



الكلية الأسترالية في الكويت
Australian College of Kuwait

Bachelor of Engineering Technology (Civil)

Units Description

Australian College of Kuwait

(Spring 2016 and onwards)

SEMESTER (1)				
ACK Unit Code	Intrn. Unit Code	Unit Name	Pre-Requisite	Credits
16SCVE310	ENEG11001	Engineering Skills* (PBL)	N/A	3
16SCVE311	ENTC12004	Civil Construction	N/A	3
16SMAT310	MATH11219	Engineering Mathematics	N/A	4
16SMAT311	PHYS11184	Engineering Physics A	N/A	4
SEMESTER (2)				
	Unit Code	Unit Name	Pre-Requisite	Credits
16SCVE320	ENEC13010	Solid Mechanics	16SMAT310	3
16SCVE321	ENEC13009	Hydraulics	16SMAT311	3
16SCVE322	ENEG12004	Engineering Design & Management Planning * (PBL)	16SCVE310	6
16SCVE323	ENEC12007	Analysis of Structures	16SMAT310	3
SUMMER SEMESTER (2)				
16SCVE333	New unit (optional)	Internship	16SCVE322	4
SEMESTER (3)				
	Unit Code	Unit Name	Pre-Requisite	Credits
16SCVE410	ENEG12006	Engineering Design & Management Implementation * (PBL)	16SCVE322	6
16SCVE411	ENTG13002	Technology Project Planning * (PBL)	16SCVE322 16SMAT311 16SMAT310	3
16SCVE412	ENEC14013	Concrete Structures	16SCVE323 16SCVE320 16SCVE311	3
16SCVE413	ENEC12008	Geotechnical Engineering	16SCVE321 16SCVE320 16SCVE311	3
SEMESTER (4)				
	Unit code	Unit name	Pre-requisite	Credits
16SCVE420	ENEC14015	Traffic Engineering	16SCVE320	3
16SCVE421	ENEC13013	Water Environmental Design * (PBL)	16SCVE322 16SCVE321	6
16SCVE422	ENTG13001	Technology Project Implementation * (PBL)	16SCVE411	3
16SCVE423	ENEC13011	Steel Structures	16SCVE323 16SCVE320 16SCVE311	3
TOTAL CREDITS				63

* **(PBL)** – Project Based Learning Unit

Bachelor of Engineering Technology (Civil)

SEMESTER (1)

1. 16SCVE310 Engineering Skills – PBL Unit

Prerequisites: None

Credits: 3 [3CH, 4 Lec, 2 TA]

Duration: 6 hours / week

Students are introduced to the role of professional engineers as mediators between the technical, business, social, cultural, environmental, economic and political contexts of engineering activities. They investigate and select materials and processes for engineering applications and justify decisions made. Students apply information literacy skills and information technology skills to engineering projects; they use drawing, modeling and simulation tools to analyze and present project outcomes; they apply risk assessment and workplace health and safety assessment to engineering activities; and they design, conduct and report on practical, hands-on activities. The learning is supported by compulsory class sessions. Students explore the complex nature of engineering activities and the need to deal with uncertainty and conflicting information, they prepare a portfolio to demonstrate development of a professional attitude, problem-solving skills, technical knowledge and productive work practices, and provide evidence of a professional capacity to communicate, work and learn productively, both individually and in teams.

2. 16SCVE311 Civil Construction

Prerequisites: None

Credits: 3 [3CH, 3 Lec]

Duration: 3 hours / week

Students are introduced to the roles of civil construction team members, use of typical project documents, application of Standards, acts and regulations and construction processes to civil earthworks, temporary works, substructure works and superstructure works for routine construction projects. Students conduct research, prepare reports and presentations and work independently and in teams in a professional manner.

3. 16SMAT311 Engineering Physics A

Prerequisites: None

Credits: 4 [4CH, 4 Lec, 2 Lab]

Duration: 6 hours / week

This course introduces the principles of engineering physics and aims to develop a fundamental understanding of several broad areas of physics (mechanics, fluids, wave properties, properties of matter and heat) applied to engineering and technology. The course provides practical experience in experimental and measurement techniques used to investigate these physical phenomena and develops related professional communication, information literacy and teamwork skills.

4. 16SMAT310 Engineering Mathematics

Prerequisites: None.

Credits: 4 [4CH, 4 Lec]

Duration: 4 hours / week

In this course students apply the essential calculus concepts, processes and techniques to develop mathematical models for engineering problems. They use the Fundamental Theorem of Calculus to illustrate the relationship between the derivative and the integral of a function and apply the theorem to engineering problems involving definite integrals. Differential calculus is used to construct mathematical models, which investigate a variety of rate of change and optimization problems. The standard rules and techniques of integration are included. Differential equations are introduced and applied to investigate more interesting problems in an engineering setting. Other important elements of this course are the communication of results, concepts and ideas using mathematics as a language, being able to document the solution to problems in a way that demonstrates a clear, logical and precise approach and communicating, working and learning in peer learning teams where appropriate.

