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جامعة العلوم التطبيقية  
APPLIED SCIENCE UNIVERSITY





# University Prospectus

## 2026 - 2027



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# Bridging Programmes





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Scholarships Up To

**35%**

**Bridging Programmes**





# Bachelor in Computer Science (Bridging)

## Programme Details

<b>Final Qualification</b>	<b>Language of Study</b>	<b>Mode of Study</b>
Bachelor Degree	English	Full Time

## Programme Structure

<b>Study Period</b>	<b>Total Credit Hours</b>	<b>Number of Courses</b>
2 Years	63 Credit Hours	21 Courses

## Brief about the Programme

The Bridging Programme is open to students who have completed a diploma or associate degree in related disciplines from the Kingdom of Bahrain or an equivalent qualification from outside the Kingdom, provided that the certificate is accredited by the relevant authorities in the issuing country.

Completion of the Bridging Programme enables students to seamlessly progress into the Bachelor in Computer Science and engage with third-year courses, including Artificial Intelligence, Systems Analysis and Design, Database Development, and Operating Systems.

## Aims of the Programme

1. Graduates will be equipped with technical skills aligned with the needs of the local and regional labour market.
2. Graduates will master various computer-related knowledge and competencies to solve workplace problems and generate new ideas with creativity and innovation.
3. Graduates will be able to apply scientific research methodologies to analyse and interpret computer science results and data.
4. Graduates will engage in effective and collaborative teamwork.
5. Graduates will demonstrate a humanistic and ethical outlook toward their community, respect diversity in occupational and cultural contexts, and enhance awareness of sustainable development.



**Programme Coordinator:**  
 Dr. Oualid Ali

**Office Number:**  
 +973 16036143

**Email:**  
 oualid.ali@asu.edu.bh

**Head of Department:**  
 Dr. Oualid Ali

**Office Number:**  
 +973 16036143

**Email:**  
 oualid.ali@asu.edu.bh



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Study Plan



## Career Paths

1. Software Developer
2. Data Scientist
3. Cybersecurity Analyst
4. Systems Engineer
5. AI/ML Specialist
6. Cloud Solutions Architect
7. Database Administrator
8. Web Developer
9. Mobile App Developer
10. IT Project Manager

## Entry Requirements

1. The applicant must hold an academic qualification (diploma or associate degree) in a related discipline from the Kingdom of Bahrain or an equivalent qualification from outside the Kingdom, provided that the certificate is accredited by the relevant authorities in the issuing country.
2. The applicant's cumulative GPA must not be less than "Good" or its equivalent. Otherwise, the student must either provide evidence of at least one year of relevant professional experience or pass a number of remedial courses according to the specialization.
3. The applicant's previous specialization must qualify them to study in the programme.
4. Students holding qualifications from professional or vocational programmes (National Diploma - ND, Higher National Diploma - HND, or equivalent) are required to pass a number of remedial courses according to the specialization, in addition to HEC compulsory courses where appropriate.
5. The applicant must have obtained an IELTS score of 5.0 or higher, or an equivalent qualification. (Free English-language support will be provided based on the initial OOPT test score)



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## Study Plan

Remedial and Bridging Courses					
No.	Course Code	Course Title	ASU Credit	NQF Credit	NQF Level
1	CSC111	Structured Programming	3	12	6
2	CSC212	Object-Oriented Programming I	3	12	6
3	CSC222	Software Engineering I	3	12	6
4	CSC221	Database Systems	3	12	6
5	CSC215	Data Structures	3	12	7
6	CSC322	Web Based Software Development I	3	12	7

HEC Compulsory Courses					
No.	Course Code	Course Title	ASU Credit	NQF Credit	NQF Level
1	HR106	Human Rights	3	12	5
2	ARB101	Arabic Language	3	12	6
3	HBH105	Bahrain Civilization & History	3	12	6

Programme Study Plan						
No.	Course Code	Course Title	Prerequisite	ASU Credit	NQF Credit	NQF Level
Year 1 – First Semester						
1	CSC304	Artificial Intelligence	CSC212	3	12	7
2	CSC314	Object Oriented Programming II	CSC212	3	12	7
3	CSC321	Systems Analysis and Design	CSC221	3	12	7
4	CSC325	Database Development	CSC221	3	12	7
5	CSC331	Operating Systems	CSC231	3	12	7
6	-	Programme Elective (1)	-	3	12	7
Year 1 – Second Semester						
1	BA161	Introduction to Entrepreneurship	-	3	12	6
2	CSC301	Numerical Analysis	CSC203	3	12	7
3	CSC302	Computational Theory	CSC102+CSC215	3	12	7
4	CSC323	Visual Programming	CSC314+CSC221	3	12	8
5	CSC332	Data Communication and Computer Networks	CSC331	3	12	8
6	-	Programme Elective (2)	-	3	12	7
Year 1 – Summer Semester						
4	CSC441	Internship	CSC321+90 credit hours	3	24	8
Year 2 – First Semester						
1	CSC401	Algorithm Design and Analysis	CSC102+CSC215	3	12	8
2	CSC402	Compilers Design	CSC302	3	12	8
3	CSC425	Graduation Project 1	CSC241+90 credit hours	3	12	8
5	-	Programme Elective (3)	-	3	12	8
Year 2 – Second Semester						
1	CSC426	Graduation Project 2	CSC425	3	12	8
2	CSC435	Ciphering and Computer Security	CSC332	3	12	8
3	CSC436	Mobile Computing	CSC332	3	12	8
4	-	Programme Elective (4)	-	3	12	8
5	-	Programme Elective (5)	-	3	12	8

Programme Elective Courses						
No.	Course Code	Course Title	Prerequisite	ASU Credit	NQF Credit	NQF Level
Group 1						
1	CSC204	Linear Algebra	CSC203	3	12	7
2	CSC305	Operations Research	CSC103	3	12	7
3	CSC326	Mobile Application Development	CSC322+CSC221	3	12	7
4	CSC327	Web Based Software Development II	CSC322+CSC221	3	12	7
5	CSC328	Human computer interaction	CSC222	3	12	7
6	CSC329	Multimedia Systems	CSC322	3	12	7
7	CSC421	Software Engineering II	CSC222	3	12	7
Group 2						
1	CSC312	Programming Language Concepts	CSC314	3	12	8
2	CSC315	Data Mining	CSC304	3	12	8
3	CSC343	Special Topics in Computer Science	DEPT. APPROVAL	3	12	8
4	CSC403	Image Processing	CSC401	3	12	8

## Course Description

### **ARB 101 - Arabic Language**

This course deals with issues related to Arabic grammar and literature. It studies some basic linguistic issues in the vocabulary, morphology, syntax, and semantics of Arabic. It also studies stylistic and literary features through analyzing and discussing some selected texts from the Holy Quran and other literary masterpieces. (Prerequisite: None)

### **BA 161 - Introduction to Entrepreneurship**

This course aims to study the concept of entrepreneurship, to explain its implications and significance, and to provide students with the knowledge and skills necessary to transform ideas into applied entrepreneurial projects in accordance with the rules of founding entrepreneurial projects. Moreover, the course aims to provide students with the core skills of an entrepreneur, starting from establishing the project, choosing the legal formula for it, planning, organizing, marketing, and financing until the whole process is fully managed while enabling students to submit proposals to establish a commercial project and to discuss it at the end of the semester. Finally, the course aims to study practical cases for pioneering projects in the Kingdom of Bahrain. (Prerequisite: None)

### **HBH 105 - Bahrain Civilization & History**

This course deals with the history of Bahrain from 1500-1800. It studies the stages of the Portuguese invasion of this part of the world and the international power struggle that erupted after the invasion. It also deals with the ruling of Al-Utuub Tribe of Bahrain and the reign of Al Khalifa as their reign is characterized by propensity, wisdom, freedom, and modern state. (Prerequisite: None)

### **HR 106 - Human Rights**

This course discusses the basic principles of human rights. It acquaints the students with the nature of human rights, their realms, and sources, paying special attention to the international legal provisions concerning human rights included in the following documents: United Nations Charter, International Declaration of Human Rights, International Accord on Civil and Political Rights, International Accord on Social and Economic Rights, International agreement against torture and inhumane, disrespectful punishment, and Protection mechanisms and constitutional organization of public rights and freedoms in the Kingdom of Bahrain. (Prerequisite: None)

## **College Compulsory Courses**

### **CSC 111- Structured Programming**

This course will enable students to gain programming skills. It introduces computer programming methods and emphasis in problem solving on the fundamentals of structured design using the principles of top down problem solving strategy. The topics include: an introduction to computer programming, problem solving steps, program design modelling using pseudocode, algorithms, and flowcharts, also structured programming methods, constructs, and implementation using C++ programming language. (Prerequisite-None)

