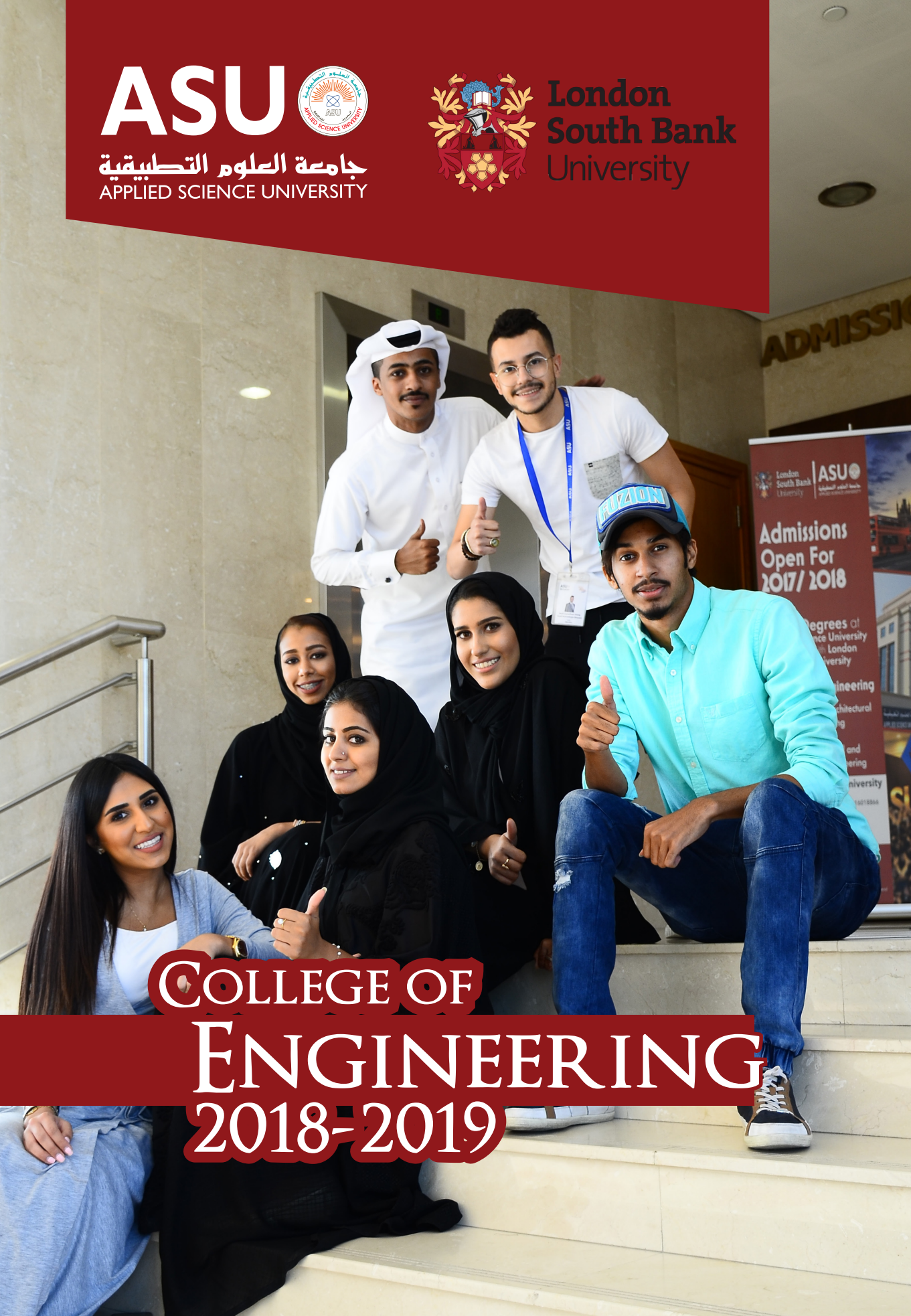
ASU
جامعة العلوم التطبيقية
APPLIED SCIENCE UNIVERSITY

London South Bank University



College of Engineering

2018-2019

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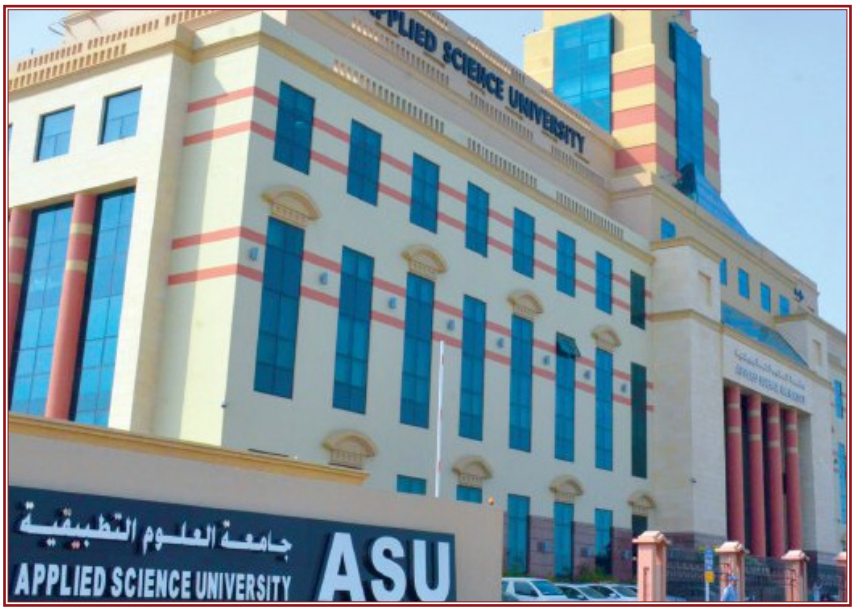
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APPLIED SCIENCE UNIVERSITY
ASU


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University

Message from the Dean

Welcome to the College of Engineering at the Applied Science University. A college that is unique in its culture, facilities and environment. Our programmes are distinct as they offer you the chance to study an internationally recognised UK degree course here in Bahrain, with work experience and internship opportunities. Upon successfully completing the programme, you will be awarded a degree from London South Bank University in the UK. This will give you a competitive advantage in the job market, wherever your career takes you and will allow you to develop lifelong learning skills that are sought after by employers here in Bahrain and also internationally.

The College will offer five Bachelor degree programmes in Engineering. Two programmes started in September 2017 and we welcome applications from outstanding students for:

- B. Eng. (Hons) Civil and Construction Engineering
- B. Eng. (Hons) Architectural Design Engineering

The B. Eng. (Hons) Electronics and Electrical Engineering, B. Eng. (Hons) Telecommunications and Networks Engineering and the B. Eng. (Hons) Mechanical and Design Engineering progarmmes will be launched in September 2019.

We strongly believe that the future for engineers is incredibly bright and the College of Engineering will provide you with excellent career opportunities. Engineering and technology will continue to fuel the pace of change, offering unimaginable options for those with imaginative, creative and open minds.

Welcome once again to the exciting world of engineering.

Dean: The College of Engineering

General Information

Awarding Institution	London South Bank University, UK
Teaching Institution	Applied Science University, Kingdom of Bahrain
College	Engineering
Department	Civil and Architectural Engineering
Offered programmes	B Eng (Hons) Architectural Design Engineering
	B Eng (Hons) Civil and Construction Engineering
Programmes licenced by	Ministry of Education, Kingdom of Bahrain
Final Qualification	Bachelor Degree
Academic year	2017-2018
Language of study	English
Mode of study	Full-Time
Duration of each programme	4 years
Faculty members	
Acting Dean, College of Engineering	**Professor Zaher Kuhail** Professor of Civil Engineering Room 108, Ext. 273, Email: zaher.kuhail@asu.edu.bh
Head of Department	**Dr Islam Abo-Hela** BSc, MSc, PgCert, PhD Assistant Professor in Architectural Engineering Room 111, Ext.310 Email:islam.abohela@asu.edu.bh
Programmes coordinator	Architectural Design Engineering **Dr Mohamed Mahgoub** BSc.MSc. MBA,PhD Assistant Professor in Architecture Room 112,Ext.348 Email mohamed.mahgoub@asu.edu.bh

Programmes coordinator	Civil and Construction Engineering **Professor Zaher Kuhail** Professor of Civil Engineering Room 108, Ext. 273, Email: zaher.kuhail@asu.edu.bh
	Dr Assem Al-Hajj B.Eng , MSc, PhD, PgCert, SF-HEA, MLSEA, MMEFMA, FAIQS, FCIOB Vice President for Academic Affairs and Development Associate Professor in Civil and Construction Engineering Room 602, Ext.255 Email: assem.Al-Hajj@asu.edu.bh
	Dr Raad Kadhum BSc, MSc, PhD Assistant Professor in Civil and Construction Engineering Room 110, Ext. 202 Email:raad.kadhum@asu.edu.bh
	Mr Yoonusraj Kodakkadan BSc,MSc Lecturer Room B03, Ext.346 Email:yoonusraj.kodakkadan@asu.edu.bh
Office Administrators	**Noor Mohamed Ali Abdulla** Room 106, Ext.274 Email: noor.abdulla@asu.edu.bh

Vision

The vision of Applied Science University is to be one of the leading private universities supporting practical learning and research in Bahrain and the Gulf.

Mission

ASU is committed to offering an education that is accessible to academically competent students of Bahrain, the Gulf and beyond, and to deliver academic programmes of quality that graduate students equipped with knowledge and skills relevant locally and regionally. ASU is further dedicated to the promotion of a culture of learning and scientific research for its students, staff and faculty regionally and globally to engage meaningfully with the community at large".

Values

- **Integrity:** ASU's community values honesty, fairness and academic integrity as fundamental to its vision and mission, and will recognize, affirm and uphold this value in a responsible and committed manner.
- **Collaboration and Team Spirit:** ASU's community recognizes collaboration and team spirit to be at the heart of the institutional culture and will promote these values in a dedicated manner.
- **Loyalty:** ASU's students, faculty and staff cherish loyalty and commitment and recognize these values to be inherent in their culture of cooperation and dedication.
- **Social Responsiveness and Community Engagement:** ASU's students, faculty and staff value their partners, networks and communities and intend to engage with them, in a thoughtful, respectful, responsible and meaningful manner.
- **Quality:** ASU's community values, quality as an ideal and standard that should characterize its processes, outcomes, people and partners.

Rationale

The two offered courses in the department prepare students for a career as engineers. The courses embrace recent industry developments, in particular, the inclusion of the ECUK UK Standard for Professional Engineering Competence (UK-SPEC), and gives students the opportunity to achieve the professional status of Chartered Engineer.

The curriculum emphasises the development of traditional engineering numerical strengths coupled with an enquiring creative approach as required by employers. Developing the latter approach is sometimes difficult but it is our aim to get students to eventually approach with relish a blank sheet of paper and an ill-defined, uncertain brief to which they can develop a rational solution. The principles of Building Information Modelling are studied in a thread of modules and applied in group projects. We do seek to educate, rather than to merely train.

Because both civil and architectural engineering are such broad areas, there are many different specialisms for students to consider after graduating, but our degree will give students a solid foundation to enter any of them.

Philosophy of the curriculum

The central theme of the programmes is developed around the broad concept of "engineering - design and construction". This is achieved by structuring the programmes around two main strands, namely Engineering Analysis and Engineering Design.

Engineering Analysis Units

This strand of the course develops the fundamental knowledge of engineering, considering the physics of the problems, the theoretical underpinning and problem-solving techniques.

Engineering Design Units

The design capability is developed as a generic capability underpinned by engineering analysis with the objective of developing Civil and Architectural Engineers who approach design problems creatively and who have the technical skills to see ideas through to realisation.

Complementary Units

These units further enhance the quality of the Civil and Architectural Engineer by providing general and specialist skills in a range of appropriate computer software and IT packages including CAD and BIM packages.

Project Module

The final year Project Module is an individual submission of an investigation into a specific area of the programme studied, providing the student with the opportunity of pursuing a programme of independent study. The work is expected to be of an investigative nature having an experimental, analytical or fieldwork input.

Laboratory and Studio Work

This is a major aspect of the course. Practical work will be contained within a particular module but will be designed to relate the module subject to others in the course to provide a holistic approach.

Field Trips and Site Visits

Some modules include field work and site visits, which may be residential or outside the Kingdom of Bahrain. One-day visits to construction sites and other installations are arranged on a regular basis.

Modes of Study

Both programmes are offered on full-time bases requiring the completion of a foundation year in addition to three years of academic study, taught over 8 semesters and a summer semester.

- Minimum Study Period : 4 years
- Maximum Study Period : 8 years
- Total Credit Hours : 150 Credit Hours
- No. of Courses : 50 Courses
- Credit Hour per Course : 3 credit hours

Programmes Management

The two programmes are hosted in the College of Engineering through the Department of Civil and Architectural Engineering. The Department is under the immediate administrative control of a Head of Department.

Academic Advisor

The academic advisor acts as the Personal Tutor providing advice and assistance on a wide range of academic, financial, and personal matters and, if counselling needs arise, will refer students to the University's Student Affairs Unit or other associated services. Students are encouraged to formally see their academic advisors at least once per semester, with a formal appointment.

Module Leader

Each module has a Module Leader who is responsible for:

- The allocation of teaching duties including tutorials, seminars, and practical work within the module.
- Preparing and issuing teaching and coursework schedules.
- Preparing and distributing the module guide.
- Organising the preparation and checking of examination papers.
- Collating coursework, examination, and module marks.
- Attending course boards and examination boards in that capacity.
- Revising and updating the module content.

Timetables – Moodle

Students are strongly advised to frequently refer to Moodle for class and examination timetables, and room allocation during the academic year.

ASU e-mail address

Electronic communications, between staff and students, will be via the student's ASU e-mail address. Students are strongly advised to check their ASU e-mail regularly.

Assessment

Assessment Rationale

Throughout the course, assessments will be used to establish that students can understand and apply principles, but the overall aim will be to ensure that the eventual graduates can analyse, synthesise and creatively apply what they have learnt and hence are prepared to become imaginative and thinking individuals.

As the course progresses the assessments will become more intellectually demanding. Students will be encouraged to develop and display strong communication skills in various mediums such as written reports, verbal presentations, videos, drawing, and computer outputs. They will be encouraged to take an academic approach to their work with well-supported arguments, good referencing and relevant bibliographies.

Some assignments will demand group work as the ability to work positively as part of a team is essential in the civil and architectural engineering. In some instances assessment will be on the individual's performance as part of a team and in other cases a mark for the group's effort will be shared equally by the members of the team.

Assessment Regulations

Relevant regulations are reproduced from current academic regulations for taught programmes (and is available on the Moodle link). These may be subject to change. Please refer to the module leader for any changes.

Assessment Methods

A module may be assessed either by a combination of examination and coursework or by continuous progressive assessment.

In the coursework and continuous assessment elements, assessment may be a combination of coursework assignments, individual or group projects, and open book or closed book tests and examinations.

Assessment Weighting

Where assessment is by a combination of Examination and Coursework, the weighting of each component of assessment is shown in the Course Structure table in this document.

The Module pass mark is 50% (converted from the LSBU pass marks of 40%)

In the case of a continuously assessed module, marks are awarded for specified assignments set during the course module. The module mark is equal to the actual percentage mark obtained through the summation of all the assignment marks. In some modules, students may have to achieve a minimum requirement in individual coursework components.

Condonement

The Examination Board has the discretion to condone the failed module(s), only in the case of approved extenuating circumstances, and evidence of having met the learning outcomes for the module. The Module mark remains unchanged and the result is recorded as a Pass after Condonement.

Coursework Deadlines

A student who is unable to submit a completed coursework assignment by the specified deadline must formally notify the Module Leader. The student should then submit the work, completed or incomplete, no more than two weeks later than the deadline date.

The student may make a claim for extenuating circumstances. If this claim is supported, no capping of marks will be applied to a completed assignment. Where the work as submitted is incomplete the Award and Progression Examination Board may grant a deferral and allow the student to submit for an uncapped mark at the next scheduled assessment point.

If the claim for extenuating circumstances is not accepted, the work as submitted will be marked on its merits; if the merited mark is above the pass mark it will be capped at the

pass mark (50%). If the merited mark is below the pass mark, the Award and Progression Examination Board may award a compensated pass, if eligible, or allow the student to be referred in the assessment.

If there is no submission of the assignment within two weeks of the deadline, a mark of zero will be recorded. In such a case the Award and Progression Examination Board will not permit the student to be referred in the assignment.

