor to fulfill the CSIS Electives requirement. Two courses must be 300 level or higher and the remaining course can be 200 level or higher. The three courses must be from CSIS.

RELATED FIELD REQUIREMENTS (33 CREDIT HOURS)

CS students are also expected to complete 33 credit hours of related field requirements, of which (16 credit hours) are applicable to Gen Ed. The passing grade in related field requirements is 2.0 "C". The related field requirement component is composed of CSIS, MATH, science, and business.

CSIS Requirements (4 credit hours)

CSIS 120	Computer Programming I	(4) [T]

Computer science and information systems majors do not need to take CSIS 101 to fulfill their general education requirements, as CSIS 120 will automatically fulfill that requirement.

*Math Requirements (15 credit hours)**

MATH 201	Calculus I	(3) [M]
MATH 213	Discrete Mathematics	(3) [M]
STAT 201	Statistics	(3)
MATH 203	Calculus II	(3)
Any other 200- or 300-level Math course		(3)

* **The total credit hours for the Math Requirements <u>MUST</u> be 15 credit hours.**

Science Requirements (8 credit hours)

BIOL 101	General Biology I	(3) [P]
BIOL 101L	General Biology I Laboratory	(1) [P]
	AND	
BIOL 102	General Biology II	(3) [P]
BIOL 102L	General Biology II Laboratory	(1) [P]
	OR	
PHYS 115	General Physics I	(3) [P]
PHYS 115L	General Physics I Laboratory	(1) [P]
	AND	
PHYS 116	General Physics II	(3) [P]
PHYS 116L	General Physics II Laboratory	(1) [P]

Business Requirements (6 credit hours)

MGMT 201	Principles of Management	(3)
ENTR 201	Principles of Entrepreneurship	(3)

BACHELOR OF SCIENCE IN INFORMATION SYSTEMS

PROGRAM EDUCATIONAL OBJECTIVES

The IS program prepares students to:

1. Apply the knowledge of the IS discipline to succeed in productive careers in information systems by demonstrating leadership and ability to grow professionally in competence, and/or pursue and successfully complete advanced degrees.

2. Apply the skills of the IS discipline which exhibit critical thinking, problem-solving, and teamwork to meet different stakeholders' objectives.

3. Communicate and work effectively with professionals from different areas of specialization.

4. Function ethically and responsibly in the profession and society.

STUDENT OUTCOMES

Graduates of the Bachelor of Science in Information Systems will have acquired the following abilities:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

3. Communicate effectively in a variety of professional contexts.

4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

6. Support the delivery, use, and management of information systems within an information systems environment.

UNIVERSITY DEGREE REQUIREMENTS (124 CREDIT HOURS)

To earn a Bachelor of Science in Information Systems, students must complete at least 124 credit hours. Students are required to complete a minimum of 30 credit hours of upper-level courses (300-level or above) at AUK, of which at least 18 credit hours need to be taken in the major.

General Education Requirements composed of:		*(49)*
• Related field requirements applicable to Gen Ed requirements	(16)	
• Remaining Gen Ed requirements (33)	(33)	
Related Field Requirements not applicable to Gen Ed		*(17)*
Major Requirements composed of:		*(58)*
• Information Systems Core	(49)	
• Information Systems Electives	(9)	

MAJOR REQUIREMENTS (58 CREDIT HOURS)

Information Systems Core Course Requirements (49 credit hours)

Students should earn a grade of "C-" or better in individual courses in the IS major. A cumulative major GPA of at least 2.00 in the major requirements (core, related field, and IS electives) is needed to earn an undergraduate degree in information systems.