### Programme Compulsory Courses

#### **CSC 212 – Object Oriented Programming I**

The aim of this course is to explain in detailed the principles of the object-oriented paradigm, provide familiarity with approaches to object-oriented modelling and design, syntax, pointers, files, class, inheritance, object-oriented programming concepts, and characteristics, data types, information hiding, constructors, destructors, friend function and friend class, array of objects, manipulating object, and inheritance (Prerequisite: CSC 111)

#### **CSC 215 – Data Structures**

This course covers advanced data Structures concepts, fundamentals and characteristics of Data structures, Array, Linked list, Stack, Queue, Graph, tree. In addition, student will learn and practice the suitable algorithm to manipulate the required data structure. (Prerequisite: CSC212)

#### **CSC 221 – Database Systems**

This course develops students' detailed knowledge and understanding in database systems. The students will be introduced to traditional files structure problems, database systems concepts, database systems evolution, database types, entity, attributes, relationship, and relationship degree, architecture, modeling methods using ERD, relational algebra, normalization and relational database constraints. SQL data definition and manipulation languages are also covered. (Prerequisite: CSC 212)

#### **CSC 222 – Software Engineering I**

This course provides students with detailed knowledge of the concepts and process models involved in software engineering. Students will learn principles of software engineering, evolving roles of software, software process, software product, process models and advanced models, requirements engineering: gathering, modeling and analysis, architectural design, component- level design, designing class-based components, component-level design for web applications, GUI, user interface design, web applications interface design. (Prerequisite: CSC 141)

#### **CSC 301 – Numerical Analysis**

This course provides students with advanced skills of numerical analysis. Topics include, mathematical preliminaries: computer arithmetic, round-off error, source of errors, solution of equations in one variable: bisection method, fixed point method, false position method, secant method, Newton-Raphson method, interpolation and polynomial approximation, introduction to interpolation, direct methods for solving linear systems of equations, iterative methods for solving linear systems, iterative methods for solving nonlinear systems, and curve fitting techniques. (Prerequisite: CSC 203)

#### **CSC 302 – Computational Theory**

This course emphasizes on advanced knowledge and understanding of computational and theoretical

## Course Description

models. The topics include: concepts of automata, Finite Automata and Regular Expressions, Deterministic Finite Automata (DFA). Minimization of DFA; Non- Deterministic Finite Automata (NFA), Pumping Lemma, Mealy and Moore Machines, Ambiguity in Grammars and Languages. Standard Forms; Chomsky Normal Forms; Greibach Normal Forms, Pushdown Automata, Turing Machine. Computational Theory have direct bearing on practice, such as Automata on circuit design, verifying systems, compiler design, and search algorithms. (Prerequisite: CSC 102&CSC 215)

### **CSC 304 – Artificial Intelligence**

This course provides students with advanced skills of Artificial intelligence (AI). Topics include: principles of intelligent systems, approaches used in AI field, problem solving strategies, knowledge representation and reasoning, uncertainty processing, learning and cooperation. (Prerequisite: CSC 212)

### **CSC 314 – Object Oriented Programming II**

This course provides students with advanced skills of object-oriented programming (OOP). Topics include: programming techniques in designing and implementing an object-oriented program, implementing the characteristics and qualifiers of object- oriented programming to create programs for solving business problems with the application of some data structures using JAVA programming language. Students will gain experience in the application of structured programming in practice and, mirroring professional practice, this will be facilitated largely in a real based environment. Students will learn and practice via teamwork. (Prerequisite: CSC 212)

### **CSC 321 – Systems Analysis and Design**

This course provides students with an advanced knowledge and understanding of the concepts and practice of information systems analysis. The students will gain skills in Information Systems requirements analysis and logical system specifications. The student will also learn several systematic approaches and tools for the analysis process management and techniques that will enable them to analyze systems in a team environment. (Prerequisite: CSC 221)

### **CSC 322 – Web Based Software Development I**

This course provides students with advanced knowledge and understanding of the principles of the context of Web based software development. Topics include: creating a web site using HTML, CSS and JavaScript. Other topics such as, creating tables, page division, inserting animation and multimedia, using/creating templates, managing hosting and its control panel are also covered. (Prerequisite: CSC 222)

### **CSC 323 – Visual Programming**

This course provides students with critical knowledge and understanding of visual programming(C#, Visual C++,VB,...) theories and concepts. The course emphasises on event-driven programming methods, including creating and manipulating objects, classes, and using object-oriented tools. In addition to event

## Course Description

-driven Windows programming, data types, operators, objects and properties, menus, procedures, control structures, database file processing, using human computer interaction principles to enhance user interface design. (Prerequisite: CSC 314 &CSC 221)

### **CSC 325 – Database Development**

The course provides students with advanced knowledge and understanding of the database development topics: practicing the database PL/SQL (Cursors, Triggers, Functions, Procedures...). Also the student will practice Database development tools such as: APEX, Oracle Developer: Forms, Reports and Graphics. (Prerequisite: CSC 221)

### **CSC 331 – Operating Systems**

This course presents and discusses advanced topics of operating systems including: virtual machines, real-time and embedded systems, distributed and parallel processing, file systems, fault tolerance, performance evaluation, management functions (memory, device (I/O), Process) and OS security/protection. (Prerequisite: CSC 231)

### **CSC 332 – Data Communications and Computer Networks**

This course aims at providing students with a critical knowledge and a firm foundation of about data communication and computer networking. A thorough understanding of concepts and mechanisms underlying general telecommunications and networking is essential for students to be able to learn and grasp knowledge about other advanced and specific technologies and architectures. (Prerequisite: CSC 331)

### **CSC 401 – Algorithms Design & Analysis**

Algorithms play the central role of both in science and practice of computing, it focusing on both the underlying mathematical theory and practice considerations of efficiency. This course introduces critical knowledge and understanding of concepts, theories, techniques to support the analysis and design of algorithms. Topics include analysis of algorithm efficiency, problem-solving: analysis and synthesis, analysis criteria, asymptotic growth rates, brute force and exhaustive search, time complexity, Sorting algorithms, graphs and Graph Traversals, Adjacency Matrix, Traversing Graphs, Breadth-first search and Depth-first search. (Prerequisite: CSC 102&CSC 215)

### **CSC 402 – Compilers Design**

In this course, students will develop critical knowledge and understanding of specialist theories, principles and concepts of compilers design, major problems in translation of programming languages, compilation steps, difference among translators, Top- down versus bottom-up grammatical analysis, codes generation, and storage allocation strategies. It includes the building of translators, identifies and explores the main issues of the design of translators, lexical analysis, parsing, symbol tables, declaration, code generation, and optimization techniques. (Prerequisite: CSC 302)

### **CSC 425 – Graduation Project 1**

## Course Description

In Graduation Project (1, 2), student critically applies the accurate IT project development methodologies to develop either a software system with accompanying report or a comprehensive IT research report based on the research activity undertaken - oriented to real life problems.

In this course (Graduation Project 1), the student identifies specific problem (define the research questions), conducts a literature survey, analysis, and design for the proposed solution (an artifact) to the identified problem utilizing computer algorithms, software packages and/or hardware devices. This gives the opportunity for individual student, to take the responsibility of executing applied research in the CSC426- Graduation Project 2 with guidance from a supervisor. At the end of this course, the student will demonstrate the outcome of the project and will submit part one of graduation project report. (Prerequisite: CSC241&90 credit hours)

### **CSC 426 – Graduation Project 2**

In this course, the student has to use the outcomes of CSC425 Graduation Project 1 to implement and test the proposed solution. This will take place with guidance from a supervisor. At the end of the course, the student has to demonstrate the project findings and submit a complete graduation project report. Student will use knowledge and skills gained in earlier studied courses and implement them in this phase. Students will be required to plan their work and meet deadlines, they also need to demonstrate the outcome of their IT research/ software system and write a comprehensive report. (Prerequisite: CSC 425)

### **CSC 435 – Cipherring and Computer Security**

In this course, students will be provided with a critical knowledge and understanding of algorithms and protocols from modern cryptology, computer security and secure communication, and equip the student to apply this theory to the problems of building secure applications. The topics of the course include: computer security concepts, security attacks, security services, security mechanisms, symmetric and asymmetric ciphers, block ciphers, DES, AES, block cipher operation, message confidentiality, public- key cryptography and message authentication, the RSA algorithm, Diffie-Hellman key exchange, key distribution, hash functions and user authentication. (Prerequisite: CSC 332)

### **CSC 436 – Mobile Computing**

This course will provide students with both broad and in-depth knowledge, and a critical understanding of mobile computing and mobile communication from different viewpoints: infrastructures, principles and theories, technologies, and applications in different domains. In this course, the following topics will be discussed: basic issues in mobile computing, mobile communications, wireless networks, cellular network and architectures, communication protocols, mobile computing applications, smart phone technology, the application design and environment and the future of mobile computing. (Prerequisite: CSC 332)