Extenuating Circumstances Claim

A student who believes circumstances outside his/her control have affected his/her performance in the assessment of a Module during the academic year, and he/she wishes this to be taken into account by the Examination Board, then he/she MUST complete the form, together with all the appropriate documentary evidence, for consideration by the Extenuating Circumstances Board. The Extenuating Circumstances Board will then decide whether to support or reject the extenuating circumstances claim.

The Extenuating Circumstances Form is available from the College Office. The completed form must be handed in to the College Office by the appropriate deadlines.

Calculators

Only calculators approved by the Department will be allowed in the Examination rooms. These are normally noiseless, cordless, not pre-programmed and cannot receive/transmit data remotely. The recommended model is of the type CASIO fx-85WA, or equivalent.

Academic Misconduct

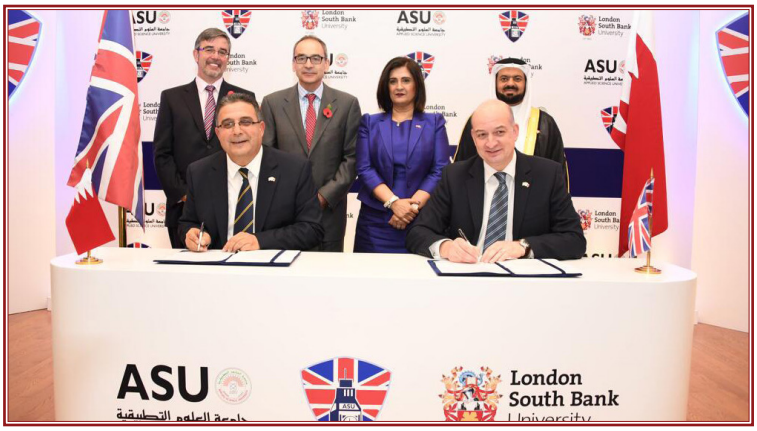
Where there are suspected cases of academic misconduct, like cheating, plagiarism or other forms of unfair advantage, the details of the incident will be brought to the attention of the College Students' Disciplinary Committee, and the University, for any penalty to be imposed.

Resources

Academic and Staff Support

Academic input to the programmes will come from:

- The permanent staff of the College and Department.
- The part-time staff of the College and Department.
- Visiting specialists.



The course management and the academic input is undertaken from within the College. The staff through research, consultancy, staff development and professional experience are fully up to date and at the forefront of their respective disciplines. This expertise is conveyed to students through the series of lectures, tutorials and seminars. Visiting specialist lecturers who are experts in the various fields of professional practice make regular contributions to the lecture programme of several modules in addition to participating in the assessment of seminars and group project work.

Facilities Generally

The Department will be using the University and College lecture and seminar rooms for most of the teaching.

Laboratories and Studios

The programmes will make use of laboratory and Studios facilities provided by the College in the areas of structures; concrete; materials; hydraulics; geology, soil mechanics and design. Technician support is provided in each of these areas.

Library

All students will be registered to use the e-library and the library on campus. As student centred learning becomes increasing important it is expected that students will make greater use of the library facilities.

Computer Facilities

Students will have open access to well-equipped computer laboratories and will experience a range of hardware and software as tools to assist effective communication. Each student will be allocated a unique username giving access to the university network and to the Internet.

Equal Opportunities

We are strongly committed to equality of opportunity both as an employer and as an educational institution. In implementing this commitment, the University aims to ensure that no applicant for a job or a course receives less favourable treatment on the grounds of gender, age, race, colour, nationality, ethnic or national origin, marital status, home responsibility, disability, and trade union activity, political or religious belief. The University aims to ensure the promotion of good relations among its staff and students and will create conditions that contribute to the full development and potential of all its members. The university will establish and maintain close links with the local community and will seek to extend employment and educational opportunities for local people, with special concern for the needs of women and members of ethnic minority groups. The University seeks to provide a suitable environment for working and studying for people with disabilities.

Student Responsibilities

Please refer to the students' handbook.

Enrolment and Re-enrolment

Students must enrol and/or re-enrol at the beginning of each academic year in accordance with University procedures.

Change of Address

Students who change their permanent or term time address must report the change promptly to the Registration Office, using the relevant form. The University is not liable for any correspondence that is misdirected as result of the student's failure to do so.

Interruption/Withdrawal

Students who wish to interrupt or withdraw from their studies must inform the Deanship of Admission and Registration using the relevant form.

Programme Team-Student Communication

It is the programme team policy that any electronic communication will be via the student's ASU e-mail address, and not their private email accounts. It is the responsibility of the student to check their ASU mails regularly.

The programme team is not liable for any consequences as a result of the student's failure to check their ASU e-mails regularly.

My ASU Web-Link

The ASU website has a very useful My ASU quick link which accesses most of the information, forms and publications, related directly to the student's duration of study at ASU.

Moodle

Via My-ASU, Moodle can be accessed. Programmes and module(s) materials will be uploaded and students must access this site regularly, in order to stay updated with all aspects of programme/module administration, submissions and any other related information.

List of Programmes

Extended Degree (Foundation Year)

B.Eng (Hons) Civil and Construction Engineering

B.Eng (Hons) Architectural Design Engineering

Extended Degree (Foundation Year)

Study Plan

Year 1

First Semester (Level 3/S)				
Module Code	**Modules**	**Pre-requi-sites**	**Credit Hours (ASU)**	**Credits (LSBU)**
MATH301	Mathematics 1	School Level	3	10
BENG311	Engineering Science 1	-	3	10
ENGL301	Intermediate English	-	3	10
BENG300	Principles of Engineering	-	3	10
BENG302	Laboratory and Workshop Skills	-	3	10
Total			**15**	**50**

Semester 2 (Level 3)				
Module Code	**Modules**	**Pre-requi-sites**	**Credit Hours (ASU)**	**Credits (LSBU)**
MATH302	Mathematics 2	MATH301	3	10
ENGL302	Advanced English	ENGL301	3	10
BENG 312	Engineering Science 2	-	3	10
BENG301	Constructing the Built Environment	-	3	10
SKPP300	Study Skills and Professional Practice	-	3	10
CSE300	Computer Programming for Engineering	-	3	10
Total			**18**	**60**

Summer Semester (Level 3)/ Compulsory				
Module Code	Modules	Pre-requi-sites	Credit Hours (ASU)	Credits (LSBU)
HRL300	Human Rights	-	3	10
HIST300	Bahrain Civilization and History	-	3	10
ARAB301	Arabic Language	-	3	10
ARAB300	Arabic Language for Non-Arabic Speaking	-		10
Total			**9**	**30**

Extended Degree (Foundation Year)

Modules Brief Descriptions

MATH 302- Mathematics 1

The module is designed to provide students with the mathematical knowledge and skills to support the study of engineering and to provide the requirement for entry into the B.Eng courses at ASU. It is, therefore, a preparatory or foundation module building on the knowledge obtained at school.

MATH 301 Mathematics 2

The module is designed to provide students with the mathematical knowledge and skills necessary for transition to level 4 study of engineering subjects. Students will attend lectures and tutorial where worked exercises are undertaken. Where possible, the statistical content will introduce the use of statistical packages and the presentation of real-life data sets. All students will keep a logbook of the problems tackled.

BENG 311 Engineering Science 1

This module covers scientific principles of physics and chemistry at a level between secondary school level and Advanced Level. It serves as a preparatory module for students intending to undertake engineering undergraduate degree courses in the University and introduces students to a range of skills required for the study of engineering.

BENG 312 Engineering Science 2

This module is aimed at extending the science knowledge of engineering students in preparation for continuing their respective engineering degree. It covers general applied physical principles, including dynamics, statics, fluids, heat and energy.

SKPP 300 Study Skills and Professional Practice

This module provides an introduction to both study and professional skills and practice. The module introduces study skills considering both individual and team-working skills. It covers exam preparation, revision and question answering techniques. It introduces students to their own personal development planning processes.

It also enables students to develop and use appropriate safe working practices as will be expected in an engineering and industrial environment.

BENG 302 Laboratory and Workshop Skills

This module is a mixture of workshop exercises and practical experiments and projects. Students work in small groups of 2-5 people depending on the task. The module also provides students with an introduction to design skills and basic engineering drawing.

BENG 301 Constructing the Built Environment

This module introduces students to design principles and processes specific to constructing the built environment. It will explore traditional and modern construction methods and understand how new methods and materials can sustain the built environment.

BENG 300 Principles of Engineering

The course develops the students' understanding of essential scientific principles for the study of engineering to degree level. It is designed to be accessible to students with a wide range of prior science specialisation. The course comprises two blocks of study. These blocks are common to all engineering disciplines and introduce the principles of measurement systems and units, thermal physics, mechanical and electrical principles, and engineering materials and their properties.

ENGL 301 Intermediate English

The course provides intensive practice in English including reading, oral presentations, writing, and note-taking. Academic and study skills are embedded in the course. The course develops students' English language and analytical skills in order to pursue a more advanced ASU academic English course and to cope with the literacy demands of specialised courses taught in English.

ENGL 302 Advanced English

The course provides intensive practice in advanced level reading, oral presentations, writing, and note-taking. Academic and study skills are embedded in the course. This course aims to enhance students' English and analytical skills as a prerequisite for academic and professional success.

CSE 300 Computer Programming for Engineering

This course introduces students to concepts of programming. This includes conditional,

iterations and block structure. Structure programming and data-types will also be introduced and illustrated with typical and simple engineering problems.

HIST 300 Bahrain Civilization and History

The aim of the module is to highlights the role of the Kingdom of Bahrain in its local, regional and international levels, through various historical eras, beginning with the Old Ages through the Islamic era, to the modern era. The module demonstrates the Arab and Islamic identity of the Kingdom of Bahrain, and the vital role it played politically and culturally.

HRL 300 Human Rights

This course deals with the basic principles of human rights in terms of the definition of human rights and its scope and source, focusing on the provisions of the international law of human rights, which include the following international documents:

a- Charter of the United Nations

b- The Universal Declaration of Human Rights

c- The International Covenant on Civil and Political Rights

d- The International Covenant on Economic, Social and Cultural Rights

e- Convention against Torture and Cruel, Inhumane Punishments.

f- Protection Mechanisms and Constitutional Organisation of Public Rights and

g- Freedom in the Kingdom of Bahrain.

ARAB 301 Arabic Language

The module provides intensive practice in Arabic at upper intermediate reading, oral presentations, writing, and note-taking.

ARAB 300 Arabic Language for Non-Arabic Speakers

The module provides intensive practice for beginners in Arabic including reading, oral presentations, writing, and note-taking.

B.Eng. (Hons) Architectural Design Engineering

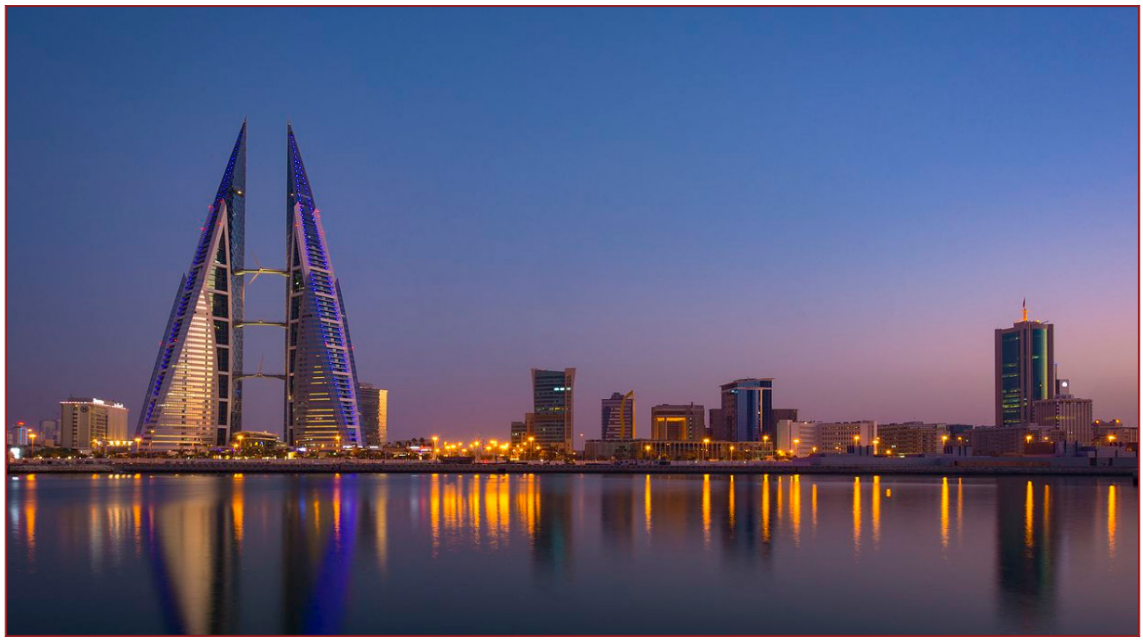
Aims and objectives

The B.Eng. (Hons) in Architectural Design Engineering aims to:

- Develop students' core, personal and employability skills, to help them adapt to the changing labour market.
- Utilise the variety of construction professions, to expose students to a multitude of aspects of the construction process, and prepare them for work in multidisciplinary teams.
- Give students a blend of architecture and civil engineering courses, exploring the form and appearance of buildings, as well as their analysis, design and construction.
- Produce graduates with knowledge, problem-solving skills and practical know-how of the key aspects of architectural and civil engineering, and the creativity and individuality of architecture.
- Produce graduates aware of the whole design process, including design procedures in codes of practice, architectural engineering procedures, project management, quality issues, finance, ethical conduct, environmental issues and health and safety.
- Produce graduates who can work in multidisciplinary desig

n practices and provide a link between engineering and architecture professionals.

Provide graduates with the necessary academic qualifications which will provide the full educational base for a successful career in the industry.



Source: Bahrain World Trade Centre, URL: https://en.wikipedia.org/wiki/Bahrain_World_Trade_Center,Ja. 2018

Difference between Architecture and Architectural Engineering

	Architecture	Architectural Engineering
What's it all about?	Design, and how this fits within the broader context of society.	Engineering aspects of buildings - their structural systems.
Who is the course for?	Creative people with strong art and design skills who are interested specifically in the building.	Mathematically-minded and scientific people who are interested in building physics, the construction process, and design.
What will I study?	Design and making skills, History of architecture, Architectural theory, Structures, Materials, Sustainability, Ethics and Communication skills	Architectural sustainable building design and technology, Building Information Modelling (BIM), 3D Computer Aided Design and visualisation, Structural building analysis, Calculus, Building physics and Thermodynamics
What careers are open to me?	Architectural Assistant, or Architect	Architectural Engineer
What does the job involve?	Working with a client to translate their vision into a design. This could be at the principle design stage or produce detailed construction drawings.	Carrying out design, testing, analysis, and implementation of building structures, as well as analysis of what is under a building, to meet regulations and the demands of the design. They use specialist skills such as building information modelling.