SEMESTER (2)

5. 16SCVE320 Solid Mechanics

Prerequisites:

(16SMAT310) Engineering Mathematics

Credits: 3 [3CH, 3 Lec, 2 Lab]

Duration: 5 hours / week

Students will use the principles of engineering mechanics to analyze structural members subjected to torsion, bending and shear stresses. Principle stresses will be calculated for members subjected to combined stresses. The course outlines modes of failure including fatigue in engineering materials. Students use appropriate "civil engineering language" in context, document the process of modeling and analysis and present information, and communicate, work and learn, both individually and in teams in a professional manner.

6. 16SCVE321 Hydraulics

Prerequisites:

(16SMAT311) Engineering Physics A

Credits: 3 [3CH, 3 Lec, 2 Lab]

Duration: 5 hours / week

Hydraulics introduces the analysis of hydrostatic and buoyancy effects and analysis of flow pipe systems and in open channels. Students use knowledge of fundamental properties of fluids to analyze problems involving static and moving fluids. Students analyze and design pipe systems and networks, and open channels and related hydraulic structures. The course presents methods for calculating energy and surface profiles in open channel flow, the operation and selection of pumps and turbines, and the use of similitude principles for modeling hydraulic effects. It requires students to learn to work autonomously and emphasizes the importance of clear, professional documentation of the approach taken in analysis of hydraulics problems.

7. 16SCVE322 Engineering Design and Management Planning – PBL Unit

Prerequisites:

(16SCVE310) Engineering Skills

Credits: 6 [6CH, 4 Lec, 2 TA]

Duration: 6 hours / week

In this course students should be able to apply project management techniques to conceptual design of engineering projects. They reflect on project activities and develop and describe their personal framework for engineering design and project management. Students produce a conceptual design and project specifications aligned with relevant Standards and current engineering practice given a loosely formed

client brief. They describe and explain the conduct and management of engineering enterprises and of the structure and capabilities of the engineering workforce, and they demonstrate and justify the incorporation of a systems approach to design activities based on a broad sustainability framework. Students identify, justify and apply the technical knowledge and skills required to successfully complete an engineering project, and produce professional and technically competent project management and design documentation. Students prepare a portfolio to demonstrate development of a professional attitude, problem-solving skills, technical knowledge and productive work practices, and they provide evidence of a professional capacity to communicate, work and learn productively, both individually and in teams. The learning is supported by compulsory class sessions.

8. 16SCVE323 Analysis of Structure

Prerequisites:

(16SMAT310) Engineering Mathematics

Credits: 3 [3CH, 3 Lec, 2 Lab]

Duration: 5 hours / week

In this course students analyze the determinacy and stability and the implications this has for structural analysis. They determine reactions, internal forces and displacements of structures, and analyze beams with moving loads, using analysis software and approximate methods of analysis. Students use appropriate “civil engineering language” in context, document the process of modeling and analysis and present information, and communicate, work and learn, both individually and in teams in a professional manner.

9. (151CVE414) Internship

Prerequisites:

(16SCVE322) Engineering Design and Management Planning

Credits: 4

Duration: 1 hour / week (meeting with academic supervisor)

This course covers the professional experience, through training in the execution of real life engineering projects. Practical training aims at developing practical skills for the student so that he/she might develop an awareness of job requirements and become qualified to practice a specialization in a sound and systematic way. It might also help a student to find or locate later job opportunities at the same training site if he/she is able to demonstrate competence and obtain the satisfaction of the Field Supervisor and those responsible at the site.

SEMESTER (3)

10. 16SCVE410 Engineering Design and Management Implementation – PBL Unit

Prerequisites:

(16SCVE322) Engineering Design and Management Planning

Credits: 6 [6CH, 4 Lec, 2 TA]

Duration: 6 hours / week

In this course students should be able to apply project management techniques to conceptual design of engineering projects. They reflect on project activities and continue to develop and describe their personal framework for engineering design and project management. Students design or select components and elements required for a project and develop a detailed project design consistent with relevant standards and current engineering practice given a conceptual design and client approved project specifications. They model and evaluate the detailed design and demonstrate and justify the incorporation of a systems approach to design activities based on a broad sustainability framework. The learning is supported by compulsory class sessions.