### **CSC 441 – Internship**

The internship is a pre-arranged, credit-bearing work experience, which allows a student to achieve personal goals that are aligned with the goals of a supervising professional organisation or agency. Internships provide opportunities to explore career options, test career choices, and encourage the

## Course Description

development of skills within a chosen field. An internship allows students to relate theory with practical job experience as well as develop new skills that will be transferable to future employers. (Prerequisite: CSC321&90 credit hours)

### Programme Elective Courses

#### **CSC 204 – Linear Algebra**

This course provides students with advanced skills of linear algebra to help them develop the ability to solve problems using linear algebra. This course includes: the study of systems of linear equations, matrices, determinants, vectors and vector spaces, linear transformations, eigenvalues and eigenvectors, and their applications. Linear algebra is a core course in many engineering, physics, mathematics, and computer science programs. Computer software will be used to enhance the learning and teaching of topics and techniques covered. (Prerequisite: CSC 203)

#### **CSC 305 – Operations Research**

Operations Research (OR) provides methodological tools which can support business managers in decisions making covering all aspects (internal and external). The purpose of the course is to provide students with advanced knowledge and some specialized tools to help them understand the operations research and mathematical modeling methods. These methods will help the students to solve problems in different environments that needs decisions. The course teaches the students specialized methods of operations research and applications for optimization problems.

The course cover topics that include: OR models, solving the OR model, linear programming applications, the simplex method and sensitivity analysis, duality and post-optimal analysis, Transportation model, and Network model. (Prerequisite: CSC 103)

#### **CSC 312 – Programming Languages Concepts**

This course focuses on programming languages' specifications and concepts which gives students critical knowledge that they can argue persuasively why a particular language is appropriate or inappropriate for a particular problem. Topics are: Concepts of programming languages, domains, evaluation, environments, syntax formal methods, attribute grammars, binding, scope, types (data, user-defined, record, tuple, list, union, pointer, and reference), arithmetic expressions, operators, conversions, programming statements, subprograms, parameter-passing methods, design issues for functions, user-defined overloaded operators, dynamic scoping, abstract data types, and object-oriented languages. (Prerequisite: CSC 314)

#### **CSC 315 – Data Mining**

This course provides students with advanced knowledge and understanding of Data Mining algorithms and computational paradigms that allow computers to find patterns and regularities in databases, perform prediction and forecasting, and generally improve their performance through interaction with data. The

## Course Description

Data Mining process includes data selection, cleaning, coding, using different statistical and machine learning techniques, and visualization of the generated structures. The course will cover all these issues and will illustrate the whole process by examples. (Prerequisite: CSC 304)

### **CSC 326 – Mobile Application Development**

The course provides students with critical knowledge and understanding of the mobile application development. This course covers key technologies underlying mobile application development. Topics include mobile platforms, GUI design, mobile programming, web services processing, database access and event-driven programming. (Prerequisite: CSC 322 & CSC 221)

### **CSC 327 – Web Based Software Development II**

This course provides students with advanced knowledge and understanding of web applications development. Topics include: web applications development, smart devices and Web design programming languages (i.e. PHP, ASP.NET and others), web hosting, file transfer protocol, control panel for local and remote servers, web development tools (i.e. Word Press, Yii frameworks, Dreamweaver and others) (Prerequisite: CSC 322 & CSC 221)

### **CSC 328 – Human Computer Interaction**

This course focuses on advanced topics in human computer interaction (HCI) development and use. The topics includes HCI analysis, design, implementation and evaluation of interactive computing system for human use; Ergonomics; Components of an interactive system; The Human; Input - output channels, the eye, hearing, touch, smell, taste, movement, memory; The computer: Interacting with computers, Virtual reality concept, Virtual reality for HW/SW, Virtual reality applications. (Prerequisite: CSC222)

### **CSC 329 – Multimedia Systems**

This course provides students with advanced knowledge of multimedia systems. Topics include: multimedia system concepts, Color images and videos, Lossless Compression Algorithms, Lossy Compression Algorithms, Image Compression standards, Basics of digital Audio, Multimedia Network Applications, Internet multimedia content distribution, Multimedia over Wireless and Mobile Networks, Multimedia information sharing and retrieval. (Prerequisite: CSC 322)

### **CSC 343– Special Topics in Computer Science**

This course provides students with critical knowledge and understanding of the concepts and practice of the hottest topics and the latest research or technology in the field of Computer Science. The topic might be different from one run to another; an approval from the computer science department is required to select the course content whenever offering the course. (Prerequisite- Dept Approval)

### **CSC 403 – Image Processing**

This course provides students with critical knowledge of concepts and applications image processing.

## Course Description

Topics include image processing concepts, intensity transformations and spatial filtering, some basic intensity transformation functions, histogram processing image enhancement, image filtering, image restoration, image deblurring and denoising, color image processing, color models, The RGB Color Model, The CMY and CMYK Color, image compression and watermarking and morphological image processing. (Prerequisite: CSC 401)

### **CSC 411 – Computer Graphics**

This course provides students critical knowledge of Computer Graphics. Topics include: concepts of computer graphics. It starts with an overview of interactive computer graphics, Rectangles Using Paths to Draw Line, Transformations scale and translate, Methods: Drawing Ellipses, Rotate Method: Creating a two dimensional system and mapping, then it presents drawing algorithm, two-dimensional transformation; Clipping, filling and an introduction to 3-D graphics. (Prerequisite: CSC 401)

### **CSC 421 – Software Engineering II**

This course is a continuation of the study of software engineering I (CSC222). While “Software Engineering I” focuses on software production topics such as processes, requirements and architectures, Software Engineering II focuses on an advanced knowledge and understanding of a broad set of principles and practices affecting the success and failure of software development. The topics of the course include: Quality Concepts, Reviews, Quality Assurance, Software Testing (Component Level, Integration Level, Specialized Testing for Mobility), Project Management Concepts and Risk Management. The last part of the course will cover the principles of software maintenance, the different strategies for changing software systems and reengineering. (Prerequisite: CSC 222)

### **CSC 437 – Cloud Computing**

The course provides students with critical knowledge and understanding of the cloud computing technologies. Topics include cloud infrastructure, reference model, resource management, programming models, application models, system characterizations, and implementations, deployment of cloud computing systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. (Prerequisite: CSC 332)

### **CSC 438 – Parallel and Distributed Computing**

This course provides students critical knowledge and understanding in theory of parallelism and distributed computing, communication, concurrency, hardware and software features, language features for concurrent and distributed systems, concurrent and distributed algorithms and middleware, coordination, sequential and parallel processing, parallel and scalable architecture, parallel decomposition, multiple simultaneous computations, and parallel computer models. (Prerequisite: CSC 332)



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# BRIDGING PROGRAMMES SCHOLARSHIPS

UP TO  
**30%**

FOR THE FIRST TERM ONLY

College of Arts & Science

**Bachelor in Computer Science**



# BEng (Hons) Architectural Engineering (Bridging)

## Programme Details

### Final Qualification

BEng (Hons)

### Language of Study

English

### Mode of Study

Full Time

## Programme Structure

### Study Period

2 Years

### Total Credit Hours

81 Credit Hours

### Number of Courses

26 Courses

## Brief about the Programme

The Bridging Programme is open to students who have completed a diploma or associate degree in related disciplines from the Kingdom of Bahrain, or an equivalent qualification from outside the Kingdom, provided the certificate is accredited by the relevant authorities in the issuing country.

This programme is designed to align with industry developments, particularly the Engineering Council UK (ECUK) Standard for Professional Engineering Competence (UK-SPEC).

The programme leads to a dual award from the Applied Science University (ASU Bahrain) and London South Bank University (LSBU-UK).

## Aims of the Programme

1. Graduates will be able to pursue successful careers in the architectural engineering industry with a wide range of employers in various countries.
2. Graduates will be equipped for postgraduate study and capable of taking up responsible professional employment in architectural engineering, becoming lifelong learners who appreciate the societal value of architectural engineering.
3. Graduates will develop a broad and in-depth understanding of the key aspects of architectural engineering.
4. Graduates will acquire and develop analytical, problem-solving, and subject-specific skills, as well as the ability to evaluate evidence, arguments, and assumptions to reach sound judgements and communicate effectively.
5. Graduates will gain the academic background required for advanced postgraduate studies and the educational foundation needed to progress toward Chartered Engineer status.