B.Eng (Hons) Architectural Design Engineering

Study plan

Year 2

Semester 1 (Level 4)				
Module Code	**Modules**	**Pre-requi-sites**	**Credit Hours (ASU)**	**Credits (LSBU)**
ARC431	Architectural Engineering Design and Structures 1	-	3	10
ARC433	Engineering Practice and Design 1	-	3	10
ARC411	Engineering Mathematics 1	-	3	10
ARC413	Principles of Engineering Science 1	-	3	10
ARC461	CAD Graphics	-	3	10
ARC435	Integrated Design and Construction	-	3	10
Total			**18**	**60**

Semester 2 (Level 4)				
Module Code	**Modules**	**Pre-requi-sites**	**Credit Hours (ASU)**	**Credits (LSBU)**
ARC432	Architectural Engineering Design and Structures 2	-	3	10
ARC434	Engineering Practice and Design 2	-	3	10
ARC412	Engineering Mathematics 2	ARC 411	3	10
ARC414	Principles of Engineering Science 2	ARC 413	3	10
ARC436	Building Technology	-	3	10
ARC462	Building Environment Simulation and Analysis	-	3	10
Total			**18**	**60**

Year 3

Semester 1 (Level 5)				
Module Code	**Modules**	**Pre-requi-sites**	**Credit Hours (ASU)**	**Credits (LSBU)**
ARC541	Structural Design 1	-	3	10
ARC511	Advanced Engineering Mathematics	ARC412	3	10
ARC551	Geotechnics 1	-	3	10
ARC531	Design Procedures for Architecture 1	-	3	10
ARC561	AutoCAD-3D	-	3	10
ARC521	Engineering Management and Economics	-	3	10
Total			**18**	**60**

Semester 2 (Level 5)				
Module Code	**Modules**	**Pre-requi-sites**	**Credit Hours (ASU)**	**Credits (LSBU)**
ARC542	Structural Design 2	-	3	10
ARC532	Design Procedures for Architecture 2	ARC531	3	10
ARC552	Architectural Engineering Field Studies	-	3	10
ARC562	Building Information Modeling	-	3	10
ARC522	Engineering Ethics	-	3	10
ARC533	Internship	-	3	10
Total			**18**	**60**

Year 4

Semester 1 (Level 6)				
Module Code	Modules	Pre-requi-sites	Credit Hours (ASU)	Credits (LSBU)
ARC 631	Project 1	Pass Year 2	3	10
ARC 641	Structural Design and Analysis 1	ARC542	3	10
ARC 611	Engineering Research Methods	-	3	10
ARC 671	Energy Conservation in Buildings	-	3	10
ARC 672	Thermodynamics for Buildings	-	3	10
ARC 621	Forensic Engineering and Conservation	-	3	10
Total			18	60

Semester 2 (Level 6)				
Module Code	Modules	Pre-requi-sites	Credit Hours (ASU)	Credits (LSBU)
ARC 632	Project 2	ARC 631	3	10
ARC 651	Geotechnics 2	ARC532	3	10
ARC 622	Innovation, Enterprise and Management	-	3	10
ARC 633	Design project	ARC532	6	20
ARC 642	Structural Design and Analysis 2	ARC 641	3	10
Total			18	60

Source: UBC. Green Building URL: https://sustain.ubc.ca/campus-initiatives/green-buildings Jan.2018

Programme Outcomes

The course outcomes have been developed with reference to the JBM guidelines, UK-SPEC, and the benchmark statement for Engineering (E). They are also summarised in the Output Standards Specification provided for the Joint Board of Moderators.

A. Knowledge and Understanding

Students will have knowledge and understanding of:

A.1	Mathematics as a means of communicating results, concepts, and ideas that are relevant to Architectural Design engineering (E).
A.2	The fundamental concepts, principles, and theories of civil engineering and architecture (E).
A.3	The concepts, principles and theories of structural analysis, soil mechanics, and design to an advanced level (E).
A.4	Information and Communications Technology relevant to architectural and civil engineering (E).
A.5	The general principles of engineering design and construction and the application of specific design techniques to particular elements and systems (E).
A.6	The characteristics and behaviour of engineering materials (E).
A.7	Management and business practices that are relevant to the construction industry (E).
A.8	The role of the engineer in society, including the global and social context of the built environment (E).
A.9	Sustainability issues and the importance of architectural engineering to the quality of the environment. (E).
A.10	Health and safety issues, risk assessment, quality issues and regulatory frameworks (E).
A.11	Context in which engineering knowledge can be applied.

Teaching and learning strategy

Acquisition of 1, 2 and 6 is through a combination of lectures, seminars, tutorials, practical classes, coursework, design, and project work at Levels 4 and 5 Acquisition of 3 is through lectures, tutorials, coursework, and project work at Level 6 of the course. Acquisition of 4 is through a combination of lectures and practical work at Level 4. This is developed further in the majority of units at all Levels of the course either through formal classes or self-directed study. Acquisition of 5 is through a combination of lectures, seminars, individual and group-based design exercises at all Levels, and the use of self-directed CAD tutorials. Acquisition of 7 is through a combination of lectures, seminars, tutorials,

student role-plays, discussion of students' current work-based problems, coursework, and project work at all Levels of the course. Acquisition of 8, 9, 10 and 11 is through lectures (including those from practising engineers), seminars, field work, sites visits, coursework, and projects at all Levels of the course. Throughout the course students have module guides relevant to each topic of study, giving additional reading material which students are encouraged to use for private study to consolidate the formal learning process, and both broaden and deepen their knowledge and understanding in the subject area. All students are encouraged to become student members of the professional Institutions, use their libraries and resources, and attend meetings.

Assessment

Testing of the knowledge base is through a combination of unseen written examinations (1,2,3,5), problem solving exercises (1,2,3,4), essays (7,8,10), oral presentations (2,4,5,7,8), student-led seminars (5,8,9,10), design exercises (2,3,5,9,10), laboratory reports (2,3,6), poster displays (5,8,9,10), and individual and group projects (2,3,4,5,7,8 9).

B. Intellectual Skills

Students will develop their intellectual skills such that they are able to:

B.1	Use mathematical methods to analyse engineering problems (E).
B.2	Analyse and solve engineering problems (E).
B.3	Design engineering elements and whole systems to meet a need, critically evaluate, and make improvements (E).
B.4	Apply engineering knowledge and understanding in the solution of problems and the development of designs (E).
B.5	Undertake research, obtain and evaluate primary and secondary data (E).
B.6	Plan, conduct and report on an individual research course.
B.7	Be aware of all the relevant frameworks in solving problems and designing systems, taking into account financial aspects, risk analysis and environmental impact (E).
B.8	Use creativity and innovation in designing solutions.

Teaching and learning strategy

Intellectual skills are developed through the teaching and learning course. Analysis and problem-solving skills are further developed through regular tutorial sheets. Experimental, research, and design skills are further developed through coursework exercises, laboratory and fieldwork, and research and design projects. Individual feedback is provided to students in all work submitted.

Assessment

Analysis and problem-solving skills are assessed through unseen written examinations, critiques and viva voce examinations. Experimental, research, and design skills are assessed through laboratory reports, coursework exercises, project reports, poster displays and oral presentations.

C. Practical Skills

Students will acquire and develop practical skills in Architectural Design Engineering such that they are able to:

C.1	Carry out safely a series of planned experiments (E).
C.2	Use laboratory and field work equipment to generate data (E).
C.3	Analyse experimental results and determine their validity and accuracy (E).
C.4	Prepare technical reports
C.5	Give technical presentations using a variety of media.
C.6	Prepare technical drawings including the use of CAD and freehand sketching
C.7	Use the library, internet and other sources effectively (E)
C.8	Use computer packages (E).
C.9	Manage projects efficiently (E).

Teaching and learning strategy

Practical skills are developed through the teaching and learning programme. Experimental and fieldwork skills (1-3) are developed through laboratory experiments, fieldwork, and project work.

Skills 4 and 5 are taught in the Engineering Practice and Design module at Level 4 and further developed in reports and presentations throughout the course. Skill 6 is taught at Level 4 and further developed through design coursework exercises. Skill 7 is taught through project work. Skill 8 and 9 are taught and developed through coursework exercises and project work.

Assessment

Practical skills are assessed through laboratory experiment reports, coursework exercises, project reports and presentations.

D. Transferrable Skills

Students will acquire and develop transferrable skills such that they are able to:

D.1	Communicate effectively - oral presentations, report writing, drawing (E).
D.2	Apply mathematical skills.
D.3	Work independently
D.4	Manage time and work to deadlines (E).
D.5	Use Information and Communications Technology (E).
D.6	Work constructively as a member of a group (E).
D.7	Manage tasks and solve problems, transfer techniques and solutions from one area to another, apply critical analysis and judgement (E).
D.8	Learn effectively for the purpose of continuing professional development and in a wider context throughout their career (E).

Teaching and learning strategy

Transferable skills are developed through the teaching and learning programme.

Skill 1 is taught at Level 1 and developed in coursework and presentations.

Skill 2 is taught formally at Level 4 and developed throughout the course.

Skill 3 is supported through the provision of unit guides.

Skill 4 is developed through setting coursework deadlines.

Skill 5 is developed through laboratory experiments, project work, presentations, and individual learning.

Skill 6 is developed in laboratory work, fieldwork, and group project work.

Skill 7 is developed in the technical subject areas of the course.

Although not explicitly taught, other skills are nurtured and developed throughout the course which is structured and delivered in such a way as to promote this.

Assessment

Skill 1 is assessed by coursework exercises, laboratory and field study reports, presentations and oral examinations.

Skill 2 is assessed through unseen written examinations and coursework.

Skill 4 is assessed by applying penalties for failure to meet deadlines.

Skill 5 is formally assessed at Level 4 and further assessed throughout the course where ICT is used.

Skill 6 is assessed in group work projects.

Skill 7 is assessed through unseen written examinations, coursework exercises, design work, and individual and group project work.

The other skills are not formally assessed.

Mapping of courses against programme learning outcomes (Level S)

T = taught, D = developed, A = assessed, X = all

Module Title	Engineering science 1	Engineering science 2	Study Skills and Professional Practice	Laboratory and Workshop Skills	Mathematics 1	Mathematics 2	Constructing the Built Environment	Principles of Engineering	Intermediate English	Advanced English	Computer Programming for Engineering	Bahrain Civilisation and History	Human Rights	Arabic Language	Arabic Language for Non-Arabic Speakers
Level	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**
PLO	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**
A1	DTA	DTA		DTA	DTA	DTA	DTA	DTA							
A2			DTA				DTA	DTA			DTA				
A3	DTA	DTA	D	DTA			DTA	DTA		DTA	D	D	D		
A4			D	DTA	DT	DT	D	D			DT			D	D
B1			D						D	DT	D			D	D
B2			D	DT	DT	DT	DTA	DTA	D	DT	DTA	D	D		
B3	D	D	DTA				DT	DT			D				
B4	DT	DT					DT	DT	D	D	DTA	D	D		
C1	DT	DT	DTA	DTA			DTA	DT	T	T	T				
C2			DT				DT	DT	T	T	DT				
C3			DTA	DTA			DTA				DT				
C4			DTA	TA			DTA	DTA	T	DTA	DTA	T	T	T	T
C5			DTA	DT	DTA	DTA	DT	DT		DT	DTA	DT	DT		
C6			DTA	DT			DT	DT	D	D	DTA	D	D	D	D
D1	D	D	DTA	DTA	D	D	D	D	D	D	D	D	D	D	D
D2	D	D	DTA				DT	D			DTA		D		
D3			DTA				DTA	D		D	DT	D	D		
D4			DTA				DTA	DT		D	DT				
D5	D	D	DTA		DT	DT	DT	DT	D	D	DT	D	D	D	D
D6			DTA	D			DTA	DT			DT				

Mapping of courses against programme learning outcomes (Level 4)

T = taught, D = developed, A = assessed,

Module Title	Engineering Mathematics 1	Engineering Mathematics 2	Principles of Engineering Science 1	Principles of Engineering Science 2	Engineering Practice and Design 1	Engineering Practice and Design 2	Architectural Engineering Design and Structures 1	Architectural Engineering Design and Structures 2	CAD Graphics	Integrated Design and Construction	Building Technology	Building Environment Simulation and Analysis
Level	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**
PLO	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**
A1	TDA	TDA					TDA	TDA				
A2			TDA	TDA			TDA	TDA	TD	TDA	TDA	TD
A3			TDA	TDA			TDA	TDA	TD	TD	TD	
A4					TDA	TDA	TDA	TDA	TDA	TD	TD	TD
A5					TDA	TDA			TD	TDA		
A6			TDA	TDA							TD	TD
A7					TDA	TDA				TDA		
A8					TDA	TDA				TD		
A9					TDA	TDA				TD	TD	TDA
A10					TDA	TDA				D	D	TD
A11										TDA	TDA	TDA
B1	TDA	TDA	TDA	TDA			DA	DA			DA	DA
B2			TDA	TDA			DA	DA	TDA	TDA	TDA	TD
B3										TD	D	D
B4									TDA	TDA	TDA	TDA
B5									D	TD	D	D
B6									D	D	D	D
C1					TDA	TDA						
C2					TDA	TDA					T	
C3					TDA	TDA					TD	TD
C4					TDA	TDA	DA	DA	TDA	TDA	TDA	TDA
C5					TDA	TDA			TDA	TDA	TDA	TDA
C6					TDA	TDA	TDA	TDA	TDA			
C7					TDA	TDA	DA	DA	TDA	DA	DA	DA
C8					TDA	TDA	DA	DA	TDA	TD	TD	TDA
C9									D		D	
D1					TDA	TDA	D	D	TDA	TDA	TDA	D
D2	TDA	TDA					D	D	D		D	
D3	TDA	TDA	TDA	TDA	TDA	TDA			TDA	TDA	TDA	TDA
D4	TDA	TDA	DA	DA	TDA	TDA	D	D	TDA	TDA	TDA	TDA
D5					TDA	TDA	D	D	TDA	TDA	TD	D
D6					TDA	TDA			D	DT	D	D
D7									TD	TD	TD	TD
D8					TDA	TDA			TD	D	D	D

Mapping of courses against programme learning outcomes (Level 5)

T = taught, D = developed, A = assessed,

Module Title	Structural Design 1	Structural Design 2	Advanced Engineering Mathematics	Geotecchnics 1	Design Procedures for Architectural 1	Design Procedures for Architectural 2	Architectural Engineering Field Studies	AutoCAD-3D	Engineering Management and Economics	Building Information Modelling	Engineering Ethics	Internship
Level	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
PLO	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**
A1	TDA	TDA	TDA	DA						TD		
A2	TDA	TDA		TDA								
A3	TDA	TDA		TDA								
A4	D	D			TDA	TDA	D	TDA		TDA	TD	
A5	TDA	TDA					D	TDA	D	TD		
A6	TDA	TDA		TDA			TDA					
A7							TDA		TDA		TD	
A8	D	D					TDA		TD		TDA	TDA
A9	D	D			TDA	TDA	TD	D	D		TDA	D
A10	D	D					TD		TDA	D	TD	TD
A11	D	D			TDA	TDA	TDA	D	D	D	TD	TD
B1	TDA	TDA	TDA	DA								
B2	TDA	TDA		T A				TD	D	TD	D	D
B3	TDA	TDA		TDA				TD	D	D		
B4								D	D	DA		
B5	TDA	TDA					D	DA	DA	DA		
B6							DA	DA	DA	DA	DA	DA
C1				TDA								
C2												
C3				TDA				DA		DA		DA
C4				DA	TDA	TDA		TDA	TDA	TDA	D	TDA
C5								TDA	TDA	TDA	D	TDA
C6	TDA	TDA			TDA	TDA	DA	TDA		TDA		D
C7	D	D		D	TDA	TDA	D	D	D	D	D	D
C8	TDA	TDA			TDA	TDA	D	TDA	TD	TDA	D	TDA
C9							TDA	TD	TDA	TD		D
D1	TA	TA		TDA	TDA	TDA		TDA	TDA	TDA	DA	TDA
D2	TDA	TDA		DA					TDA	D		D
D3	D	D		D			D	TDA	TDA	TDA	TDA	TDA
D4	DA	DA		DA			DA	D	D	D	D	D
D5			DA					TDA	TDA	TDA	D	D
D6			D	D	TDA	TDA	TDA	D	D	TDA	D	DA
D7	DA	DA	DA	TDA				DA	D	DA	D	DA
D8	D	D			TDA	TDA	D	D	D	D	D	D

Mapping of courses against programme learning outcomes (Level 6)

T = taught, D = developed, A = assessed,

Module Title	Project 1	Project 2	Structural Design and Analysis 1	Structural Design and Analysis 2	Geotechnincs 2	Innovation, Enterprise and Management	Design Project	Forensic Engineering and Conservation	Engineering Research Methods	Energy Conservation in Buildings	Thermodynamics for Buildings
Level	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**
PLO	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**20/6**	**10/3**	**10/3**	**10/3**	**10/3**
A1	D	D	TDA	TDA	DA			D	TDA	TDA	TDA
A2	D	D	TDA	TDA	TDA			TDA		TDA	TDA
A3	TDA	TDA	TDA	TDA	TDA			TDA		TDA	D
A4	DA	DA	DA	DA		D		D	DA	TDA	TDA
A5	TDA	TDA	DA	DA	TDA		TDA	TDA		TDA	DA
A6	DA	DA	DA	DA	TDA			TDA			DA
A7	D	D				D		D		D	D
A8	D	D	D	D	D			TD		D	D
A9	D	D	D	D	DA		TDA	TD		TDA	DA
A10	DA	DA	D	D	DA	TDA		TDA		D	D
A11	D	D	D	D	D		DA		D	D	D
B1	TDA	TDA	DA	DA	D				DA	DA	DA
B2	DA	DA	TDA	TDA	TDA	D		TDA	DA	TDA	TDA
B3	DA	DA	DA	DA	TDA	DA	TDA	TD	D	DA	DA
B4	TDA	TDA						TDA	D	DA	DA
B5	TDA	TDA	T A	T A	D	TDA		TDA	TDA	DA	DA
B6	DA	DA	TDA	TDA		TDA		TD	TDA	DA	DA
C1	DA	DA	TDA	TDA				D	D	DA	DA
C2	DA	DA	TDA	TDA				D	DA	D	TDA
C3	DA	DA	TDA	TDA				D	TDA	DA	DA
C4	TDA	TDA	DA	DA			DA	DA	TDA	TDA	TDA
C5	DA	DA	DA	DA			A	DA	TDA	DA	DA
C6	DA	DA	DA	DA			DA	D			
C7	D	D	D	D	DA	D	DA	D	D	D	D
C8	D	D	D	D	DA		DA		D	DA	DA
C9									D		
D1	DA	DA			DA		DA	DA	TDA	DA	DA
D2			TDA	TDA	DA			D	DA	TDA	TDA
D3	DA	DA	D	D	D		DA	D	D	DA	DA
D4	DA	DA	D	D	DA	DA		DA	D	D	D
D5	D	D			D	D		D	D	D	D
D6					D		DA		D	D	D
D7	DA	DA	TDA	TDA	DA	TDA	D	TDA	DA	TDA	TDA
D8	DA	DA	D	D	DA	DA	D	TDA	D	D	D

B.Eng. (Hons) Architectural Design Engineering
Modules Brief Descriptions

ARC 411 Engineering Mathematics 1

This module consolidates the mathematical skills that underpin the B.Eng. Engineering degrees.