CSIS 110	Foundations of Information Systems	(3)
CSIS 130	Computer Programming II	(4) [T]
CSIS 150	Professional and Ethical Issues in CSIS	(3)
CSIS 210	Data Structures and Algorithms	(3)
CSIS 230	Programming in a Second Language	(3)
CSIS 250	Database Systems	(3)
CSIS 255	Web Technologies	(3)
CSIS 260	Systems Analysis, Design, and Acquisition	(3)
CSIS 302	IT Infrastructure	(3)
CSIS 322	Computer Networks and Data Communication	(3)
CSIS 330	Software Engineering	(3)
CSIS 440	Software Project Management	(3)
CSIS 476	Computer Security and Information Assurance	(3)
CSIS 480	Business Process Management	(3)
CSIS 490	CSIS Capstone I	(3)
CSIS 491	CSIS Capstone II	(3)

Information Systems Elective Courses (9 credit hours)

Students complete three CSIS courses (9 credit hours), selected in consultation with the academic advisor, to fulfill their IS Electives. Two courses must be 300-level or higher and the remaining course can be 200-level or higher. All three courses must be from CSIS.

RELATED FIELD REQUIREMENTS (33 CREDIT HOURS)

IS students are also expected to complete 33 credit hours of related field requirements, of which 16 credit hours are applicable to Gen Ed. The related field requirement component is composed of CSIS, MATH, science, and business.

CSIS Requirements (4 credit hours)

CSIS 120	Computer Programming I	(4) [T]

Computer science and information systems majors do not need to take CSIS 101 to fulfill their general education requirements, as CSIS 120 will automatically fulfill that requirement.

Math Requirements (6 credit hours)

MATH 213	Discrete Mathematics	(3) [M]
STAT 201	Statistics	(3) [M]

Science Requirements (8 credit hours)

BIOL 101	General Biology I	(3) [P]
BIOL 101L	General Biology I Lab	(1) [P]
	AND	
BIOL 102	General Biology II	(3) [P]
BIOL 102L	General Biology II Lab	(1) [P]
	OR	
PHYS 115	General Physics I	(3) [P]
PHYS 115L	General Physics I Lab	(1) [P]
	AND	
PHYS 116	General Physics II	(3) [P]
PHYS 116L	General Physics II Lab	(1) [P]

Business Requirements (15 credit hours)

The following two courses are required for IS students:

MGMT 201	Principles of Management	(3)
ENTR 201	Principles of Entrepreneurship	(3)

Students are also required to choose ***ONE*** theme from the following coherent set options:

Option 1: Management

MGMT 301	Change Management	(3)
MGMT 315	Decision-Making in Management	(3)
ENTR 301	Intermediate Entrepreneurship	(3)

Option 2: Accounting

ACCT 201	Principles of Financial Accounting	(3)
ACCT 205	Managerial Accounting	(3)
ACCT 301	Intermediate Accounting I	(3)

Option 3: Finance

ACCT 201	Principles of Financial Accounting	(3)
FINC 332	Financial Management	(3)
FINC 343	Financial Services Management	(3)

Option 4: Marketing

ECON 200	Principles of Microeconomics	(3)
MRKT 200	Principles of Marketing	(3)
MRKT 309	Principles of E-Commerce	(3)

MINOR IN COMPUTER SCIENCE (18 CREDIT HOURS)

Students must take the following three core courses (9 credit hours):

CSIS 210	Data Structures and Algorithms	(3)
CSIS 310	Introduction to Operating Systems	(3)
CSIS 330	Software Engineering	(3)

And three additional courses (9 credit hours) from the following list of courses:

CSIS 320	Theory and Implementation of Programming Languages	(3)
CSIS 322	Computer Networks and Data Communication	(3)
CSIS 401	Mobile Computing	(3)
CSIS 405	Analysis of Algorithms	(3)
CSIS 476	Computer Security and Information Assurance	(3)

MINOR IN INFORMATION SYSTEMS (18 CREDIT HOURS)

Students must take the following three core courses (9 credit hours):

CSIS 110	Information Systems	(3)[T]
CSIS 210	Data Structures and Algorithms	(3)
CSIS 330	Software Engineering	(3)

And three additional courses (9 credit hours) from the following list of courses:

CSIS 302	IT Infrastructure	(3)

CSIS 322	Computer Networks and Data Communication	(3)
CSIS 401	Mobile Computing	(3)
CSIS 440	Software Project Management	(3)
CSIS 476	Computer Security and Information Assurance	(3)

DOUBLE MAJOR

For a double major in CS and IS, core electives are mutually exclusive.