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APPLIED SCIENCE UNIVERSITY



**Programme Coordinator:**

Dr. Ali Sedki



**Office Number:**

+973 16036348



**Email:**

ali.ali@asu.edu.bh



**Head of Department:**

Dr. Rouya Hdeib



**Office Number:**

+973 16036151



**Email:**

rouya.hdeib@asu.edu.bh



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## Career Paths

1. Architectural Engineer
2. Structural Engineer
3. Building Services Engineer
4. BIM Specialist
5. Construction Project Manager
6. Sustainable Design Consultant
7. Urban Development Engineer
8. Design & Planning Engineer
9. Environmental Building Consultant
10. Facility Design Engineer

## Entry Requirements

1. The applicant must hold a diploma or associate degree from the Kingdom of Bahrain or its equivalent from outside the Kingdom, accredited by the relevant authorities in the country of issuance.
2. The applicant's cumulative GPA must be at least "Good" or its equivalent. Applicants with a lower GPA must provide evidence of at least one year of relevant professional experience or pass remedial courses related to their specialization.
3. The applicant's previous specialization must qualify them to study in the programme they wish to join.
4. Applicants holding professional or vocational qualifications (e.g., National Diploma - ND or Higher National Diploma - HND) must pass remedial courses as required by their specialization, in addition to HEC compulsory courses where applicable.
5. The applicant must have an IELTS score of 6 or higher, or an equivalent qualification. (Free English-language support will be provided based on the initial OOPT test result.)



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# Study Plan

HEC Compulsory Courses				
No.	Course Code	Course Title	Credit	Level
1	ASU_S_HUR	Human Rights	0	S
2	ASU_S_ALA ASU_S_ALN	Arabic Language or Arabic Language for Non-Arabic Speakers	0	S
3	ASU_S_BCH	Bahrain Civilization History	0	S

Programme Study Plan				
No.	Course Code	Course Title	Credit	Level
Year 1 – First Semester				
1	ASU_5_SD1	Structural Design 1	10	5
2	ASU_5_AEM	Advanced Engineering Mathematics	10	5
3	ASU_5_GT1	Geotechnics 1	10	5
4	ASU_5_DA1	Design Procedures for Architecture 1	10	5
5	ASU_5_A3D	AutoCAD-3D	10	5
6	ASU_5_EME	Engineering Management and Economics	10	5
Year 1 – Second Semester				
1	ASU_5_SD2	Structural Design 2	10	5
2	ASU_5_BIM	Building Information Modelling	10	5
3	ASU_5_EET	Engineering Ethics	10	5
4	ASU_5_DA2	Design Procedures for Architecture 2	10	5
5	ASU_5_AFS	Architectural Engineering Field Studies	10	5
Year 1 – Summer Semester				
1	ASU_5_ITS	Internship	10	5
Year 2 – First Semester				
1	ASU_6_PR1	Project 1	10	6
2	ASU_6_SA1	Structural Design and Analysis 1	10	6
3	ASU_6_ERM	Engineering Research Methods	10	6
4	ASU_6_ECB	Energy Conservation in Buildings	10	6
5	ASU_6_TDB	Thermodynamics for Buildings	10	6
6	ASU_6_FEC	Forensic Engineering and Conservation	10	6
Year 2 – Second Semester				
1	ASU_6_PR2	Project 2	10	6
2	ASU_6_SA2	Structural Design and Analysis 2	10	6
3	ASU_6_GT2	Geotechnics 2	10	6

4	ASU_6_IEM	Innovation, Enterprise and Management	10	6
5	ASU_6_DPR	Design project	20	6

## **ASU\_5\_SD1 Structural Design 1**

Introduction to stress and deformation of basic structural materials subjected to axial, torsional, bending, and pressure loads. Plane stress, plane strain, and stress-strain laws. Applications of stress and deformation analysis to members subjected to centric, torsional, flexural, and combined loading. Introduction to theories of failure.

## **ASU\_5\_AEM Advanced Engineering Mathematics**

This module covers advanced undergraduate engineering mathematics.

## **ASU\_5\_GT1 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 are derived from the results.

## **ASU\_5\_DA1 Design Procedures for Architecture 1**

Personal student architectural design project embracing design studio and technology studio against a defined brief.

## **ASU\_5\_A3D AutoCAD-3D**

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

## **ASU\_5\_EME Engineering Management and Economics**

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

- Detailed study of project planning techniques, including network techniques, with preparation for the student's 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.

## **ASU\_5\_SD2 Structural Design 2**

This module develops students' practice with structural engineering, introduces structural concepts, and provides an overview of specific techniques for analysing determinate structures, trusses, beams, and frames.

## **ASU\_5\_BIM 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.

## **ASU\_5\_EET Engineering Ethics**

This module introduces the theory and the practice of engineering ethics using a multi-disciplinary and cross-cultural approach. The theory includes ethics and the philosophy of engineering. Historical cases are taken primarily from the scholarly literature on engineering ethics, and hypothetical cases are written by students. Each student will write a story by selecting an ancestor or mythic hero as a substitute for a character in a historical case. Students will compare these cases and recommend action.

## **ASU\_5\_DA2 Design Procedures for Architecture 2**

Personal student architectural design project embracing design studio and technology studio against a defined brief.

## **ASU\_5\_AFS 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 construction-type activity and others, including geological and site visits. Multimedia support will feature in the delivery.

## **ASU\_5\_ITS Internship**

This module provides the student with an opportunity to experience the industrial world and be part of a team working on real-world projects. The University assists each student in finding the most suitable industry.

## **ASU\_6\_PR1 Project 1**

To plan, execute, review and report upon a piece of project work related to the BEng programme being followed by the student. A Module Guide for the project is augmented by four lectures.

## **ASU\_6\_SA1 Structural Design and Analysis 1**

This module offers the knowledge and skills of reinforced concrete design to Eurocodes, analysis of structural form and the ability to design in both qualitative and quantitative directions.

## **ASU\_6\_ERM 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 topics, such as the identification of a topic by the student, proposition of hypothesis, formulation of research inquiries, development of literature review, and select research design and methodologies. Additionally, students will learn data collection techniques; primary and secondary data with application to specific problems, scaling and research instrument design and sampling design.

## **ASU\_6\_ECBEnergy Conservation in Building**

This module will provide students with the ability to quantify the energy available from the sun, wind, sea or river, or 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.

## **ASU\_6\_TDB Thermodynamics for Buildings**

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

## **ASU\_6\_FEC Forensic Engineering and Conservation**

This module uses mainly case studies to develop the principles design by looking at the influence of failures on the evolution of the 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.

## **ASU\_6\_PR2 Project 2**

To plan, execute, review and report upon a piece of project work related to the BEng programme being followed by the student. A Module Guide for the project is augmented by four lectures.

## **ASU\_6\_SA2 Structural Design and Analysis 2**

This module offers the knowledge and skills of steel design to Eurocodes, analysis of structural form and the ability to design in both qualitative and quantitative directions.

## **ASU\_6\_GT2 Geotechnics 2**

This module is intended to provide an understanding of the application of theory to the analysis and design of geotechnical structures.

## **ASU\_6\_IEM 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.

One of the assignments will require students to work in groups, typically to adopt a concept and develop it such that it could be commercially viable and sustainable. This might be a product or a service (such as consultancy or contract management).

Students will experience topics addressing intellectual property, market research, market placement, advertising and finance. They will be expected to reflect on what they can contribute to a group.

## **ASU\_6\_DPR Design Project**

Main architectural design project embracing design studio and technology studio against a defined brief.



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APPLIED SCIENCE UNIVERSITY

# BEng (Hons) Civil Engineering (Bridging)

**Programme Coordinator:**  
Dr. Hamdy Alsayed

**Office Number:**  
+973 16036158

**Email:**  
hamdy.mohamed@asu.edu.bh

**Head of Department:**  
Dr. Rouya Hdeib

**Office Number:**  
+973 16036151

**Email:**  
rouya.hdeib@asu.edu.bh

## Programme Details

Final Qualification

BEng (Hons)

Language of Study

English

Mode of Study

Full Time

## Programme Structure

Study Period

2 Years

Total Credit Hours

81 Credit Hours

Number of Courses

26 Courses

## Brief about the Programme

The Bridging Programme is open to students who have completed a diploma or associate degree in related disciplines from the Kingdom of Bahrain or an equivalent qualification from abroad, provided the certificate is accredited by the relevant authorities in the issuing country.

This programme aligns with the Engineering Council UK (ECUK) Standard for Professional Engineering Competence (UK-SPEC). The curriculum develops core engineering numerical abilities alongside creative and enquiry-based thinking required by employers. Students gain a solid foundation to enter the civil engineering industry with the skills needed to excel in a competitive environment.

The programme leads to a dual award from the Applied Science University (ASU Bahrain) and London South Bank University (LSBU-UK).