ARC 412 Engineering Mathematics 2

This module consolidates the mathematical skills that underpin the B.Eng. Engineering degrees. **(Prerequisite: ARC 411)**

ARC 413 Principles of Engineering Science 1

This module develops the students' understanding of essential scientific principles for the study of engineering to degree level. It is designed to be accessible to students with a wide range of prior science specialisation. The subject comprises two blocks of study, common to all engineering disciplines and introduces the principles of measurement systems and units and thermal physics.

ARC 414 Principles of Engineering Science 2

This module develops the students' understanding of essential scientific principles for the study of engineering to degree level. It is designed to be accessible to students with a wide range of prior science specialisation. The subject comprises two blocks of study, common to all engineering disciplines. This module introduces mechanical and electrical principles, and engineering materials and their properties. **(Prerequisite: ARC 413)**

ARC 431 Architectural Engineering Design and Structures 1

This module focuses on Design Principles. The module explains fundamentals of mechanics of structures. Numerous worked examples are used to complement the understanding of mechanics. Students are introduced to structural elements and associated load types, the various support types and the calculation of structural section properties. Also covered are the axial, shear, bending and torque load distributions in simple determinate structures.

ARC 432 Architectural Engineering Design and Structures 2

This module focuses on the area of Structural Analysis. The module explains fundamentals of mechanics of structures. Numerous worked examples are used to complement the understanding of mechanics. Students are introduced to structural elements and associated load types, the various support types and the calculation of structural section properties. Also covered are the axial, shear, bending and torque load distributions in simple determinate structures.

ARC 433 Engineering Practice and Design 1

The module covers design activities, sustainable development principles, and transferable skills.

ARC 434 Engineering Practice and Design 2

The module covers practical work, project management, health and safety and risk management, and transferable skills.

ARC 435 Integrated Design and Construction

The course provides an integrated insight into the design and construction processes. It is designed specifically to provide an overview of design and construction management skills, competencies and tasks.

ARC 436 Building Technology

Building services engineers are responsible for the design, installation, and operation and monitoring of the mechanical, electrical and public health systems required for the safe, comfortable and environmentally friendly operation of modern buildings. This course covers all of these services and their management.

ARC 462 Building Environment Simulation and Analysis

This course aims to provide a general understanding of, and practical experience in, computer modelling software systems which are used for simulating and predicting the environmental performance of buildings. A theoretical explanation of the processes simulated in the computer models; such as heat transfer, air flow and lighting; is followed by a description of individual software packages and practical workshops using each package.

ARC 511 Advanced Engineering Mathematics

This module covers advanced undergraduate engineering mathematics.

ARC 521 Engineering Management and Economics

This module helps to prepare the student for their future role as professional engineers in a number of ways. It includes:

- detailed study of project planning techniques, including network techniques, with preparation for the students' individual projects
- an overview of the business functions which interact with engineering.
- an introduction to Systems Thinking. A formal method for studying systems will be introduced.
- an introduction to recruitment, retention and equal opportunities in employment
- the use of published Standards in engineering

- use of the BSI website to access national and international standards
- an introduction to statistics and their use in managing engineering processes
- an introduction to Quality Management, with particular reference to the ISO 9000 series
- An introduction to European Directives and harmonised standards
- Writing technical business reports, including the importance of acknowledging published sources and the use of formal methods for doing so.

ARC 522 Engineering Ethics

This course introduces the theory and the practice of engineering ethics using a multi-disciplinary and cross-cultural approach. Theory includes ethics and philosophy of engineering. Historical cases are taken primarily from the scholarly literature on engineering ethics, and hypothetical cases are written by students.

ARC 531 Design Procedures for Architecture 1

This module consists of a personal student architectural design project embracing design studio and technology studio against a defined brief.

ARC 532 Design Procedures for Architecture 2

This module consists of a personal student architectural design project embracing design studio and technology studio against a defined brief. **(Prerequisite: ARC 531)**

ARC 533 Internship

This course provides the students with an opportunity to experience the industrial world and be part of a team working on the real-world project. The University assists each student to find the most suitable industry.

ARC 541 Structural Design 1

This module develops students' practice with structures into the design of concrete elements and structures using hand and computer methods. Recycling of materials, whole life costing, sick buildings are covered and the safety of building work during construction including CDM Regulations are addressed. RC detailing is introduced. Hand drawing and freehand sketching skills are taught.

ARC 542 Structural Design 2

This module develops students' practice with structures into the design of steel and timber elements and structures using hand and computer methods. Recycling of materials, whole life costing, sick buildings are covered and the safety of building work during construction including CDM Regulations are addressed. Hand drawing and freehand sketching skills are taught.

ARC 551 Geotechnics 1

This module introduces to the students a number of simple concepts and models which are used to describe soil and its mechanical behaviour. Standard laboratory tests are carried out and soil properties derived from the results.

ARC 552 Architectural Engineering Field Studies

This is substantially a project-based learning module. It seeks to bring together construction and materials needed for design, surveying for execution, and some geology. It emphasises the link between materials and site geological properties and their relationship with design and execution. There will be a block week devoted to a Constructionarium type activity and others including geological and site visits. Multimedia support will feature in the delivery.

ARC 561 AutoCAD-3D

The course covers key command revision, 3D viewing, viewports and coordinate systems, wireframe modelling, surface modelling and meshing, solid modelling, studio effects, materials and lighting, and Boolean operators.

ARC 562 Building Information Modelling

This module introduces the concepts of Building Information Modelling (BIM) through the development of architectural 3D models on industry standard parametric CAD systems. It covers the practical competence of architectural modelling and provides exposure to coordinating building information models.

ARC 611 Engineering Research Methods

The module studies the scope and significance of engineering research. It introduces students to the various aspects of engineering research; its types, tools and methods and students will learn how to apply research techniques to real-world situations. The module covers areas such as the identification of a topic by the student, proposition of hypothesis, formulation of research inquiries, development of literature review, selection of research design and methodologies. Additionally, students will learn data collection techniques; primary and secondary data collection with application to specific problems, scaling and research instrument design and sampling design.

ARC 621 Forensic Engineering and Conservation

This module uses mainly case studies to look at the influence of failures on the evolution of professional practice. It teaches students an understanding of holistic design applications, conservation, and the role of regulations. It teaches, develops and assesses observational, deductive, creative and communications skills.

ARC 622 Innovation, Enterprise and Management

The module is intended to be practical, with students developing some appropriate ideas

of their own in such a way that they become practical, profitable propositions. Students will practice ways of finding ideas, testing those ideas and developing them, and will write their own business strategies, risk assessments and scenario testing so that they demonstrate the commercial viability of their ideas.

ARC 631 Project 1

In this module, students must plan, execute, review and report upon a piece of project work related to the B.Eng. course. A module Guide for the project is augmented by 4 lectures.

ARC 632 Project 2

In this module, students must plan, execute, review and report upon a piece of project work related to the B.Eng course. A module Guide for the project is augmented by 4 lectures. **(Prerequisite: ARC 631)**

ARC 633 Design Project

In this module, students must undertake their main architectural design project embracing design studio and technology studio against a defined brief. **(Prerequisite: ARC 532)**

ARC 641 Structural Design and Analysis 1

This module builds on the previous studies in structures. The moment distribution method for beams and frames is introduced. The plastic analysis of beams, frames and slabs is covered. The matrix stiffness method is outlined using computer software. There is a brief introduction to the dynamic analysis of structures.

The module extends the students' knowledge of material use, analysis of structural form, and ability to design in both qualitative and quantitative directions. Problems from the IStructE Part 3 papers are selected so that students can develop their analytical confidence to choose appropriate structural forms and materials and support their choice in critical peer review. **(Prerequisite: ARC 542)**

ARC 642 Structural Design and Analysis 2

This module builds on the previous studies in structures. The moment distribution method for beams and frames is introduced. The plastic analysis of beams, frames and slabs is covered. The matrix stiffness method is outlined using computer software. There is a brief introduction to the dynamic analysis of structures. **(Prerequisite: ARC 641)**

The module extends the students' knowledge of material use, analysis of structural form, and ability to design in both qualitative and quantitative directions. Problems from the IStructE Part 3 papers are selected so that students can develop their analytical confidence to choose appropriate structural forms and materials and support their choice in critical peer review.

ARC 651 Geotechnics 2

This module is intended to provide an understanding of the application of theory to the analysis and design of geotechnical structures. **(Prerequisite: ARC 532)**

ARC 671 Energy Conservation in Building

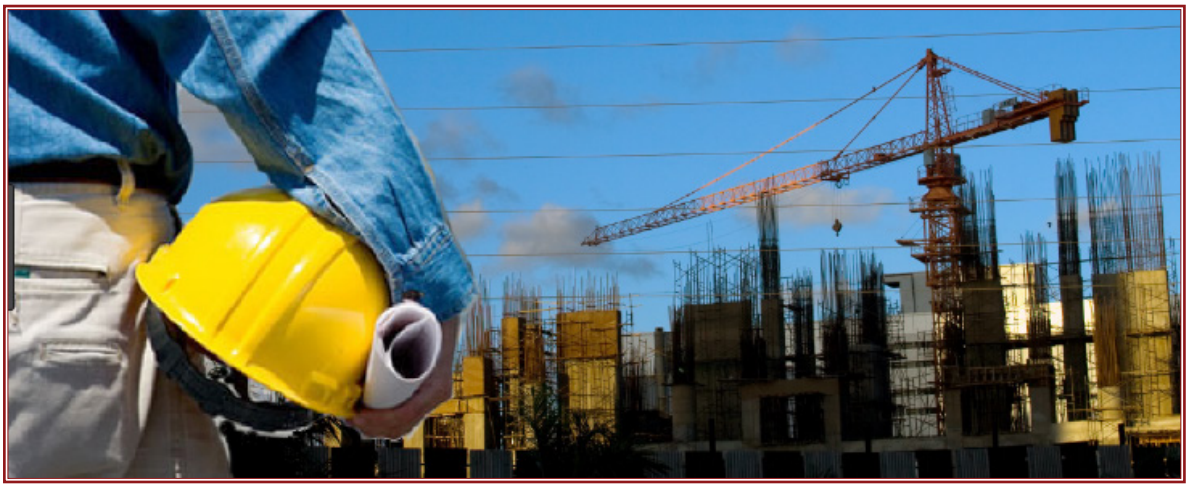
This course will provide students with the ability to quantify the energy available from sun, wind, sea, river, or the earth for a given application at a given site. Students will develop the skills to understand and analyse the potential and limitations of the available energy conversion devices and exercise basic engineering judgment in their application.

ARC 672 Thermodynamics for Buildings

This module covers the principles of heat transfer, fluid flow and thermodynamics for application to buildings and their engineering systems.

ARC 461 CAD Graphics

" Topics include intermediate CAD operations, editing drawings, construction multi-view drawings, applying text, font, style commands, dimensioning, hatching, blocks, construction 3D objects and modifying solids objects".



B.Eng. (Hons) Civil and Construction Engineering

Aims and objectives:

The B.Eng. (Hons) in Civil and Construction Engineering aims to:

- Produce graduates who are committed to a career in civil engineering and construction industry with a range of employers in a variety of countries.
- Produce graduates equipped for postgraduate study and to take up responsible professional employment in the construction industry and become lifelong learners with an appreciation of the value to society of an education in civil engineering.
- Produce graduates who have a breadth and depth of knowledge and understanding of the key aspects of civil engineering.
- Allow graduates to acquire and develop analytical and problem-solving skills, and subject-specific skills. To acquire and develop the ability to evaluate evidence, arguments and assumptions, to reach sound judgements and communicate effectively.
- Develop graduates who approach design problems creatively and who have the technical skills to see their ideas through to realisation.
- Create an educational environment that benefit from practical experience.
- Provide an engineering education, centred within the built environment that recognises the important roles of other professions in the development of the built environment and cultivates interaction and teamwork with these other professionals.

Provide graduates with the necessary academic qualification which equips them to enter advanced postgraduate study thus satisfying an approved course of further learning comprising the full educational base for a Chartered Engineer.

Source: SARNASH GROUP, URL: http://www.saranshgroup.org/civil, Jan.2018

B.Eng. (Hons) Civil and Construction Engineering

Study Plan

Year 2

Semester 1 (Level 4)				
Module Code	**Modules**	**Pre-requisites**	**Credit Hours (ASU)**	**Credits (LSBU)**
CIV431	Engineering Practice and Design 1	-	3	10
CIV411	Engineering Mathematics 1	-	3	10
CIV461	Surveying and Structures 1	-	3	10
CIV413	Principles of Engineering Science 1	-	3	10
CIV441	Structural Design	-	3	10
CIV471	Environmental Engineering	-	3	10
Total			**18**	**60**

Semester 2 (Level 4)				
Module Code	**Modules**	**Pre-requisites**	**Credit Hours (ASU)**	**Credits (LSBU)**
CIV432	Engineering Practice and Design 2	CIV 431	3	10
CIV412	Engineering Mathematics 2	CIV 411	3	10
CIV462	Surveying and Structures 2	CIV 461	3	10
CIV414	Principles of Engineering Science 2	CIV 413	3	10
CIV422	Engineering Ethics	-	3	10
CIV451	Soil Mechanics	-	3	10
Total			**18**	**60**

Year 3

Semester 1 (Level 5)				
Module Code	**Modules**	**Pre-requisites**	**Credit Hours (ASU)**	**Credits (LSBU)**
CIV533	Design and Construction 1	-	3	10
CIV561	Civil Engineering Drawing and Surveying	-	3	10
CIV511	Advanced Engineering Mathematics	-	3	10
CIV571	Hydraulics	-	3	10
CIV542	Structural Mechanics	-	3	10
CIV581	Infrastructure and Highway Engineering	-	3	10
Total			**18**	**60**

Semester 2 (Level 5)				
Module Code	**Modules**	**Pre-requisites**	**Credit Hours (ASU)**	**Credits (LSBU)**
CIV534	Design and Construction 2	CIV 433	3	10
CIV541	Theory of Structures	-	3	10
CIV535	Civil Engineering and Construction Field Study	-	3	10
CIV521	Engineering Management and Economics	-	3	10
CIV543	Advanced Structural Analysis and Design	-	3	10
CIV531	Internship	-	3	10
Total			**18**	**60**

Year 4

Semester 1 (Level 6)				
Module Code	**Modules**	**Pre-requisites**	**Credit Hours (ASU)**	**Credits (LSBU)**
CIV641	Structural Design and Analysis 1	CIV 561	3	10
CIV643	Civil Engineering Materials	-	3	10
CIV652	Foundations	-	3	10
CIV632	Engineering Systems Design	CIV 534	3	10
CIV631	Engineering Research Methods	-	3	10
CIV621	Innovation, Enterprise and Management	-	3	10
Total			**18**	**60**

Semester 2 (Level 6)				
Module Code	**Modules**	**Pre-requisites**	**Credit Hours (ASU)**	**Credits (LSBU)**
CIV634	Current Topic in Civil and Construction Engineering	-	3	10
CIV651	Geotechnical Engineering	CIV 451	3	10
CIV642	Structural Design and Analysis 2	CIV 641	3	10
CIV633	Construction Management	-	3	10
CIV635	Project	Pass Year 2	6	20
Total			**18**	**60**

Programme Outcomes

The course outcomes have been developed with reference to the JBM guidelines, UK-SPEC, and the benchmark statement for Engineering (E). They are also summarised in the Output Standards Specification provided for the Joint Board of Moderators.