11. 16SCVE411 Technology Project Planning – PBL Unit

Prerequisites:

(16SMAT311) Engineering Physics A

(16SMAT310) Engineering Mathematics

(16SCVE322) Engineering Design and Management Planning

Credits: 3

Duration: 2 hours / week

Students in the final year of their Bachelor of Engineering Technology program work independently to find and plan a project that allows them to demonstrate professional capabilities expected of graduating engineering technologists. Formal and informal project reporting articulates the analysis of project planning issues and critical thinking behind project choices and decisions made. Students report to and work with guidance from a supervisor to scope and define the project, undertake research into project issues, incorporate safety and risk issues, produce a plan and schedule for implementation of the project in the subsequent project implementation course, and produce informal and formal projects reports and presentations.

12. 16SCVE412 Concrete Structure

Prerequisites:

(16SCVE320) Solid Mechanics

(16SCVE323) Analysis of Structure

(16SCVE311) Civil Construction

Credits: 3 [3CH, 3 Lec, 2 Lab]

Duration: 5 hours / week

This course introduces the principles and practices of design of concrete structures conforming to the American Concrete Institute (ACI). Structural systems and load paths for gravity and lateral loading are identified and determined and state-of-the-art construction materials are reviewed in the context of sustainability and environmental issues. Students interpret and apply Standards to design concrete structural components such as beams, slabs, columns, footings and retaining walls. They plan and prepare tests and carry out tests on structural concrete components, interpret results and prepare test reports. The social and cultural context of concrete building design and serviceability requirements are integrated in the design process through individual /team work that focuses on development of professionalism, ethical practice, problem solving and communication.

13. 16SCVE413 Geotechnical Engineering

Prerequisites:

(16SCVE321) Hydraulics

(16SCVE320) Solid Mechanics

(16SCVE311) Civil Construction

Credits: 3 [3CH, 3 Lec, 2 Lab]

Duration: 5 hours / week

The course presents geological processes that produce landforms and geological structures, rocks and soils, and introduces the effect of geological factors on the location, design, construction and maintenance of civil engineering projects. Students conduct geotechnical tests, analyze test data, prepare geotechnical reports, discuss the engineering characteristics and properties of soil. They select appropriate approaches for analyzing behavior of soils in response to engineering applications. They will use appropriate "civil engineering language" in context; document the process of modeling and analysis of soils. Students present information in a professional manner and communicate, work and learn, both individually and in teams.

SEMESTER (4)

14. 16SCVE420 Traffic Engineering

Prerequisites:

(16SCVE320) Solid Mechanics

Credits: 3 [3CH, 3 Lec, 2 Lab]

Duration: 5 hours / week

Students describe and explain the fundamental concepts and characteristics of traffic engineering systems. They analyze traffic survey data and interpret survey results, applying them to analysis of traffic flows and estimation of system capacity. Students analyze and design intersections, roundabouts and signalized intersections, assess traffic environments, develop strategies for managing and controlling traffic, identify safety issues and recommend solutions. They are required to communicate, work and learn, both independently and collaboratively, in a professional manner.

15. 16SCVE421 Water & Environmental Design – PBL Unit

Prerequisites:

(16SCVE321) Hydraulics

(16SCVE322) Engineering Design and Management Planning

Credits: 6 [6CH, 4 Lec, 2 TA]

Duration: 6 hours / week

Students undertake projects in water and environmental design, deliver project reports, and develop skills to communicate, work and learn professionally. They analyse catchments to determine urban and rural stormwater flows, flooding and water yield for storage. Based on these analyses, students design stormwater drainage systems and system components. They apply groundwater hydrology principles to analyse well tests and determine aquifer characteristics. They study the impact of human activity and the responsibilities of civil engineers in relation to ecosystem sustainability. Students select standards and tests for monitoring and controlling pollution and describe processes used to manage domestic and industrial wastes.

16. 16SCVE422 Technology Project Implementation – PBL Unit

Prerequisites:

(16SCVE411) Technology Project Planning

Credits: 3

Duration: 2 hours / week

The purpose of this course is to provide students who are in the final year of their program with an opportunity to carry out an authentic work assignment type project, which closely approximates

technologist's activities in industry. It is expected that while carrying out the project, students will develop their expertise as well as practice skills in the project's discipline are.

17. 16SCVE423 Steel Structures

Prerequisites:

(16SCVE320) Solid Mechanics
 (16SCVE323) Analysis of Structures
 (16SCVE311) Civil Construction

Credits: 3 [3CH, 3 Lec, 2 Lab]

Duration: 5 hours / week

This course introduces Standard design methodology for major steel structural components. Basic material and section properties and factors affecting the properties of structural members are introduced. Students design steel members and connections for axial loads, bending, torsion and combined actions and explain the design processes they use. They develop skills in use of the technical language of structural steel design and in the documentation and checking of designs. Students work, learn and communicate in a professional manner, alone and in teams, and use information literacy skills to investigate design problems and present solutions.