## Aims of the Programme

1. Graduates will be prepared for a professional career in the civil engineering industry with diverse employers across different countries.
2. Graduates will be equipped for postgraduate study and to assume responsible professional roles in the construction industry, becoming lifelong learners who appreciate the societal value of civil engineering.
3. Graduates will gain a broad and in-depth understanding of civil engineering principles.
4. Graduates will acquire analytical, problem-solving, and subject-specific skills, including the ability to evaluate evidence, arguments, and assumptions to reach sound judgements and
5. communicate effectively.
6. Graduates will gain the academic qualifications required for advanced postgraduate study and the educational base needed to pursue Chartered Engineer status.



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Rated 5 Stars in the QS Rating System



Ranked 30th in the QS Arab Region University Rankings 2026



Ranked 613 in the QS World University Rankings 2026



Ranked 30+ Worldwide in the Times Higher Education University Impact Rankings

## Career Paths

1. Civil Engineer
2. Structural Engineer
3. Project Engineer
4. Site Engineer
5. Transportation Engineer
6. Water Resources Engineer
7. Environmental Engineer
8. Construction Manager
9. Geotechnical Engineer
10. Infrastructure Consultant

## Entry Requirements

1. The applicant must hold a diploma or associate degree from the Kingdom of Bahrain or its equivalent from outside the Kingdom, provided the qualification is accredited by the relevant authorities in the issuing country.
2. The applicant's cumulative GPA must be at least "Good" or its equivalent. If the applicant's GPA is below the required minimum, they must either provide evidence of at least one year of relevant professional experience or successfully complete a number of remedial courses according to their specialization.
3. The applicant's previous specialization must qualify them to study in the programme they wish to join.
4. Applicants holding professional or vocational qualifications (such as National Diploma - ND, Higher National Diploma - HND, or equivalent) are required to complete a
5. number of remedial courses according to their specialization, in addition to any HEC compulsory courses where applicable.
6. The applicant must have obtained a score of 6.0 or higher in IELTS, or an equivalent qualification. (Free English-language support will be provided based on the initial OOPT test score.)



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# Study Plan

HEC Compulsory Courses				
No.	Course Code	Course Title	Credit	Level
1	ASU_S_HUR	Human Rights	0	S
2	ASU_S_ALA ASU_S_ALN	Arabic Language or Arabic Language for Non-Arabic Speakers	0	S
3	ASU_S_BCH	Bahrain Civilization CHistory	0	S

Programme Study Plan				
No.	Course Code	Course Title	Credit	Level
Year 1 – First Semester				
1	ASU_5_AMM	Advanced Engineering Mathematics and Modelling	20	5
2	ASU_5_FEA	Solid Mechanics and Finite Element Analysis (FEA)	20	5
3	ASU_5_MDM	Machine Drives and Mechatronics	20	5
Year 1 – Second Semester				
1	ASU_5_DAC	Dynamics and Control	10	5
2	ASU_5_TSE	Thermofluids and Sustainable Energy	20	5
3	ASU_5_END	Engineering Design	20	5
Year 1 – Summer Semester				
1	ASU_5_INT	Internship	10	5
Year 2 – First Semester				
1	ASU_6_DSM	Dynamics and System Modelling	20	6
2	ASU_6_PRO	Project	40	6
Year 2 – Second Semester				
1	ASU_6_IAE	Innovation and Enterprise	20	6
2	ASU_6_TTM	Thermofluids and Turbo Machinery	20	6
3	ASU_6_MMT	Manufacturing Systems and Materials Technologies	20	6

## **ASU\_5\_AMM Advanced Engineering Mathematics and Modelling**

This module covers advanced engineering mathematical techniques used for solving engineering problems, including Computational Techniques in Engineering, Vectors, Differential equations, Selected Numerical and Computational methods, Advanced Matrix computation techniques, and Advanced Computational Optimisation and advanced Statistical techniques, including Permutations and combinations. Binomial, Poisson and normal distributions.

## **ASU\_5\_FEA Solid Mechanics and Finite Element Analysis**

This module discusses concepts in the deformation of materials building based on knowledge gained in L3 and L4 modules, where the fundamental principles of solid mechanics are applied to more complex systems. The module will provide basic principles of the finite element analysis (FEA) techniques and their application in structural and stress analysis. The module involves a practical component where students use FEA software to implement the theoretical concepts.

## **ASU\_5\_MDM Machine Drives and Mechatronics**

This module provides the fundamentals of mechanical drives, power transmission systems, microcontrollers and electrical actuation systems. The module has a lab component where students will conduct experiments on mechanical and mechatronic control systems in advanced engineering applications.

## **ASU\_5\_DAC Dynamics and Control**

The module covers dynamics and classical theory. It extends the treatment of dynamics from point masses to rigid bodies and covers a wider scope of applications of the principles of mechanics. The module also deals with applying various mathematical techniques to the study of dynamics and feedback problems. Additionally, various methods of classical control, such as Bode, Nyquist and Root Locus, will be analysed. The module includes a practical component where students conduct experiments in teams, analyse data, and communicate experimental results in written technical reports to improve their knowledge and understanding of basic concepts of automatic control.

## **ASU\_5\_TSE Thermofluids and Sustainable Energy**

This module provides further study of heat transfer, fluid mechanics and thermodynamics over the L4 module on Thermodynamics, where the theory needed to allow an industrial-level analysis of processes is presented. The topics include Steam cycles, Air standard cycles, Refrigeration cycles, Turbulence, Combustion and Heat Transfer, heat equation conduction resistance networks, applications, convection and radiation.

## **ASU\_5\_END Engineering Design**

The first half of this module is designed to extend the student's understanding and ability to appropriately select and then apply a range of design methodologies, computer-aided design tools, and techniques to the solution of engineering design problems. A wide range of problem-solving techniques will be introduced to reinforce the need for a structured approach to engineering design. "Hands-on" experience is offered to the student, including further 2D design work software, with a strong emphasis on 3D parametric modelling and the associated tools widely used in industry.

## **ASU\_5\_INT Internship**

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

## **ASU\_6\_DSM Dynamics and System Modelling**

To provide participants with an appropriate way of visualising the complex interrelationships between various parts of real-world problems; problems that continually change over time and are resistant to corrective action. Therefore, the module provides a solid foundation for developing strategies and managing problems for which conventional reductionist ways of thinking are ineffective. The module is subsequently designed to provide the understanding of the following:

- System dynamics and why use it
- The modelling approach/ processes
- The basic feedback structures
- How to develop a system dynamics model.

Therefore, this module introduces the concepts of system dynamics modelling, including the modelling process, fundamental modes of dynamic behaviour, and the stock-flow-feedback structures that generate them, system mapping tools, and modelling human behaviour. Emphasis will be on examples from the energy and water sectors and aquaculture management, but students will have the opportunity to engage with their real-world problems.

## **ASU\_6\_PRO Project**

The project is a learning experience that enables students to do independent research and bring together many of the concepts they have learned. The work calls for careful planning, critical judgment, engineering competence, and communication skills. Further details are provided in the Individual Project Guide for Students. This guide may be updated from time to time, including information generally on how to plan the project, milestones, important dates, and deliverables. The module will spread over the first and second semesters of Year 4.

## **ASU\_6\_IAE Innovation and Enterprise**

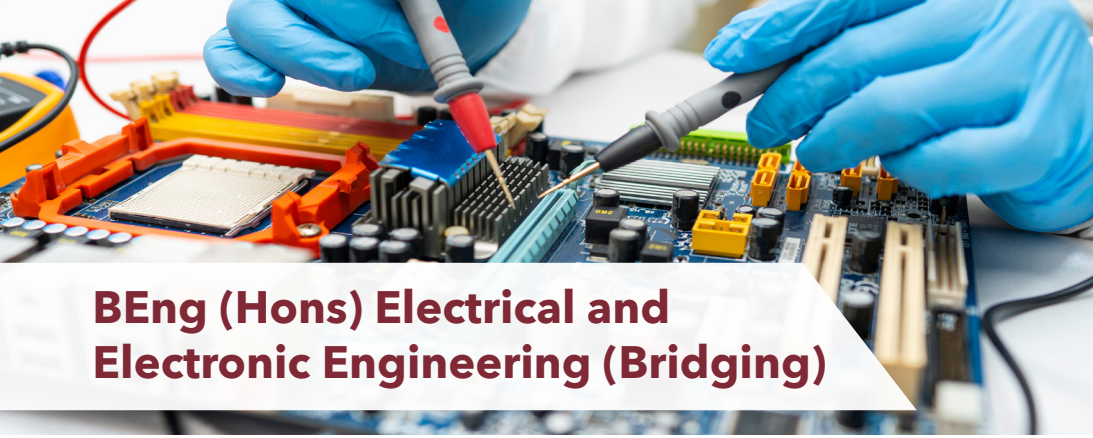
The module is intended to be practical, with students developing some appropriate ideas of their own in such a way that they become practical, profitable propositions. Students will practice ways of finding ideas, testing those ideas and developing them, and will write their own business strategies, risk assessments and scenario testing so that they demonstrate the commercial viability of their ideas. Topics include project management skills which help determine the critical path of a proposed business, such as intellectual property, market research, market placement, advertising and finance. Students will be expected to reflect on what they can contribute to a group.