A. Knowledge and Understanding

Students will have knowledge and understanding of:

A.1	Mathematics as a means of communicating results, concepts, and ideas that are relevant to Architectural Design engineering (E).
A.2	The fundamental concepts, principles, and theories of civil engineering and architecture (E).
A.3	The concepts, principles and theories of structural analysis, soil mechanics, and design to an advanced level (E).
A.4	Information and Communications Technology relevant to architectural and civil engineering (E).
A.5	The general principles of engineering design and construction and the application of specific design techniques to particular elements and systems (E).
A.6	The characteristics and behaviour of engineering materials (E).
A.7	Management and business practices that are relevant to the construction industry (E).
A.8	The role of the engineer in society, including the global and social context of the built environment (E).
A.9	Sustainability issues and the importance of architectural engineering to the quality of the environment. (E).
A.10	Health and safety issues, risk assessment, quality issues and regulatory frameworks (E).
A.11	Context in which engineering knowledge can be applied.

Teaching and learning strategy

Acquisition of A1, A2 and A6 is through a combination of lectures, seminars, tutorials, practical classes, coursework, design, and project work at Levels 4 and 5. Acquisition of A3 is through lectures, tutorials, coursework, and project work at Level 6 of the course. Acquisition of A4 is through a combination of lectures and practical work at Level 4. This is developed further in the majority of modules at all levels of the course either through formal classes or self-directed study. Acquisition of A5 is through a combination of lec-

tures, studios, seminars, individual and group-based design exercises at all levels, and the use of self-directed CAD tutorials. Acquisition of A7 is through a combination of lectures, seminars, tutorials, student role-plays, discussion of students' current work-based problems, coursework, and project work at all levels of the course. Acquisition of A8, A9, A10 and A11 is through lectures (including those from practicing engineers), seminars, fieldwork, site visits, coursework, and projects at all levels of the course. Throughout the course students have module guides relevant to each topic of study, giving additional reading material which students are encouraged to use for private study to consolidate the formal learning process, and both broaden and deepen their knowledge and understanding in the subject area.

Assessment

Testing of the knowledge base is through a combination of unseen written examinations (A1, A2, A3 and A5), problem-solving exercises (A1, A2, A3 and A4), essays (A7, A8 and A10), oral presentations (A2, A4, A5, A7 and A8), student-led seminars (A5, A8, A9 and A10), design exercises (A2, A3, A5, A9, A10 and A11), laboratory reports (A2, A3 and A6), poster displays (A5, A8, A9 and A10), and individual and group projects (A2, A3, A4, A5, A7, A8, A9 and A11).

B. Intellectual Skills

Students will develop their intellectual skills such that they are able to:

B.1	Use mathematical methods to analyse engineering problems (E).
B.2	Analyse and solve engineering problems (E).
B.3	Design engineering elements and whole systems to meet a need, critically evaluate, and make improvements (E).
B.4	Apply engineering knowledge and understanding in the solution of problems and the development of designs (E).
B.5	Undertake research, obtain and evaluate primary and secondary data (E).
B.6	Plan, conduct and report on an individual research course.
B.7	Be aware of all the relevant frameworks in solving problems and designing systems, taking into account financial aspects, risk analysis and environmental impact (E).
B.8	Use creativity and innovation in designing solutions.

Teaching and learning strategy

Intellectual skills are developed through the teaching and learning course. Analysis and problem-solving skills are further developed through regular tutorial sheets. Experimental, research, and design skills are further developed through coursework exercises, laboratory and fieldwork, and research and design projects. Individual feedback is provided to students in all work submitted.

Assessment

Analysis and problem-solving skills are assessed through unseen written examinations, critiques and viva voce examinations. Experimental, research, and design skills are assessed through laboratory reports, coursework exercises, project reports, poster displays and oral presentations.

C. Practical Skills

Students will acquire and develop practical skills in Architectural Design Engineering such that they are able to:

C.1	Carry out safely a series of planned experiments (E).
C.2	Use laboratory and field work equipment to generate data (E).
C.3	Analyse experimental results and determine their validity and accuracy (E).
C.4	Prepare technical reports
C.5	Give technical presentations using a variety of media.
C.6	Prepare technical drawings including the use of CAD and freehand sketching
C.7	Use the library, internet and other sources effectively (E)
C.8	Use computer packages (E).
C.9	Manage projects efficiently (E).
C.10	Use surveying equipment

Teaching and learning strategy

Practical skills are developed through the teaching and learning course. Experimental and fieldwork skills (C1 to C3) are developed through laboratory experiments, fieldwork and project work. C4 and C5 are taught in the Engineering Practice and Design module at Level 4 and further developed in reports and presentations throughout the course. C6 is taught at Level 4 and further developed through design coursework exercises. C7 is taught through project work. C8 and C9 are taught and developed through coursework exercises and project work. C10 is taught in the Surveying module.

Assessment

Practical skills are assessed through laboratory experiment reports, coursework exercises, project reports and presentations.

D. Transferrable Skills

Students will acquire and develop transferrable skills such that they are able to:

D.1	Communicate effectively - oral presentations, report writing, drawing (E).
D.2	Apply mathematical skills.
D.3	Work independently
D.4	Manage time and work to deadlines (E).
D.5	Use Information and Communications Technology (E).
D.6	Work constructively as a member of a group (E).
D.7	Manage tasks and solve problems, transfer techniques and solutions from one area to another, apply critical analysis and judgement (E).
D.8	Learn effectively for the purpose of continuing professional development and in a wider context throughout their career (E).

Teaching and learning strategy

Transferable skills are developed through the teaching and learning course. D1 is taught at Level 4 and developed in coursework and presentations. D2 is taught formally at Levels 4 and 5 and developed throughout the course. D3 is supported through the provision of module guides. D4 is developed through setting coursework deadlines. D5 is developed through laboratory experiments, project work, presentations and individual learning. D6 is developed in laboratory work, fieldwork and group project work. D7 is developed in the technical subject areas of the course. Although not explicitly taught, other skills are nurtured and developed throughout the course which is structured and delivered in such a way as to promote this.

Assessment

D1 is assessed by coursework exercises, laboratory and field study reports, presentations and oral examinations. D2 is assessed through unseen written examinations and coursework. D4 is assessed by applying penalties for failure to meet deadlines. D5 is formally assessed in the Engineering Practice and Design module and further assessed throughout the course where ICT is used. D6 is assessed in group work projects. D7 is assessed through unseen written examinations, coursework exercises, design work, and individual and group project work. The other skills are not formally assessed.

Source: SARNASH GROUP, URL: http://www.saranshgroup.org/civil, Jan.2018

Mapping of courses against programme learning outcomes (Foundation Year)

T = taught, D = developed, A = assessed, X = all

Module Title	Engineering science 1	Engineering science 2	Study Skills and Professional Practice	Laboratory and Workshop Skills	Mathematics 1	Mathematics 2	Constructing the Built Environment	Principles of Engineering	Intermediate English	Advanced English	Computer Programming for Engineering	Bahrain Civilisation and History	Human Rights	Arabic Language	Arabic Language for Non-Arabic Speakers
Level	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**	**S**
PLO	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**
A1	DTA	DTA		DTA	DTA	DTA	DTA	DTA							
A2			DTA				DTA	DTA			DTA				
A3	DTA	DTA	D	DTA			DTA	DTA		DTA	D	D	D		
A4			D	DTA	DT	DT	D	D			DT			D	D
B1			D						D	DT	D			D	D
B2			D	DT	DT	DT	DTA	DTA	D	DT	DTA	D	D		
B3	D	D	DTA				DT	DT			D				
B4	DT	DT					DT	DT	D	D	DTA	D	D		
C1	DT	DT	DTA	DTA			DTA	DT	T	T	T				
C2			DT				DT	DT	T	T	DT				
C3			DTA	DTA			DTA				DT				
C4			DTA	TA			DTA	DTA	T	DTA	DTA	T	T	T	T
C5			DTA	DT	DTA	DTA	DT	DT		DT	DTA	DT	DT		
C6			DTA	DT			DT	DT	D	D	DTA	D	D	D	D
D1	D	D	DTA	DTA	D	D	D	D	D	D	D	D	D	D	D
D2	D	D	DTA				DT	D			DTA		D		
D3			DTA				DTA	D		D	DT	D	D		
D4			DTA				DTA	DT		D	DT				
D5	D	D	DTA		DT	DT	DT	DT	D	D	DT	D	D	D	D
D6			DTA	D			DTA	DT			DT				

Mapping of courses against programme learning outcomes (Level 4)

T = taught, D = developed, A = assessed, X = all

Module Title	Engineering Mathematics 1	Engineering Mathematics 2	Principles of Engineering Science 1	Principles of Engineering Science 2	Engineering Practice and Design 1	Engineering Practice and Design 2	Surveying and Structures 1	Surveying and Structures 2	Soil Mechanics	Environmental Engineering	Structural Design	Engineering Ethics
Level	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**
PLO	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**
A1	TDA	TDA					TDA	TDA	DA	DA	TDA	
A2			TDA	TDA			TDA	TDA	TDA		TD	D
A3			TDA	TDA			TDA	TDA	TDA	TDA	TDA	
A4					TD	TD				D	TDA	TD
A5					TDA	TDA					TD	D
A6			TDA	TDA					TDA		TDA	D
A7					TD	TD						TD
A8					TD	TD				D		TDA
A9					TD	TD				DA	D	D
A10					TD	TD				D	TD	TD
A11					D	D				D	D	TD
B1	TDA	TDA	TDA	TDA			DA	DA	DA	D	TD	
B2			TDA	TDA			TDA	TDA	TA	TA	TDA	D
B3											TDA	
B4							TDA	TDA	TDA	TDA	TD	
B5											D	
B6												D
B7										DA	DA	
B8												
C1					TDA	TDA			TDA			
C2					TDA	TDA						
C3					TDA	TDA			TDA			
C4					TDA	TDA			DA		DA	D
C5					TD	TD					TD	D
C6					TDA	TDA						
C7					TD	TD			D	D	D	D
C8					TDA	TDA					D	D
C9												
C10							TDA	TDA				
D1					TDA	TDA			TDA	DA	DA	DA
D2	DA	DA					DA	DA	DA	D	DA	
D3	D	D	D	D	TD	TD			D	D	D	D
D4	DA	DA	DA	DA	DA	DA	DA	DA	DA	DA	D	D
D5					TDA	TDA				D	D	D
D6					D	D	DA	DA	D		D	D
D7									TDA	DA	D	D
D8					T	T					T	T

Mapping of courses against programme learning outcomes (Level 5)

T = taught, D = developed, A = assessed, X = all

Module Title	Advanced Engineering Mathematics	Theory of Structures	Hydraulics	Design and Construction 1	Design and Construction 2	Infrastructure and Highway Engineering	Structural Mechanics	Civil Engineering and Construction Field Study	Advanced Structural Analysis and Design	Engineering Management and Economics	Civil Engineering Drawing and Surveying	Internship
Level	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
PLO	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**	**10/3**
A1	TDA	DA	DA	TDA	TDA		TDA		TDA		TDA	
A2		TDA	TDA	TDA	TDA		TD		TD		TDA	
A3		TDA	TDA	TDA	TDA		TDA		TDA		TDA	
A4				D	D	D	TDA	D	TDA		D	
A5				TDA	TDA	D	TD	D	TD	D		
A6		T A	TDA	TDA	TDA	TDA	TDA	TDA	TDA			
A7						TDA		TDA		TDA		
A8				D	D	TDA		TDA		TD		TDA
A9				D	D	TD	D	TD	D	D		D
A10				D	D	TD	TD	TD	TD	TDA	D	TD
A11				D	D	TDA	D	TDA	D	D	D	TD
B1	TDA	DA	DA	TDA	TDA		TD		TD		DA	
B2		TDA	T A	TDA	TDA		TDA		TDA	D	TDA	D
B3							TDA		TDA	D		
B4			TDA	TDA	TDA		TD		TD	D	TDA	
B5							D	D	D	DA		
B6								DA		DA		DA
B7				TDA	TDA	D	DA		DA			
B8						DA						
C1		TDA	TDA									
C2		TDA									TDA	
C3		TDA	TDA								DA	DA
C4		TDA	DA				DA		DA	TDA	DA	TDA
C5							TD		TD	TDA	D	TDA
C6				TDA	TDA	DA		DA			DA	D
C7			D	D	D	D	D	D	D	D	D	D
C8				TDA	TDA	D	D	D	D	TD	D	D
C9								TDA		TDA	D	TDA
C10											TDA	
D1		DA	TDA	TA	TA		DA		DA	TDA		TDA
D2	DA	DA	DA	TDA	TDA		DA		DA	TDA	DA	D
D3	D		D	D	D	TD	D	D	D	TDA	DA	TDA
D4	DA		DA	DA	DA	TDA	D	DA	D	D	DA	D
D5							D		D	TDA	D	D
D6			D			TDA	D	TDA	D	D	DA	DA
D7		TDA	TDA	DA	DA		D		D	D	D	DA
D8				D	D	D	T	D	T	D	D	D

Mapping of courses against programme learning outcomes (Level 6)

T = taught, D = developed, A = assessed, X = all

Module Title	Project	Structural Design and Analysis 1	Structural Design and Analysis 2	Geotechnical Engineering	Innovation, Enterprise and Management	Engineering System Design	Civil Engineering Materials	Foundations	Engineering Research Methods	Construction Management	Current Topics in Civil and Construction Engineering
Level	6	6	6	6	6	6	6	6	6	6	6
PLO	20/6	10/3	10/3	10/3	10/3	10/3	10/3	10/3	10/3	10/3	10/3
A1	D	TDA	TDA	DA				TD	TDA		D
A2	D	TDA	TDA	TDA		TDA	TDA	TDA			D
A3	TDA	TDA	TDA	TDA		D		TDA			D
A4	DA	DA	DA		D		D	D	DA	D	TDA
A5	TDA	DA	DA	TDA		TDA					D
A6	DA	DA	DA	TDA			TBA	TD			
A7	D				D					TBA	
A8	D	D	D	D		TDA					TDA
A9	D	D	D	DA		DA	TD	TD		TD	D
A10	DA	D	D	DA	TDA	DA					TDA
A11	D	D	D	D		D	D	D	D		D
B1	TDA	DA	DA	D				TDA	DA		
B2	DA	TDA	TDA	TDA	D	DA			DA		
B3						TDA	TDA	TDA	D		D
B4	DA	DA	DA	TDA	DA	DA	TDA	TDA	D		D
B5	TDA								TDA		D
B6	TDA					DA			TDA		
B7	TDA	T A	T A	D	TDA		TDA	TDA			TD
B8	DA	TDA	TDA		TDA	DA	TD	TD			TD
C1	DA	TDA	TDA			DA			D		
C2	DA	TDA	TDA				TDA		DA		
C3	DA	TDA	TDA				TDA	TDA	TDA		
C4	TDA	TDA	TDA			DA	DA	DA	TDA	DA	TDA
C5	DA	DA	DA				DA	DA	TDA		TDA
C6	DA	DA	DA			DA	DA	DA			
C7	D	D	D	DA	D	D	D	D	D	D	D
C8	D	D	D	DA		D	D	D	D	D	D
C9	TDA					TDA			D		
C10											
D1	DA			DA					TDA	D	D
D2		TDA	TDA	DA				D	DA		
D3	DA	D	D	D			D	D	D		D
D4	TDA	D	D	DA	DA		D	D	D	TDA	D
D5	D			D	D		D	D	D	D	D
D6				D		DA			D	TD	D
D7	DA	TDA	TDA	DA	TDA	D			DA		D
D8	DA	D	D	DA	DA	D	D	D	D	D	D

B.Eng. (Hons) Civil and Construction Engineering
Modules Brief Descriptions

CIV 411 Engineering Mathematics 1

This module consolidates the mathematical skills that underpin the B.Eng. engineering degrees.

CIV 412 Engineering Mathematics 2

This module consolidates the mathematical skills that underpin the B.Eng. engineering degrees. **(Prerequisite: CIV 411)**

CIV 413 Principles of Engineering Science 1

This module develops the students' understanding of essential scientific principles for the study of engineering to degree level. It is designed to be accessible to students with a wide range of prior science specialisation. The subject comprises two blocks of study, common to all engineering disciplines. This module introduces the principles of measurement systems and units, and thermal physics.