- If choosing CS as the additional major, students must complete an additional 27 credit hours: 9 credit hours of MATH and 18 credit hours of core courses.
- If choosing IS as the additional major, students will need an additional 24 credit hours of core courses.

INTERNSHIP

Eligibility: A student with a departmental average of at least "B-" at the beginning of the junior or senior year may elect to pursue an internship course.

The internship is completed in the following stages:

1. Program Discussion: Potential interns (junior or senior majors) are advised on the nature and purpose of an internship. The essential point they learn is that there is a significant difference between the theory they learn in the classroom and the practice they will encounter during their internship.

2. Internship Contract Signed: The next stage is to have a meeting with the organization that has agreed to provide the internship. At this meeting, the nature of the internship is discussed, and the student, the off-campus supervisor, and the 470 course instructor all sign the form. At this meeting, special details of the internship are agreed upon in the format of a contract between the three parties.

3. Visit to Place of Work: At the time of the contract signing, or at a time near to this meeting, the 470 course instructor visits the place of work where the student is going to intern and checks that the environment is suitable and that the nature of the work and the place of work go together.

4. Contact Off-campus Supervisor: Contact is established between the off-campus supervisor and the 470 course instructor to ensure that if any problems arise during the internship, there is a clear understanding of the roles each party will play in making sure that the student has a quality learning experience.

5. Bi-monthly Progress Reports from Intern: During the period of the internship, interns are expected to email the 470 course instructor bi-monthly to report on progress and activity. Students are expected to record their activities so that in the future they can review what activities occupied their time while they participated in the internship.

6. Mid-term Assessment of the Intern: The midterm assessment of the intern is initially made based on the results of the bi-weekly progress reports. The off-campus supervisor will be consulted by the 470 course instructor before the midterm grade is posted.

7. Intern's Final Report*:* At the end of an intern's period of work, the intern is required to present a Report of Activity. This report is to record the activities that the student has completed. The program will provide a general template for the report. Students may add to the template. Once the report is submitted, it is reviewed by the 470 course instructor, and additions may be requested during an interview and discussion with the student.

8. Final Presentation: The student gives a public presentation to the program/division about his/her experience.

9. Final Assessment: The final assessment begins with a final assessment by the off-campus supervisor. This is submitted by the off-campus supervisor to the 470 course instructor. The 470 course instructor then confirms the off-campus supervisor assessment. After the student presents his/her findings, the 470 instructor submits the final grade of either Pass or No Pass.

Grade Distribution

• Bi-weekly progress reports	30%
• Work supervisor report	10%
• Final report	40%
• Final presentation	20%

Guidelines

1. The student is limited to a maximum of 6 credits hours of internship. A maximum of 3 credit hours (taken in increments of 1, 2 or 3 credits) may be applied to the major electives. An additional 3 credit hours of internship may be counted towards a second major, minor, or as free electives.

2. For the duration of the semester—16 weeks, students should work at least 2.5 hours per week (for 1 credit); 7.5 hours per week (for 3 credits); 10 hours per week (for 4 credits); and 15 hours per week (for 6 credits). A minimum of 120 hours is required for 3 credits, 80 hours for 2 credits, and 40 hours for 1 credit.

3. The Department of Computing sets the standards for the internship and reserves the right to decide on the suitability of the work experience.

4. The Department of Computing may assist students to find suitable employment.

5. Students are encouraged to find their own placements. However, the Department of Computing must be advised before a student approaches a prospective organization.

6. The 470 course instructor will visit the place of work where the student will be working to determine if the environment is suitable and that the nature of the work and place of work are in synergy.

7. Contact will be established between the 470 instructors and on-site supervisor to ensure that if any problems arise during the internship, there is a clear understanding of the roles each party will play to ensure that the student has a quality learning experience.

8. A placement is not secured until it has been approved by the 470 course instructor and department chair, and the student has signed and returned the Student Internship Agreement.

9. Students are required to meet with the 470 course instructor at least once a week to report on progress and activity.

Any student who is dismissed from his/her internship must notify the department chair and withdraw before the withdrawal deadline. Failure to do so within a reasonable amount of time will result in a failing grade.