## **ASU\_6\_TTM Thermofluids and Turbo Machinery**

This module provides a further study of heat transfer, fluid mechanics and thermodynamics, exploring in-depth internal combustion engines, fluid mechanics governing equations, the performance of various types of pumps and turbines, and application of heat transfer to extended surfaces and heat exchangers. The module involves experiments in teams; on condensation apparatus, boiling heat transfer apparatus, central heating system, refrigeration cycle apparatus, weather station, and four-stroke spark-ignition engine.

## **ASU\_6\_MMT Manufacturing Systems and Materials Technologies**

This module provides an advanced study on stress analysis, materials behaviours, and process selection. The module also introduces the core concepts of manufacturing systems, manufacturing and operations strategies, manufacturing automation, manufacturing process planning, material handling storage and retrieval. Students will also develop an understanding of the role of robotics in manufacturing and the principles of operations management.



# BEng (Hons) Electrical and Electronic Engineering (Bridging)

## Programme Details

Final Qualification

BEng (Hons)

Language of Study

English

Mode of Study

Full Time

## Programme Structure

Study Period

2 Years

Total Credit Hours

81 Credit Hours

Number of Courses

15 Courses

## Brief about the Programme

The Bridging Programme is open to students who have completed a diploma or associate degree in related disciplines from the Kingdom of Bahrain or an equivalent qualification from outside the Kingdom, provided the certificate is accredited by the relevant authorities in the issuing country. The programme is designed to reflect developments in the electrical and electronic engineering industry, particularly the Engineering Council UK (ECUK) Standard for Professional Engineering Competence (UK-SPEC). The curriculum emphasises strong numerical and analytical skills, supported by advanced hardware, software, and simulation tools, alongside a creative and enquiry-based approach sought by employers.

The programme leads to a dual award from the Applied Science University (ASU Bahrain) and London South Bank University (LSBU-UK).

## Aims of the Programme

1. Provide graduates with a comprehensive understanding of electrical and electronic engineering.
2. Equip graduates with strong competence in mathematics, circuit theory, digital and analogue systems, hybrid electronic systems, computer hardware/software, and control systems.
3. Enable graduates to analyse electrical and electronic engineering components and systems using advanced simulation techniques and select appropriate analytical approaches.
4. Strengthen graduates' practical skills, including design, measurement, and the use of advanced hardware and software tools.
5. Develop the ability to critically evaluate arguments, assumptions, abstract concepts, and incomplete data to make informed decisions and identify effective solutions.



The first university in the Kingdom of Bahrain to achieve global accreditation from the British Quality Assurance Agency for Higher Education (QAA)

Rated 5 Stars in the QS Rating System

Ranked 30th in the QS Arab Region University Rankings 2026

Ranked 613 in the QS World University Rankings 2026

Ranked 30+ Worldwide in the Times Higher Education University Impact Rankings



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**Head of Department:**

Dr. Malak Naji



**Office Number:**

+973 16036223



**Email:**

malak.naji@asu.edu.bh



**Dean of the College:**

Dr. Mohamed Salama



**Office Number:**

+973 16036273



**Email:**

mohamed.salama@asu.edu.bh



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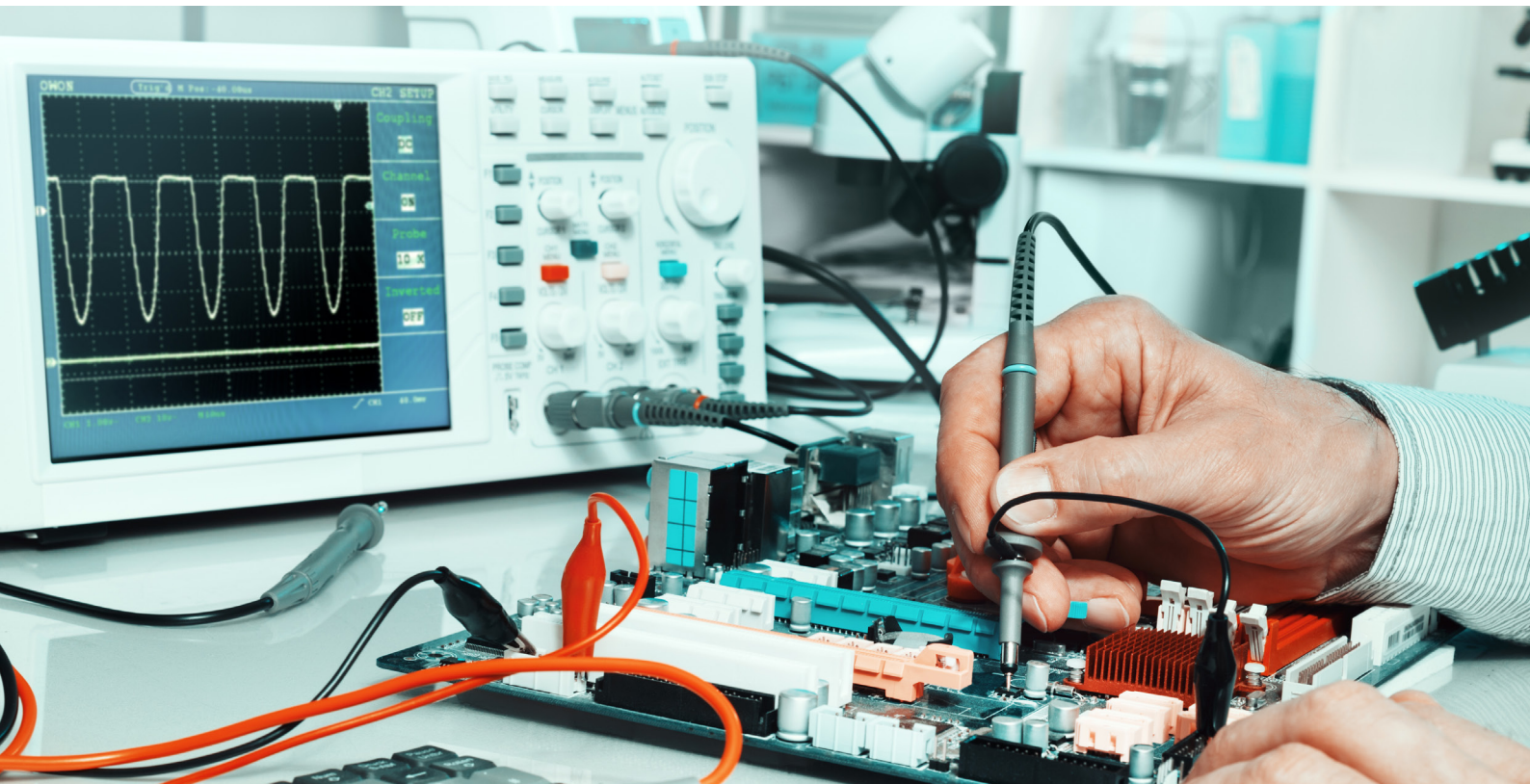
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## Career Paths

1. Electrical Engineer
2. Electronics Engineer
3. Power Systems Engineer
4. Telecommunications Engineer
5. Control Systems Engineer
6. Instrumentation Engineer
7. Renewable Energy Engineer
8. Embedded Systems Developer
9. Automation Engineer
10. Network Engineer

## Entry Requirements

1. The applicant must hold a diploma or associate degree from the Kingdom of Bahrain or its equivalent from outside the Kingdom, provided the qualification is accredited by the relevant authorities in the issuing country.
2. The applicant's cumulative GPA must be at least "Good" or its equivalent. Applicants with a lower GPA must provide evidence of at least one year of relevant professional experience or complete a set of remedial courses according to their specialization.
3. The applicant's previous specialization must qualify them to study in the programme they wish to join.
4. Applicants holding professional or vocational qualifications (such as National Diploma - ND, Higher National Diploma - HND, or equivalent) are required to complete a number of remedial courses according to their specialization, in addition to HEC compulsory courses where applicable.
5. The applicant must have obtained a score of 6.0 or higher in IELTS, or an equivalent qualification. (Free English-language support will be provided based on the initial OOPT test result.)