CIV 414 Principles of Engineering Science 2

This module develops the students' understanding of essential scientific principles for the study of engineering to degree level. It is designed to be accessible to students with a wide range of prior science specialisation. The module comprises two blocks of study, common to all engineering disciplines. This module introduces mechanical and electrical principles, and engineering materials and their properties. **(Prerequisite: CIV 432)**

CIV 422 Engineering Ethics

This course introduces the theory and the practice of engineering ethics using a multi-disciplinary and cross-cultural approach. Theory includes ethics and philosophy of engineering. Historical cases are taken primarily from the scholarly literature on engineering ethics, and hypothetical cases are written by students.

CIV 431 Engineering Practice and Design 1

The module covers design activities, sustainable development principles, and transferable skills.

CIV 432 Engineering Practice and Design 2

The module covers practical work, project management, health and safety and risk management, and transferable skills. **(Prerequisite: CIV 431)**

CIV 441 Structural Design

This module develops students' practice with structures into the design of concrete, steel and timber elements and structures using hand and computer methods. Recycling of

materials, whole life costing, sick buildings are covered and the safety of building work during construction including CDM Regulations are addressed. CAD skills are developed further from Design and Practice. RC detailing is introduced. Hand drawing and freehand sketching skills are taught.

CIV 451 Soil Mechanics

This module introduces a number of simple models which are used to describe soil and its mechanical behaviour. Standard laboratory tests carried out and soil properties derived from the results.

CIV 461 Surveying and Structures 1

This module introduces students to principles of surveying, and setting out, including distance and angular measurements, levelling, volume and curve calculation, dimensional control and positioning. The students will use various surveying instruments including tapes, levels, Theodolite/Total Stations. The students are also introduced to modern advances in surveying technology such as GPS and LASERS and their uses in civil engineering and construction. Knowledge is acquired through computational exercises and completion of practical survey work.

CIV 462 Surveying and Structures 2

This module covers the fundamentals of structural mechanics and strength of materials and numerous worked examples are used to complement the understanding. Students are taught methods of calculating section properties, shear force and bending moment diagrams, and stresses arising from axial, bending, shear and tensional loads on determinate structures. A computer-aided analysis package is introduced. **(Prerequisite: CIV 461)**

CIV 471 Environmental Engineering

This module takes the principles of environmental engineering and applies them to practical applications of analysis and design. The student will be introduced to the principles of water quality, and basic water and wastewater treatment processes, and consider sustainability issues. The student will develop an understanding of the hydrological cycle and surface hydrology, and apply these principles to the calculation of precipitation and unit hydrograph. The student will also learn basics of groundwater flow, and the problem of contamination in groundwater. The unit also introduces air pollution and noise pollution.

CIV 511 Advanced Engineering Mathematics

This module covers advanced undergraduate engineering mathematics.

CIV 521 Engineering Management and Economics

This module helps to prepare the student for their future role as professional engineers in a number of ways. It includes:

- detailed study of project planning techniques, including network techniques, with preparation for the students' individual projects
- an overview of the business functions which interact with engineering
- an introduction to Systems Thinking. A formal method for studying systems will be introduced.
- an introduction to recruitment, retention and equal opportunities in employment
- the use of published Standards in engineering
- use of the BSI website to access national and international standards
- an introduction to statistics and their use in managing engineering processes
- an introduction to Quality Management, with particular reference to the ISO 9000 series
- An introduction to European Directives and harmonised standards
- Writing technical business reports, including the importance of acknowledging published sources and the use of formal methods for doing so.

CIV 531 Internship

This course provides the students with an opportunity to experience the industrial world and be part of a team working on the real-world project. The University assists each student to find the most suitable industry.

CIV 533 Design and Construction 1

This module covers reinforced concrete structures design to Eurocodes, analysis of structural form and ability in design in both qualitative and quantitative directions.

CIV 534 Design and Construction 2

This module covers steel structures design to Eurocodes, analysis of structural form and ability in design in both qualitative and quantitative directions. **(Prerequisite: CIV 411)**

CIV 535 Civil Engineering and Construction Field Study

The module introduces students to the practical side of the civil and construction engineering industry. It gives them the opportunity to visit sites. It ensures that students are aware of real-life situations in projects. Students will be able to critically appraise and evaluate construction management situations and report on them.

CIV 541 Theory of Structures

Students are introduced to the concept and calculations of stresses and strains arising

from a combination of load applications – axial, shear, bending, torsion, combined axial and bending. The state of two-dimensional stress at a point is covered here, together with the concept of complex and principal stresses. Determination of deflections determinate and indeterminate structures will be covered in this unit. Various methods of analysis are introduced and developed: energy methods, numerical approximations (moment distribution) and force method. The plastic theory of analysis for beams is covered here. Modes and calculations for column instability are presented. Failure criteria due to combined loadings are also covered. Finally, the student is introduced to the use of computer-aided analysis using commercial software.

CIV 542 Structural Mechanics

Students will learn Shear stresses in beams; shear centre; combined stresses; torsion in non-circular sections; unsymmetrical beam bending; stress transformations; introduction to tension Analysis using stress and strain tensors; Failure theories; Deformation analysis; Approximate analysis of statically indeterminate structures.

CIV 543 Advanced Structural Analysis and Design

This module covers yield line and strip theory, dynamics of multi-degree of freedom systems, analysis of buildings for earthquake loads, analysis of buildings for wind loads, detailing for ductility, tall buildings and approximate analysis of tall structures.

CIV 561 Civil Engineering Drawing and Surveying

This module covers construction drawings, use of CAD or BIM software to produce structural engineering drawings in concrete and steel. It also covers interpreting drawings for structures, roads and drainage. Additionally, it covers theory and practice in the use of surveying instruments as applied to Civil Engineering and construction projects, calculations and survey techniques.

CIV 571 Hydraulics

This module develops the fundamental principles of Fluid Mechanics and applies them to practical applications of analysis and design. The student will develop a greater understanding of the flow of ideal and real fluids and will apply these principles to the analysis and design of pipes and open channels. The student will perform simple laboratory tests and prepare a formal report.

CIV 581 Infrastructure and Highway Engineering

This is substantially a project-based module. It brings together construction, design, contractual, planning, management and safety processes. It emphasises the link between materials and site geological properties and their relationship with design and execution. Highway engineering will occupy half the contact time and this will include geometric and structural design aspects which will integrate some geology, earthwork and drainage. The module will also include site visits.

CIV 621 Innovation, Enterprise and Management

The module is intended to be practical, with students developing some appropriate ideas of their own in such a way that they become practical, profitable propositions. Students will practice ways of finding ideas, testing those ideas and developing them, and will write their own business strategies, risk assessments and scenario testing so that they demonstrate the commercial viability of their ideas.

CIV 631 Engineering Research Methods

The module studies the scope and significance of engineering research. It introduces students to the various aspects of engineering research; its types, tools and methods and students will learn how to apply research techniques to real-world situations. The module covers areas such as the identification of a topic by the student, proposition of hypothesis, formulation of research inquiries, development of literature review, selection of research design and methodologies. Additionally, students will learn data collection techniques; primary and secondary data collection with application to specific problems, scaling and research instrument design and sampling design.

CIV 632 Engineering System Design

In this module, the student will learn the process of engineering project development from planning to detailed design working in project team under the supervision of the lecturer. **(Prerequisite: CIV 534)**

CIV 633 Construction Management

This module prepares students with the ability to critically appraise and evaluate the performance of the construction industry and shed light on the role of construction management.

CIV 634 Current Topics in Civil and Construction Engineering

The module introduces students to new issues, ideas and trends in the civil and construction engineering industry. It ensures that students are kept up-to-date with developments. Topics students will experience will include Building Information Modelling, 3D Printing, smart buildings and cities, modular construction, plastic roads, sustainability issues, and other related matters.

CIV 635-Project

In this module, students must plan, execute, review and report upon a piece of project work related to the B.Eng. course being followed by the student. A module guide for the project is augmented by 8 lectures.

CIV 641 Structural Design and Analysis 1

This module builds on the previous studies in structures. The moment distribution

method for beams and frames is introduced. The plastic analysis of beams, frames and slabs is covered. The matrix stiffness method is outlined using computer software. There is a brief introduction to the dynamic analysis of structures. **(Prerequisite: CIV 561)**

The module extends the students' knowledge of material use, analysis of structural form, and ability to design in both qualitative and quantitative directions. Problems from the IStructE Part 3 papers are selected so that students can develop their analytical confidence to choose appropriate structural forms and materials and support their choice in critical peer review.

CIV 642 Structural Design and Analysis 2

This module builds on the previous studies in structures. The moment distribution method for beams and frames is introduced. The plastic analysis of beams, frames and slabs is covered. The matrix stiffness method is outlined using computer software. There is a brief introduction to the dynamic analysis of structures. **(Prerequisite: CIV 641)**

The module extends the students' knowledge of material use, analysis of structural form, and ability to design in both qualitative and quantitative directions. Problems from the IStructE Part 3 papers are selected so that students can develop their analytical confidence to choose appropriate structural forms and materials and support their choice in critical peer review.

CIV 643 Civil Engineering Materials

The module provides an overview of general civil engineering material performance requirements and properties: strength, stiffness, durability, and appearance. This will include concrete, steel, and timber. The module will provide an overview of available materials, geotextile functions and mechanisms, designing with geotextiles; stresses in materials and biaxial stress systems.

CIV 651 Geotechnical Engineering

This module introduces the theories of soil mechanics and their applications to the solution of a number of geotechnical analysis and design problems. **(Prerequisite: CIV 451)**

CIV 652 Foundations

This module covers shallow foundations design. Bearing capacities of soils, safe, net and ultimate; a factor of safety; mass concrete footings; footing resisting lift; column type footings. Two-way footing concentrically or eccentrically loaded; AS 3600 code requirements; design loads; a critical section for shear; punching shear and bending shear, anchor bolts. Combined footings; design of strap or cantilever footings. Design of mat foundations. Design of retaining walls. Design of reinforced retaining walls. Sheet pile walls design. Residential footings design.

ASU

جامعة العلوم التطبيقية

APPLIED SCIENCE UNIVERSITY

BYLAW

ASU Bachelor Degree Bylaw *

Article (1)

This bylaw is called the Bachelor Degree Bylaw in the Applied Science University, and is applicable to all University colleges effective from the date of approval. It is applied to enrolled students that are registered to obtain a Bachelor Degree.

Article (2)

1. The following words and expressions, as indicated in this bylaw, have the meanings allocated below; unless the context signifies otherwise.

A. President: University President

B. Council: University Council

C. College Dean: Dean of the College to which the student belongs

D. Study System: Credit Hours System

2. Credit Hours System:

The system of study is based on:

A. Number of credit hours that should be completed by the student and passed according to the level determined by the University as a condition for graduation in any academic programme.

B. Identification of academic fields in which such credit hours are distributed as per the provisions of this bylaw giving the student the freedom to select required courses based on his/her needs and readiness with the guidance from his/her academic advisor and within the range of minimum and maximum credit hours allowed per semester and according to the advising plan.

3. Credit Hours (Cr.):

Includes one theoretical hour of study per week or its equivalence in practical hours, within the full academic semester.

4. University Year:

The university year consists of two obligatory semesters and one optional summer semester.

5. Semester:

The duration of each semester is at least 14 weeks, including the examination period, and the duration of the summer semester is at least seven weeks, including the examination

* This bylaw applies for all ASU-awarded degrees, put here for information.

period. The University Council is entitled to change this duration as per public interest as viewed by the University Council, in a way that does not conflict with the bylaws and laws issued by the Higher Education Council.

6. University Requirements:
A set of compulsory and elective courses studied by all students in the University according to their approved plan of study.

7. College Requirements:
A set of compulsory and elective courses studied by all students in the College according to their approved plan of study.

8. Programme:
The total credit hours required to be studied by the student to obtain a Bachelor Degree in a certain specialty.

9. Programme Requirements:
A set of compulsory and elective courses studied by all students in the programme according to their approved plan of study.

10. Academic Level:
The academic level of the student is determined by the number of hours the student has passed successfully by virtue of the study plan.

11. Elective Courses:
These are a set of courses from which the student is entitled to select, as included in the elective courses list, and according to the approved plan of study in the University.

12. Compulsory Courses:
A group of courses that the student must complete as part of their approved study plan in the University.

13. Prerequisite:
An academic course that must be successfully completed by the student before enrolling in the more advanced course, according to the provisions of Article 8/2.

14. Study Load:
The number of credit hours registered by the student during the semester.

15. Study Plan:
This specifies the total number of credit hours distributed accordingly throughout the study period in order to obtain a Bachelor Degree.

16. Punctuality:
Attendance of lectures, discussions, and practical classes defined for each course in the study plan.

17. The Academic Advisor:

An Academic Staff who helps the student register the required courses after referring to their academic transcript and the study plan provisions, as well as the university bylaws, depending on the student's abilities and academic progress in the University.

18. Course Grade:

The total marks from the final exam, mid-term exam and classroom work, excluding courses that are on a (Pass) or (Fail) basis.

19. Semester Average:

The average of courses grades studied by the student in one semester, calculated to the nearest decimal points.

20. Grade Point Average (GPA):

The accumulative average of all the courses completed by the student, successfully or otherwise, as set in their study plan until the date at which the average is calculated. Courses that are not within the student's study plan are not included in the calculation of the GPA and are calculated to the nearest two decimal places.

21. Minimum Pass Mark:

The Minimum Pass Mark in the course is 50%, and the minimum final mark is 35% (University Zero Mark). This should take into account the fact that the mark should be a single overall integer mark.

22. Transcript:

A copy of the student's academic report, which the student receives at the end of each semester, indicating the number of credit hours studied, mark for each course, semester average and Grade Point Average (GPA).

23. Withdrawal:

- Withdrawal from the course (W)

  This refers to the student's withdrawal from the academic course within the specified period.

- Emergency Withdrawal (WE)

  This refers to the student's emergency withdrawal from all courses after the specified withdrawal period for compelling reasons, such as ill health, personal injury, or the death of a first or second degree relative.

- **Forced Withdrawal (WF)**

  This refers to the student's withdrawal from the registered courses in a certain semester in cases in which he has exceeded the permitted absenteeism percentage without providing an official excuse.

· **Automatic Withdrawal (WA)**

This refers to the student's withdrawal from the registered courses in a certain semester in cases which they have not attended any of the lectures of the course during the semester.

· **Cancel Registration (CR)**

This refers to the cancellation of a student's registered courses in a certain semester in case the misconduct committee issues a decision to cancel the registration.

24. Academic Warning:

A formal warning given to the student in cases where he has low GPA.

Article (3):

The University Council declares the study plan that leads to obtaining of a Bachelor Degree in the specialities provided by the University Department, based on the recommendation of Councils of Colleges and appropriate Academic Departments, as well as proposals from the appropriate committees, so that the credit hours required for obtaining degrees are as follows:

1. College of Administrative Sciences:

A. Bachelor in Accounting	135 Credit Hours
B. Bachelor in Business Administration	135 Credit Hours
C. Bachelor in Accounting and Finance	135 Credit Hours
D. Bachelor in Management Information Systems	135 Credit Hours
E. Bachelor in Political Sciences	135 Credit Hours
F. B.A. (Hons) Management and Business Studies	135 Credit Hours (Hosted)
G. B.A. (Hons) Accounting and Finance	135 Credit Hours (Hosted)

2. College of Law

Bachelor in Law	135 Credit Hours

3. College of Arts and Science

A. Bachelor in Computer Science	135 Credit Hours
B. Bachelor in Graphic Design	135 Credit Hours
C. Bachelor in Interior Design	132 Credit Hours

4. College of Engineering

A. B.Eng. (Hons) Civil and Construction Engineering 150 Credit Hours (Hosted)

B. B.Eng. (Hons) Architectural Design Engineering 150 Credit Hours (Hosted)

Article (4) Study Plan:

The study plan in each Bachelor Degree programme includes the following courses.

1. University requirements:

Number of credit hours needed to meet the University's requirements is 27 Cr., divided as follows:

A. **University Compulsory Requirements: (21) Credit Hours:**

Course no.	Course Name	Credit Hours
ARB101	Arabic Language	3
ENG101	English Language 1	3
ENG102	English Language 2	3
CS104	Computer Skills	3
HBH105	Bahrain Civilization and History	3
BA 161	Introduction to Entrepreneurship	3
HR106	Human Rights	3

B. **University Elective Requirements: (6) Credit Hours:**

One course is to be selected from the first group (3 credit hours) and one course from the second group (3 credit hours).