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# Study Plan

HEC Compulsory Courses				
No.	Course Code	Course Title	Credit	Level
1	ASU_S_HUR	Human Rights	0	S
2	ASU_S_ALA ASU_S_ALN	Arabic Language or Arabic Language for Non-Arabic Speakers	0	S
3	ASU_S_BCH	Bahrain Civilization CHistory	0	S

Programme Study Plan				
No.	Course Code	Course Title	Credit	Level
Year 1 – First Semester				
1	ASU_5_AMM	Advanced Engineering Mathematics and Modelling	20	5
2	ASU_5_CSS	Circuits, Signals and Systems	20	5
3	ASU_5_POC	Principles of Control	20	5
Year 1 – Second Semester				
1	ASU_5_TDP	Team Design Project	10	5
2	ASU_5_EPE	Electrical Machines and Power Electronics	20	5
3	ASU_5_ADC	Analogue and Digital Circuit Design	20	5
Year 1 – Summer Semester				
1	ASU_5_INT	Internship	10	5
Year 2 – First Semester				
1	ASU_6_DSD	Digital Systems Design	20	6
2	ASU_6_PRO	Project	40	6
Year 2 – Second Semester				
1	ASU_6_AAE	Advanced Analogue and RF Electronics	20	6
2	ASU_6_IAE	Innovation and Enterprise	20	6
3	ASU_6_CEN	Control Engineering	20	6

## **ASU\_5\_AMM Advanced Engineering Mathematics and Modelling**

This module covers advanced engineering mathematical techniques used for solving engineering problems, including Computational Techniques in Engineering, Vectors, Differential equations, Selected Numerical and Computational methods, Advanced Matrix computation techniques, and Advanced Computational Optimisation and advanced Statistical techniques, including Permutations and combinations. Binomial, Poisson and normal distributions.

## **ASU\_5\_CSS Circuits, Signals and Systems**

In practical engineering, it is very common to assume, at least initially, that the system to be analysed or designed is linear and time-invariant. Linear, time-invariant systems provide potentially good approximations of the behaviour of many systems in their normal operating region. The advantage of linear, time-invariant systems is that they can generally be analysed. On the other hand, Nonlinear systems cannot generally be analysed, and one is forced to resort to approximate analysis based on simulation. This module offers an introduction to the analysis of linear, time-invariant systems. Ideally, the analysis of a system involves the determination as mathematical functions of time of all of the signals associated with the system. Accordingly, it is impossible to provide an analysis procedure for systems without a preliminary discussion of signals. Specifically, the module introduces and explains the mathematical ideas, which underpin the very important concept of the frequency content of a signal. The module covers the mathematics required to undertake a study of dynamics, communication theory, signal processing, advanced circuit theory, partial differential equations and control theory, with engineering examples. The module also provides advanced techniques for the solution of linear, constant coefficient, and ordinary differential equations. The module includes a practical component where students perform Matlab/Simulink experiments to apply the theoretical concepts and gain practical skills in the design of linear systems.

## **ASU\_5\_POC Principles of Control**

The module is an introduction to the theory and practice of continuous-time feedback control systems to enable the design and implementation of control systems for applications, such as robotics, automobiles, aircraft, automatic machinery, and chemical processes. It provides an analytical approach to the modelling of dynamical systems and their analysis by applying engineering mathematics. The module includes a practical component where students perform experiments to apply the theoretical concepts and gain practical skills in control systems.

## **ASU\_5\_TDP Team Design Project**

This module aims at developing students' skills in engineering design, including identifying and meeting requirements for new products (tangible product, process, or system), such as consideration of regulatory, professional and standards requirements. The module develops students' abilities in working as part of a team, handling information, project planning and management, and report-writing and presentation skills.

## **ASU\_5\_EPE Electrical Machines and Power Electronics**

The module discusses the design of modern electrical drives, with consideration of the machine, power electronics and control requirements. Comparisons are made between drive types and typical applications considered. Magnetic and electric loadings; thermal design; winding design, choice of pole number, phase number, field and armature location. Permanent magnet machines; induction machines; switched reluctance machines; vector control of ac machines; applications characteristic of ac drives; comparative evaluation of different drives. Use of commercially available software to perform machine analysis and design. The module includes a practical component where students perform experiments to apply theoretical concepts and gain practical skills in electrical machines and power electronics.

## **ASU\_5\_ADC Analogue and Digital Circuit Design**

This module provides students with the knowledge of analogue, mixed-signal and digital circuits and also experience with both the practical issues of device-level design and system-level performance requirements. A key feature is a balanced approach to both analogue and digital IC design. The module includes a practical component where students perform experiments to apply the theoretical concepts and gain practical skills in analogue and digital circuit design.

## **ASU\_5\_INT Internship**

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

## **ASU\_6\_DSD Digital Systems Design**

This module covers the design and analysis of modern digital systems utilising finite state machines. Comparison between the use of CPLDs and microcontrollers in typical embedded systems will be made, and appropriate hardware and software methods for a successful design will be considered. Synchronous and asynchronous designs will be covered along with a consideration of the principles of 'design for testability' and JTAG technologies. CAD tools will be used to design and simulate integrated circuits on the silicon workspace. The module also covers further programming methods using HDLs and HLL programming of MCUs. The module includes a practical component where students perform lab experiments to apply the theoretical concepts and gain practical skills in designing and testing digital electronic systems.

## **ASU\_6\_PRO Project**

The Individual Project is a learning experience that enables students to do independent research and bring together many of the concepts they have learned. The work calls for careful planning, critical judgment, engineering competence, and communication skills. Further details are provided in the Individual Project Guide for Students. This guide may be updated from time to time and include information generally on how to plan the project, milestones, important dates, and deliverables. The module will spread over the first and second semesters of year 4.

## **ASU\_6\_AAE Advanced Analogue and RF Electronics**

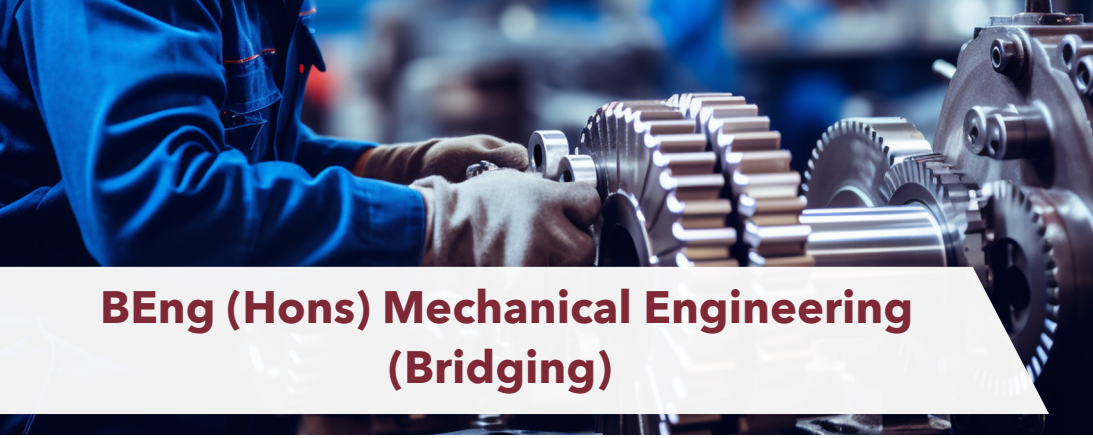
This module covers the design and analysis of radio frequency systems from early design to modern digital systems. Noise measurement, reduction, shielding, grounding and general issues of EMC are covered. RF terminology and wave propagation are explained, along with a look at modulation/demodulation techniques and the circuits needed to carry them out, such as mixers, oscillators, amplifiers, etc. The module includes a practical component where students perform experiments to apply the theoretical concepts and gain practical skills in analogue and RF electronics.

## **ASU\_6\_IAE Innovation and Enterprise**

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 business strategies, risk assessments and scenario testing so that they demonstrate the commercial viability of their ideas. Topics include project management skills, which help determine the critical path of a proposed business, such as intellectual property, market research, market placement, advertising and finance. Students will be expected to reflect on what they can contribute to a group.

## **ASU\_6\_CEN Control Engineering**

This module builds on the Level 5 module Principles of Control. It introduces a range of Analogue and Digital Control methods to estimate system dynamics and improve system stability, servo tracking and regulation of system outputs against unknown disturbances. Implementation of these methods in a laboratory will closely support the theory. The application-oriented part of the module will use case studies and laboratory work relating specifically to the individual disciplines. The module includes a practical component where students perform experiments to apply the theoretical concepts and gain practical skills in control engineering.



**LSBU**  
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Bank University



# BEng (Hons) Mechanical Engineering (Bridging)

## Programme Details

Final Qualification

BEng (Hons)

Language of Study

English

Mode of Study

Full Time

## Programme Structure

Study Period

2 Years

Total Credit Hours

81 Credit Hours

Number of Courses

15 Courses

## Brief about the Programme

The Bridging Programme is open to students who have completed a diploma or associate degree in related disciplines from the Kingdom of Bahrain or an equivalent qualification from outside the Kingdom, provided the certificate is accredited by the relevant authorities in the issuing country. This programme is designed to meet current industry standards, particularly the Engineering Council UK (ECUK) Standard for Professional Engineering Competence (UK-SPEC). The curriculum focuses on strengthening students' numerical, analytical, and practical abilities, supported by an enquiry-driven and innovative mindset that employers highly value. Mechanical engineering is a broad and diverse field, offering many specialisations. This programme provides students with a strong foundation suitable for progressing into a wide range of mechanical engineering areas after graduation.