Group	Course no.	Course Name	Credit Hours
First Group	ISL 101	Islamic Culture	3
	ISL 103	Islam and Contemporary Issues	3
	ISL 102	Islamic Ethics	3
Second Group	SOC 101	Introduction to Sociology	3
	MAN 101	Man and Environment	3
	LIB 101	Introduction to Library Science	3
	SPT 101	Special Topics	3
	CS 205	Computer Applications	3
	LFS102	Thinking & Communications Skills Development	3

C. Other courses may be added, and some of the courses mentioned above may be cancelled by a resolution of the University Council. The council forms a committee for each course, or a number of the required courses. These committees set the courses' curriculum according to the council's guidelines.

2. College Requirements:

The requirements of the College consist of the set of credit hours declared by the University Council, upon a recommendation of the College Council, as follows:

Colleges	Credit Hours
College of Administrative Sciences	27
College of Arts and Science	12 - 21
College of Law	21

3. Requirements of the programme and Supporting Courses:

The number of credit hours required is approved by the University Council upon a recommendation from the councils of colleges. These credit hours are distributed between compulsory and elective courses, as well as applied education and internships.

Article (5): Admissions Requirements and Placement tests for new students

1. University Admissions requirements:

A. The student should obtain a Secondary School Certificate or its equivalent certified by the Ministry of Education in the Kingdom of Bahrain with an average of no less than 60% or equivalent.

B. Students with averages below 60% may be admitted in the University, provided that they meet one of the following criteria:

1. They are athletes and artists who represent the Kingdom of Bahrain internationally.

2. Those with at least one year of practical experience following their secondary school certificate.

3. In addition to that, the University Council has the right to decide on applicants with averages below 60%.

4. The number of students admitted according to this point (B) can be no more than 5% of the admitted students.

C. In some programmes, the students admitted from non-scientific secondary school fields should pass remedial courses.

2. All students admitted to the University should take a compulsory placement test – determined by the University- to determine their English language level. The levels admitted to the programmes are determined as follows, so that the admitted student studies the course listed according to their own ability level:

A. Programmes taught in English according to the following table:

Course	Level	Mark in the placement test
ENG 097	Elementary	34 - 0
ENG 098	Intermediate	50 - 35
ENG 111	Upper-Intermediate	120 - 51

B. Programmes taught in Arabic according to the following table:

Course	Level	Mark in the placement test
ENG 099	Remedial course	40 - 0
ENG 101	English 101	120 - 41

3. A student may be exempted from studying the English language courses in the following cases:

- The student is exempted from the courses ENG 097 and ENG 098 for programmes taught in English, and the course ENG 099 for programmes taught in Arabic if they have obtained (5) or higher in an IELTS test, or 450 and higher in a TOEFL test.
- The English language placement test is conducted in the semester in which the student is admitted. If the student does not attend the test, they will be given a mark of 0, and will not be allowed to postpone the test for any reason or under any circumstances.
- Students transferred from other universities will be exempted from the English language placement test if they have taken an equivalent English course in their previous university.

Article (6): Credit Hours

1- Each course consists of three credit hours, excluding some courses that have practical requirements (for example, laboratory work), in which case, the number of credit hours for a course may reach five hours. The University Council may assign fewer or more hours for some courses, if required.

2- The credit hours for each course are assigned on the basis that one hour of theoretical weekly lecture equals one credit hour. In the case of laboratory or practical hours, the assessment is made separately for each course, where one credit hour constitutes no less than two practical hours or two laboratory hours.

Article (7): Levels of Study

1- The courses offered by each programme as well as the courses included in the study plans are classified into four levels, stating any prerequisites (if any) for each course. Each course is assigned a code that indicates its level. Moreover, every course must identify the number of lectures, weekly laboratory hours, and number of credit hours.

2- The students registered at the University under the Bachelor Degree are classified into four levels: first year, second year, third year, and fourth year, according to the number of credit hours they completed. It should be the case that a second year student has completed 33 credit hours, whereas a third year student will have completed 66 credit hours, and a fourth year student will have completed 99 credit hours.

Article (8): Prerequisites

1. The student is not allowed to study a course before studying its prerequisite courses.

2. The student is allowed to study a certain course and its prerequisite in the same semester if their graduation so requires, or if they have previously failed the prerequisite. This happens with the consent of the Dean of the College and with a recommendation from the Head of the Department and the academic advisor, provided that the student does not have more than one prerequisite to complete or to pass.

3. The meaning of studying a prerequisite which is mentioned in paragraphs 1 and 2 of this article: -the student should have registered, attended and taken the exams of the prerequisite irrespective of passing or failing it, provided that his grade is not less than 36%.

Article (9): Duration of Study:

1. The study duration to obtain a Bachelor Degree in any programme with a regular study load is four academic years.

2. Students are not allowed to obtain a Bachelor Degree in a period of less than three years.

3. The study duration to obtain the Bachelor Degree should not exceed eight academic years in all programmes.

Article (10): Study Load

The minimum number of credit hours a student may register for is 12 credit hours per semester, and the maximum is 19 credit hours per semester. A student is allowed to register less than 12 credit hours only once during his studies. Moreover, he is allowed to register less than the aforementioned minimum number of credit hours more than once on condition that he is considered a part-time student and that it should not count

towards the minimum period of obtaining the degree. A student is allowed to register for extra credit hours, provided that these hours do not exceed 21 credit hours, and the following conditions are met:

- His GPA is not less than 84%.
- The student needs to study 21 credit hours to complete the requirements of graduation during that semester.

Article (11)

In the graduation semester, the student may register any number of credit hours required for graduation, without considering the minimum level of the prescribed study load.

Article (12): Punctuality

All registered students must regularly attend all lectures and actively participate in all classroom discussions. Furthermore, the course instructor keeps a record of the students' absence and attendance in the Students Information System.

Article (13): Absence and Excuses

1. The student is not allowed to be absent for more than 25% of the course credit hours.
2. The course instructor submits the names of those students whose absenteeism exceeds 15% of the total hours of the course to the Head of the Department in order to take the necessary action.
3. If the student is absent for more than 25% of the total course credit hours without a reasonable excuse that is accepted by the College Dean, they will not be allowed to attend their final exam and will be given the minimum pass mark, i.e. (WF, 35). The student will then have to retake the course, if it is compulsory. In all cases, the grade will be included in the calculation of the student's accumulative and semester average for warning or dismissal purposes.
4. The Head of the Department submits to the College Dean a list of those students who are prohibited from taking the final examinations due to their absenteeism, to inform the Deanship of Admissions and Registration to assign to those students the minimum grade for that course.

Article (14): Absence

1. If the student is absent for more than 25% of the course hours due to illness or any reasonable excuse that is accepted by the College Dean, they will be considered as withdrawn from the course with a grade of (W), and the rules of withdrawal will apply. Students who represent the Kingdom or the University in social activities shall be permitted to be absent for no more than 30% of the total course hours.

2. It is necessary that sick leave be issued by an approved medical authority and a certificate be submitted to the Dean of College within a period of two weeks from the date of the absence.

Article (15): Examinations

1. Any student absent from the final exam without an excuse that is accepted by the College Dean will be given a mark of zero.
2. The maximum number of (stamped) sick leave for out-patient students is five days if approved within two working days, whereas for in-patient students, approval must be sought within four working days from the period of absence.
3. If the student misses the final exam with a reasonable excuse that is accepted by the Dean of the College, the Dean is responsible for informing the Deanship of Admissions and Registration of the need to assign a grade of "incomplete", where the course instructor will schedule a make-up exam within the first 2 weeks of the next semester unless the student has postponed that semester; this rule doesn't apply to the summer semester since it is an optional semester. If this does not happen, the students will not be able to retake the exam, and he/she will be assigned the minimum grade for that course which is (IF, 35).
4. It is possible to consider the student who has missed the final examination with an acceptable excuse as withdrawn from the course, provided that he successfully passed the Mid-Term exam and the coursework, and are not registered for the make-up exam during the period determined in Paragraph 3 above, and that the student did not miss a make-up exam scheduled by the department without providing an acceptable excuse to the Dean.

Article (16): Course Description

Academic Staff members prepare descriptions of their courses, which include the nature of the course, its objectives and timetable, the course requirements, exams and assessment dates, mark distribution, reading and references lists. These will be approved by the Department Council.

Article (17): Marks

1. The final mark for each course is the sum of the final exam mark and the coursework mark.

2. The coursework includes the following:

a) Oral and written quizzes, reports, research, group discussions, presentations and class participation, and counts for 20% of the overall course mark.

b) A mid-term written exam which counts for 30%.

3. The final exam for each course is held at the end of the semester and counts for 50% of the overall mark. The final exam is a written exam that covers the course

material and may include oral or practical tests or a submitted report and the College Council determines, based on a recommendation from the concerned Department, its percentage from the final exam mark. This has to be announced to the student at the beginning of the semester.

4. The distribution of the marks for practical courses, or those which have a practical element, are determined by the College Council based on recommendations by the Department Council.

5. The Final exam, Mid-term exam grades and coursework may be re-distributed if recommended by the Department Council and the College Council and given an approval from the University Council.

6. The marks are calculated and recorded for each course using percentages, and the credit hours of the course should be clearly stated.

7. The final grade for each course is calculated from 100 to the nearest whole number.

Article (18): Examination Questions

The exam questions should be confidential and each academic staff member setting them should coordinate with his Head of Department and College Dean. The academic Staff should take full responsibility for the supervision, printing, copying, packing, and maintaining of the exam papers.

Article (19)

The course instructor is responsible for keeping a record of students' attendance of the exam, and the marking of papers.

Article (20)

The course instructor is responsible for accurately recording the students' marks in the Students Information System.

Article (21)

1. Mark Classifications are as follows:

Mark	Grade	Symbol in English
100% - 90	Excellent	A
89% - 80	Very Good	B
79% - 70	Good	C
69% - 60	Pass	D
59% - 50	Poor	E
Below 50%	Fail	F

2. The Accumulative Averages are classified as follows:

Mark	Grade
92- 100%	Excellent with Honours
less than 92% - 84	Excellent
less than 84% - 76	Very Good
less than 76% - 68	Good
less than 68% - 60	Satisfactory

Article (22): Calculation of Semester and GPA Averages

1. The calculation of any semester or GPA averages is done by multiplying the percentage for each course by the number of credit hours for each course divided by the total number of credit hours.

2. In cases where the student has failed, their mark will be recorded by the course instructor as 35%, including all marks that fall below 35%.

3. All courses completed by the student are documented in their academic transcript.

Article (23): Appeals

1. Students have the right to appeal against their final examination mark for any course within ten days of the results being announced. The Dean is then entitled to investigate whether any mistakes were made in the calculating or recording of marks or unmarked marks. This is done by a committee formed by the College Dean, consisting of academic staff members but not including the course instructor.

2. The student pays 10 Dinars for each appeal request.

3. The student has to right to appeal against his final mark for any course using the following steps:

A. The student submits an appeal request to the Deanship of Admissions and Registration within 10 days of the results announcement. The student then pays 10 Bahraini dinars - to be refunded if the mark is subsequently augmented.

B. The Head of the Academic Department forms a special committee that consists of two academic staff members to review the coursework results and re-mark the final exam paper; provided that the student's course instructor is not a member of the committee. If the committee cannot agree on the same result, it will be transferred to a third member to make the final decision.

C. The committee depends on the mark distribution that was provided by the course instructor.

D. The committee submits its report to the Head of the Academic Department within one week of its formation.

E. If the mark is changed following the committee report, it will be approved by the concerned Head of Department and College Dean. The report will then be delivered to the Deanship of Admissions and Registration to amend the mark prior to end of the Add/Drop period of the coming semester.

F. The Deanship of Admissions and Registration notifies the student of the result.

G. The student is not allowed to request an appeal on a course that was already reviewed. The first appeal's decision will be considered as a final decision.

Article (24): Adding or Dropping Courses

1. The student is allowed to withdraw from courses in which they are registered and add new courses within five working days of the beginning of the first and second semesters, and within three working days of the beginning of the summer semester. The courses dropped within those periods will not be included in the student's academic transcript.

2. Given the content of Clause (1) of this Article, the student is allowed to withdraw from a course within eight weeks of the beginning of the first and second semesters, and within four weeks of the beginning of the summer semester, provided that the student has not exceeded the percentage of the allowed absenteeism rate. The dropped course in this case would be included in the student's academic transcript with a note of 'withdrawn-W', and this course would not be included in the total credit hours they have studied in terms of passing, failing or graduation requirement. If the student has dropped the course after the mentioned period, the academic staff should include the student's result in his academic transcript. The withdrawal process should not decrease the number of credit hours registered by the student in terms of the minimum study load allowed according to these instructions, except in some compelling circumstances mentioned in these instructions.

Article (25): Withdrawal from and completion of courses

1. In cases where the student has withdrawn from a course, the note 'W withdrawn' will appear next to the course on his academic transcript.

2. The note 'incomplete' will appear next to the course if the student does not complete the requirements, or misses the final exam with an acceptable excuse.

3. If the student obtains the result of 'incomplete' in some courses, their averages will be calculated when the marks of the courses are complete. The averages are considered retroactively from the date of the student having obtained the 'incomplete' result, when it comes to academic warning or dismissal.

Article (26): Honorary Board

1. Each semester The President issues the names of students listed in the honorary board of the University. This includes names of students who have obtained semester averages of 92% and above, and the University honours them in a way that it deems appropriate.
2. The Dean places the names of the students who have obtained semester averages of 85% and above on the honorary board of the College, and notes this in their academic transcript, provided their load of study is no less than 12 credit hours.
3. The bylaw of the Honorary Board of the Excellent Students in the Applied Science University is applied to the students listed in the above Clauses 1 and 2.

Article (27): Academic Warning and Dismissal

1. The student is given an academic warning if his GPA is lower than the minimum required level for graduation in the academic programme at the end of any semester, except for his/her first semester at the University, the semester when the student changes his specialization (if it occurs) and also the summer semester; the Deanship of Admissions and Registration notifies the student via the method it deems appropriate.
2. The Student who receives an academic warning should resolve the issues that have caused him/her to be put under probation within a maximum period of three regular semesters after the semester because of which he/she was put under probation.
3. If the student receives an academic warning then was capable to increase his/her GPA to the required minimum, the effects of that warning are cancelled; and if his/her GPA decreases again at a later stage, he/she shall receive a new academic warning different from the previous warning (s).
4. The student who is subject to an academic warning is not allowed to register for more than four courses (12) credit hours in the semester, except with a recommendation from the Academic Advisor and the Head of Department.
5. The student who is given an academic warning is not allowed to participate in any extra-curricular activities held at the University.
6. The summer semester is not taken into consideration for the purposes of academic warning and dismissal, but the academic warning is cancelled if the student's GPA has increased to the minimum required level for graduation in the academic programme according to the result of the summer semester.
7. If the student cannot resolve the issues that have caused him/her to be put under probation, by virtue of Clause (2) of this article, he/she will be dismissed from the academic programme, and maintains the right to move to another academic programme.

8. Any student who has successfully completed 75% of the credit hours required for the academic programme will not be dismissed. The student obtaining a GPA between 59.5% and 59.9% by the end of the third semester of the academic warning will also be excluded from dismissal and, in both cases, the student remains under probation until he/she manages to raise his/her GPA to the minimum required for graduation and is only dismissed if he/she exceeds the maximum permitted study duration in the university.

9. A student who is dismissed from his/her initial academic programme and then denied registration at a new academic programme will be dismissed from the University.

10. The student is not allowed to move to an academic programme from which he/she was dismissed in the past.

11. In spite of the above, every student who exceeds the maximum permitted study duration in the university will be dismissed.

Article (28): Re-taking the Course

1. Student must re-take any of the compulsory courses that he has failed. If a student fails an elective course, he is allowed to study another course according to the study plan. The student is also allowed to re-take any course in which they have obtained a mark below 65%, in order to raise his GPA. In all of the cases indicated, the higher mark will be calculated for the student and the lower mark will be ignored.

2. In cases where the student re-takes a course due to an earlier failure or for any other reason, the credit hours of this course will be calculated only once within the number of hours required for graduation.

3. If the student completes more courses than the required elective courses in their study plan, the courses with the highest grades will be included in the calculation of their accumulative average, taking into account Paragraphs (1) and (2) of this article.

Article (29): Postponement of Study, Drop-out and Withdrawal from the University

1. The student is entitled to submit a postponement request prior to the commencement of the semester and provide reasons to convince the concerned body, according to the following criteria:

A. College Dean: if the postponement required is for a period of one semester and does not exceed four semesters, whether continuous or not.

B. College Council: if the postponement required is for a period exceeding four semesters, and for no more than six semesters, whether continuous or not.

2. A newly admitted or transferred student is not allowed to postpone a semester unless he has already completed one semester at the University (the credit hours of the foundation courses are excluded).

3. The period of the postponement is included in the maximum study duration specified for obtaining the Bachelor Degree.

Article (30): Attendance / Re-registration / Absence and Withdrawal from Courses

1. If the full-time student is not registered at the University for one or more semesters, and does not obtain written consent from the College Dean for the postponement of his study for this period, his admissions will be cancelled.

2. The University Council may re-register the enrolled student if he presents a reasonable excuse that is approved by the Council. After approval, the student may retain their entire previous academic transcript, provided that the postponement period is not more than four academic years and that they will be able to meet the graduation requirements within the permitted period.

3. The University Council, based on the recommendations of the College Council and the Deanship of Admissions and Registration, will determine the study plan for the re-registered student.

4. The student, whose total excused absences exceed (25%) of the credit hours for semester courses, is considered withdrawn from the semester and the note 'Withdrawn W' will appear on their transcript. This semester will be considered postponed.

5. The student may submit a request to the College Dean to withdraw from all courses registered in a specific semester. If approval from the Dean is obtained, that semester will be considered postponed, and the student should submit such a request at least four weeks prior to the date of the final exams.

Article (31): Transfer from one Academic Programme to Another

1. The student may transfer from one programme to another in the University, if there is a suitable vacancy, provided that his secondary school GPA qualifies him to study in such a programme.

2. When the student is transferred to another programme, he may be exempted from any courses of his choice that he completed in the previous programme if they are included in the study plan of the new programme. The marks of such courses are included in the student's semester and GPA average.

3. Each 15-credit-hour course selected, as per the previous clause, is calculated as one semester.

4. Transfer requests will be submitted to the Dean of Admissions and Registration using the prescribed forms.

5. The transferred student receives the same treatment as the new student, for the purposes of postponement, warnings, and dismissal from the programme.

Article (32): Visiting Students

1. The visiting student is enrolled in his original university, but is a temporary student at the Applied Science University and is allowed to study specific courses in a certain semester. After the end of this semester, the University is not obligated to admit or transfer this student to any academic programme.

The conditions for dealing with the visiting student are as follows:

A. The student should be a full-time enrolled student in a university

B. The visiting student should be studying at a recognised university as per the laws and bylaws of the Higher Education Council in Bahrain.

C. The student should be nominated by his original university to study specific courses, and at the end of the semester, his results will be sent to the responsible body in his original university.

D. A vacancy must be available in the courses that the visiting student is applying for.

E. Visiting students are registered after the period of registration and add/drop, and only in those courses that have available seats.

2. Students desiring to study as visiting students in another university, recognised by the national committee for the equalization of certificates by the Ministry of Education of the Kingdom of Bahrain, should obtain prior consent from the Deanship of Admissions and Registration in the University with the subjects to be studied based on recommendations from the relevant academic department. This consent requires a submission of study request in the other university supported by the following documents:

A. Description of the contents of the course to be studied as approved by the relevant body in the external university, to be submitted to the academic department concerned as per the controls declared by the University Council.

B. A letter obtained from the Dean of Admissions and Registration in the University addressed to the relevant body in the host University.

C. The courses studied by the university student appear as "Pass" if the student has obtained a mark of no less than 70%.

Article (33)

If the student has already obtained a Bachelor Degree from the university and college that they are applying to, in another programme, the university may exempt the student from all requirements of the university and college. The student will only be required to complete the new programme requirements. If the new programme is in another college within the same university, the student may be exempt from the university requirements.

Article (34): Transfer from Other Universities

Students may transfer to the University if there are vacancies available, provided that transfer requests are submitted to the Deanship of Admissions and Registration on the dates announced in each semester, and according to the following conditions:

1. Meeting the requirements of the admissions and registration of the University. In addition, the student must have an acceptable secondary school average or its equivalent for the programme to which he is transferred.

2. The student must be transferring from an accredited university, college, or higher education institute that is approved by the Equivalence Committee at the Ministry of Education in the Kingdom of Bahrain. The courses completed by the transfer student will be included in their study plan, provided that the credit hours accumulated from their previous university are no less than the credit hours of their new course in the Applied Science University.

3. They are a full-time student, and evidence of this is provided.

4. The student is not dismissed for disciplinary purposes from their previous university directly before submitting the transfer request.

5. Every 15 credit hours completed by the transfer student is equal to one semester, provided that the course marks are not calculated in the semester and GPA averages.

Article (35): Re-enrolling in the university

1. If a student that has withdrawn from the University desires to re-enrol, a new application should be submitted. In cases where they are applying for the same programme, their academic transcript should be fully kept, provided they complete the graduation requirements as per the study plan applicable upon their return to the University. The previous study period will be calculated within the maximum graduation period. If they are admitted to another department, the provisions of the clause regarding transferring from one programme to another will apply, provided the duration of study in addition to the withdrawal period does not exceed the maximum permitted graduation period.

2. The student academic transcript will not be considered if the student postpones his study for four or more years.

3. In all cases, the student should study at least 1/3 credit hours with the Applied Science University.

Article (36): Requirements to obtain a Bachelor Degree

The Bachelor Degree is granted to students by the University Council after completion of the following:

1. Successfully passing all courses required for graduation in the study plan

2. Obtaining a GPA of no less than 60%

3. Spending the minimum duration required for graduation and not exceeding the maximum duration, as indicated in Article (9) of this bylaw

Article (37): Course Equivalence

The conditions for transferring courses in cases where a student has transferred from a Higher Education Institution to the Applied Science University:

1. The number of credit hours transferred should not exceed 66% (2/3rds) of the Bachelor Degree requirements, where the minimum study duration for a transferred student is two academic semesters and a minimum of 30 credit hours. Courses with a grade less than C are not transferred.

2. The number of credit hours required in order to be transferred cannot be less than the number of the credit hours of the equivalent course.

3. The course is equivalent to only one course.

4. An official and approved academic transcript is required to verify the student's successful completion of the course.

Article (38): Issuing the Graduation Certificate

The graduation certificates are awarded upon the completion of the requirements at the end of each semester.

Article (39)

1. In cases where the student's graduation is dependent on one or two compulsory courses that are not listed in the semester schedule, or whose timing clashes with another compulsory course, or where the student has failed in the same course twice, the Dean of the College, in consultation with the Head of Department, may allow the student to enrol in an alternative course(s) that is (are) equivalent to the original one(s). The Deanship of Admissions and Registration should be notified accordingly.

2. If the student's graduation depends on one or two elective courses, and the student could not register them for a reason beyond his control, the Dean is entitled to approve the replacement of these courses with other appropriate courses of matching levels from the same or other college upon a recommendation from the concerned Head of Department. The Deanship of Admissions and Registration should be notified.

3. In all cases, whether the matter is related to compulsory and/or elective subjects, the number of alternative courses should be no more than two courses.

4. If the student did not register for a compulsory or elective course because it was not offered or because it clashed with another course, they are allowed to register for an equivalent course upon the recommendation of the Head of Department and the approval of the Dean.

Article (40)

1. The Head of Department and the Academic Advisor are responsible for following up the academic status of the students in co-ordination with the Deanship of Admissions and Registration, and to examine their fulfilment of the graduation requirements.

2. Any student who is expected to graduate at the end of any semester must fill out a graduation form with their department a semester before their graduating semester. This happens in coordination with the Deanship of Admissions and Registration in order to avoid any unexpected mistakes.

Article (41)

The student must obtain a No Liability certificate from the University in order to complete their graduation procedures.

Article (42)

The student does not have the right to claim that they were not aware of these bylaws, University announcements, or anything published on the University noticeboard regarding these instructions.

Article (43)

The Bachelor Degree bears the due date.

Article (44)

1. The student must pay the tuition fees and any required deposit at the time of their registration in each semester. The student registration will not be completed unless they pay all the required fees. The University has the right to amend the amount of fees and deposits required as it deems appropriate, after obtaining the approval of the responsible bodies.

2. Newly-admitted students who have applied to the University immediately after their graduation from secondary schools are entitled to a discount in their first semester. This discount relates to tuition fees only. Other fees such as books fees are excluded:

A. 30% for students who have obtained a GPA 95% and above.

B. 15% for students who have obtained a GPA 90-94.99%.

3. Tuition fees paid by students are as follows

A. Tuition fees per credit hour for students in bachelor's degree programmes in each of the following colleges:

1. College of Administrative Sciences

N°	Programmes	Credit Hours	Fees per Credit Hour
1	Bachelor's Degree in Accounting	135	BHD 92.700
2	Bachelor's Degree in Business Administration	135	BHD 92.700
3	Bachelor's Degree in Accounting and Finance Sciences	135	BHD 92.700
4	Bachelor's Degree in Management Information Systems	135	BHD 92.700
5	Bachelor's Degree in Political Sciences	135	BHD 92.700

2. College of Law

N°	Programmes	Credit Hours	Fees per Credit Hour
1	Bachelor's Degree in Law	135	BHD 92.700

3. College of Art & Science

N°	Programmes	Credit Hours	Fees per Credit Hour
1	Bachelor's Degree in Computer Science	135	BHD 92.700
2	Bachelor's Degree in Graphic Design	135	BHD 92.700
3	Bachelor's Degree in Interior Design	132	BHD 92.700

4. Hosted Programmes

Hosted Programmes from Cardiff Metropolitan University			
N°	Programmes	Credit Hours	Fees per Credit Hour
1	B.A. (Hons) Management and Business Studies	135	BHD 160
	B.A. (Hons) Accounting and Finance	135	BHD 160

Hosted Programmes from London South Bank University			
N°	Programmes	Credit Hours	Fees per Credit Hour
1	B.Eng. (Hons) Civil and Construction Engineering	150	BHD 180
	B.Eng. (Hons) Architectural Design Engineering	150	BHD 180

B. Other non-refundable fees:

1) 10 BHD Application fee (paid once)

2) 100 BHD Registration fee (paid once; 110 BHD for Hosted Programmes)

3) 100 BHD Labs' fees per first and second semester for Computer Science, Interior Design and Graphic Design students.

4) 50 BHD labs' fees per summer Semester for Computer Science, Interior Design and Graphic Design students.

5) 5 BHD fees for English language placement test.

6) 5 BHD fees for an official academic transcript.

7) 5 BHD fees for issuing a graduation certificate.

8) 5 BHD fees for a duplicate official academic transcript.

9) 5 BHD fees for issuance student bona fide official student certificate.

10) 10 BHD fees for course equivalence procedure.

11) 10 BHD fees for appealing a final grade per course.

12) 30 BHD Fees for submission of an incomplete exam (a valid excuse should be submitted in accordance with the procedures established in the University Regulations).

13) 5 BHD fees to issue a new ID card or a replacement.

14) 10 BHD for each extra copy of the graduation transcripts and certificate.

15) In cases where a student loses or damages a book borrowed from the University Library, the fee applied is twice the price of the borrowed book

16) 150 BHD graduation fees + graduation certificate Arabic – English + yearly book.

17) 25 BHD graduation robe fees.

4. The newly-admitted student pays 650 BHD non-refundable for seat reservation and it consists of the following fees:

a) 10 BHD one-time fee to submit the application as mentioned in item (1) of paragraph (b) of Article (45) of this Regulation.

b) 100 BHD one-time registration fee as mentioned in item (2) of paragraph (b) of Article (45) of this Regulation.

c) 5 BHD fee to issue a new university ID card and mentioned in item (13) of paragraph (b) of Article (45) of this Regulation

d) 535 BHD part of the tuition fees of the admissions semester.

5. Financial instructions relating to the withdrawal of a student:

a) Enrolled students have the right to withdraw totally or partially during the late registration period and the add/drop period (announced each semester by the Deanship of Admissions and Registration) and without any financial charges.

b) Enrolled students have the right to withdraw totally or partially before the end of the second week of the approved study semester as announced every semester by the Deanship of Admissions and Registration and will have to pay the amount of 25% of the fees of the withdrawn courses, provided that the payment is processed before the approval of the courses by the Deanship of Admissions and Registration and after obtaining official approvals by the concerned parties in the college.

c) Enrolled students have the right to withdraw totally or partially before the end of the third week of the approved study semester as announced every semester by the Deanship of Admissions and Registration and will have to pay the amount of 50% of the fees of the withdrawn courses, provided that the payment is processed before the approval of the courses by the Deanship of Admissions and Registration and after obtaining official approvals by the concerned parties in the college.

d) Enrolled students have the right to withdraw totally or partially before the end of the fourth week of the approved study semester as announced every semester by the Deanship of Admissions and Registration and will have to pay the amount of 75% of the fees of the withdrawn courses, provided that the payment is processed before the approval of the courses by the Deanship of Admissions and Registration and after obtaining official approvals by the concerned parties in the college.

e) In case the student withdraws partially or totally after the end of the fourth week, he shall pay the entire amount of registered credit hours fees.

f) The student has the right to withdraw totally or partially without financial charges from courses that require prerequisites and were registered in the course registration form submitted by the student to the Deanship of Admissions and Registration.

g) The student has the right to withdraw totally or partially from courses that have been equalized later on without financial charges.

h) In case the student wishes to transfer to another programme after the regular add/drop period, he/she shall bear all the financial charges mentioned above.

i) The student has the right to withdraw totally or partially from courses that have been registered beyond the limit allowed by the university and the Bahraini Higher Education Council without financial charges.

j) If the university cancels or withdraws any courses registered by the student at any time, the amount of the paid fees will be credited to his account.

k) The aforementioned regulations related to students' withdrawal do not apply to new students during admissions semester; they are governed by total withdrawal instructions issued by the university during the registration of an academic semester.

Article (46): Hours of Student Activities and Community Engagement

1. Regulations for granting a credit hour to the extracurricular activities and community engagement of students:

A. The credit hour for student activities is an hour granted with a grade of 100% for participation in student activities through, for example, scientific student societies, students clubs, and student council committees, which are not considered to be an academic requirement.

B. The student granted this credit hour should be an effective member of a scientific society, student club, or any authority that cares for student activities, voluntary activities and community engagement, in coordination with Student Affairs.

C. The credit hour is not granted for student activities and community engagement for:

• Students in the orientation programme.

• Students receiving disciplinary action in the same semester.

D. The credit hour for student activities and community engagement counts towards the GPA along with the results of the academic courses at end of each semester through which the activities are practised.

E. The student is granted a maximum of one credit hour during their time of study in the University.

2. The criteria for granting the credit hour to student activities:

A. The eligible student is granted one credit hour if the hours of participation are not less than 30 hours in one semester, as indicated in the forms of activity prepared for this purpose by the Student Affairs Deanship.

B. The activity should be indicated in the University form, Student Affairs Deanship, Colleges, Student Council, Clubs, or Societies, etc.

C. The students should perform well in the activity they are doing as approved by the organised authority and the declaration of the Student Affairs Deanship.

3. Mechanisms for granting the credit hour for student activities and community engagement:

A. The responsible body for the activity fills out a form allocated for the activities that is prepared by the Student Affairs Deanship, so that each student has a file that includes their activities that is kept in the Student Services Office.

B. The Student Services Office records all student performed activities in one form by end of the semester, in coordination with the body responsible for that activity.

C. The responsible body of the activity approves the student activity form and refers it to the Student Affairs Deanship.

D. The Deanship of Student Affairs approves the student activity form, then it is referred to the Deanship of Admissions and Registration before the end of the semester, for auditing and granting of one hour for activity, as per the system. The Deanship of Admissions and Registration is entitled to return the forms to the Student Affairs Dean to be reviewed once more in case of any errors.

E. Student activity and community engagement are not granted retroactively for activity in previous semesters.

Article (47): Amendment to Provisions of the bylaw

The University Council is entitled to amend the provisions of the articles of this bylaw according to recent updates and public interest, and per resolutions that do not reflect the bylaws and resolutions of the Higher Education Council in Bahrain.

Article (48): Instructions not indicated in this bylaw

The University Council settles the cases not provided for in the instructions and in disputes that may arise due to the application of such instructions, so as not to conflict with the bylaws and resolutions of the Higher Education Council. In emergency cases that cannot be delayed, the President of the University replaces the University Council for the settlement thereof.

Article (49): Implementation of the Provisions of this bylaw

The President, Vice Presidents, Academic and Non-Academic Deans are responsible for the implementation the provisions of these instructions.

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