The programme leads to a dual award from the Applied Science University (ASU Bahrain) and London South Bank University (LSBU-UK).

## Aims of the Programme

1. Graduates will develop a systematic understanding of key topics including Dynamics, Thermofluids, Solid Mechanics, and Manufacturing, supported by Mathematics, Electrical Engineering, and Computing.
2. Graduates will acquire analytical abilities and competence in analysing mechanical components and systems.
3. Graduates will enhance their practical skills in manufacturing, measurement, and instrumentation techniques.
4. Graduates will develop self-awareness, reflective skills, independent judgement, and lifelong learning abilities.
5. Graduates will master project management and demonstrate creativity in problem-solving, project execution, and innovation-driven design.



The first university in the Kingdom of Bahrain to achieve global accreditation from the British Quality Assurance Agency for Higher Education (QAA)



Rated 5 Stars in the QS Rating System



Ranked 30th in the QS Arab Region University Rankings 2026



Ranked 613 in the QS World University Rankings 2026



Ranked 30+ Worldwide in the Times Higher Education University Impact Rankings



**Head of Department:**

Dr. Malak Naji



**Office Number:**

+973 16036223



**Email:**

malak.naji@asu.edu.bh



**Dean of the College:**

Mohamed Salama



**Office Number:**

+973 16036273



**Email:**

mohamed.salama@asu.edu.bh



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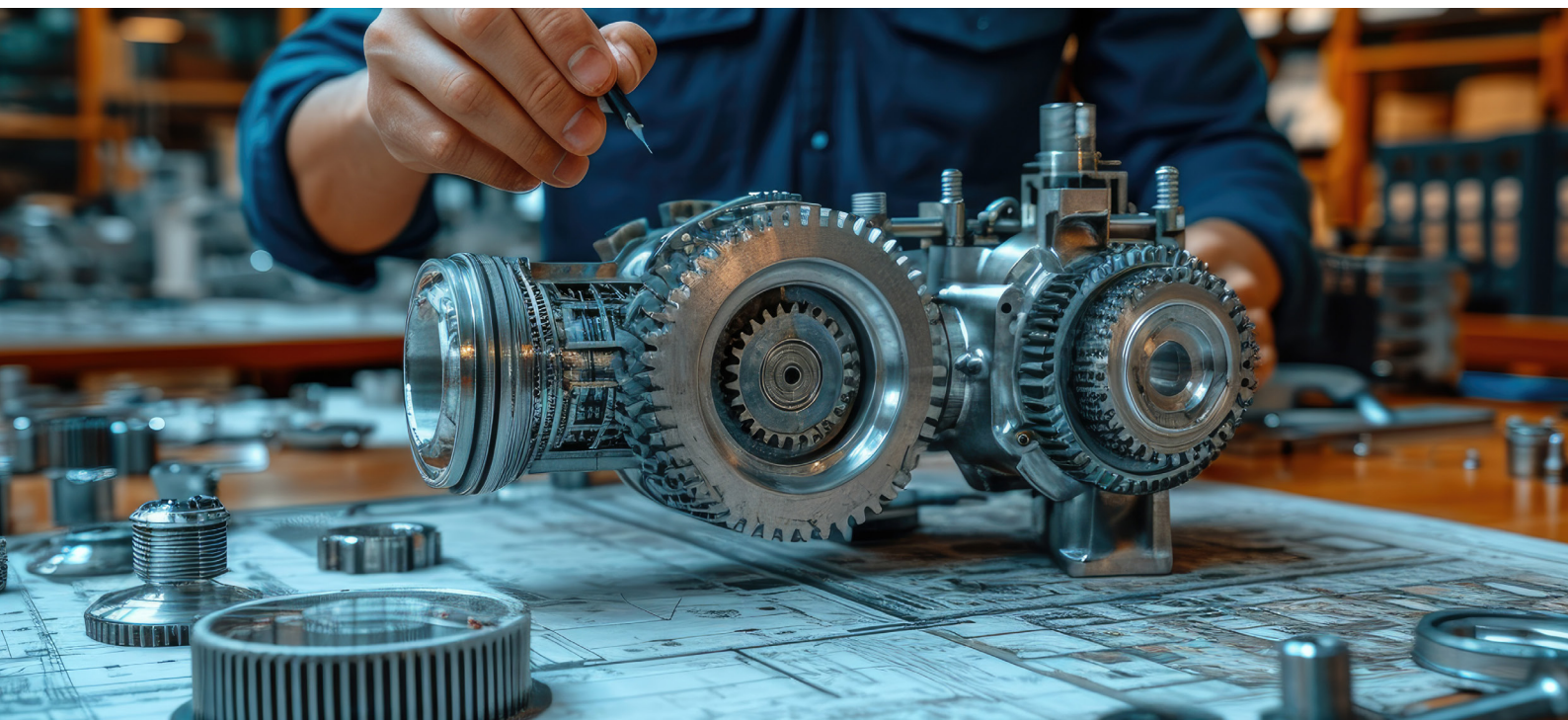
Enquiry

## Career Paths

1. Mechanical Engineer
2. Manufacturing Engineer
3. Automotive Engineer
4. Maintenance Engineer
5. HVAC Engineer
6. Robotics Engineer
7. Energy Systems Engineer
8. Quality Assurance Engineer
9. Industrial Engineer
10. Product Design Engineer

## Entry Requirements

1. The applicant must hold a diploma or associate degree from the Kingdom of Bahrain or its equivalent from outside the Kingdom, provided the qualification is accredited by the relevant authorities in the issuing country.
2. The applicant's cumulative GPA must be at least "Good" or its equivalent. Applicants with a lower GPA must provide evidence of at least one year of relevant professional experience or complete a number of remedial courses according to their specialization.
3. The applicant's previous specialization must qualify them to study in the programme they wish to join.
4. Applicants holding professional or vocational qualifications (such as National Diploma - ND, Higher National Diploma - HND, or equivalent) must complete remedial courses.
5. Required by their specialization, in addition to HEC compulsory courses where applicable.
6. The applicant must have obtained a score of 6.0 or higher in IELTS, or an equivalent qualification. (Free English-language support will be provided based on the initial OOPT test score.)



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# Study Plan

HEC Compulsory Courses				
No.	Course Code	Course Title	Credit	Level
1	ASU_S_HUR	Human Rights	0	S
2	ASU_S_ALA ASU_S_ALN	Arabic Language or Arabic Language for Non-Arabic Speakers	0	S
3	ASU_S_BCH	Bahrain Civilization C History	0	S

Programme Study Plan				
No.	Course Code	Course Title	Credit	Level
Year 1 – First Semester				
1	ASU_5_AEM	Advanced Engineering Mathematics	10	5
2	ASU_5_DC1	Design and Construction 1	10	5
3	ASU_5_HYD	Hydraulics	10	5
4	ASU_5_STM	Structural Mechanics	10	5
5	ASU_5_EEG	Environmental Engineering	10	5
6	ASU_5_EME	Engineering Management and Economics	10	5
Year 1 – Second Semester				
1	ASU_5_IHE	Infrastructure and Highway Engineering	10	5
2	ASU_5_DC2	Design and Construction 2	10	5
3	ASU_5_ASD	Advanced Structural Analysis and Design	10	5
4	ASU_5_THS	Theory of Structures	10	5
5	ASU_5_CCF	Civil Engineering and Construction Field Studies	10	5
Year 1 – Summer Semester				
1	ASU_5_ITS	Internship	10	5
Year 2 – First Semester				
1	ASU_6_SA1	Structural Design and Analysis 1	10	6
2	ASU_6_CEM	Civil Engineering Materials	10	6
3	ASU_6_FDS	Foundations	10	6
4	ASU_6_ESD	Engineering System Design	10	6
5	ASU_6_ERM	Engineering Research Methods	10	6
6	ASU_6_IEM	Innovation, Enterprise and Management	10	6
Year 2 – Second Semester				
1	ASU_6_CTC	Current Topics in Civil and Construction Engineering	10	6

2	ASU_6_GTE	Geotechnical Engineering	10	6
3	ASU_6_SA2	Structural Design and Analysis 2	10	6
4	ASU_6_CMG	Construction Management	10	6
5	ASU_6_PRJ	Project	20	6

## **ASU\_5\_AEM Advanced Engineering Mathematics**

This module covers advanced undergraduate engineering mathematics.

## **ASU\_5\_DC1 Design and Construction 1**

This module offers the knowledge and skills of masonry and reinforced masonry structure design to Eurocodes, analysis of structural form and the ability to design in both qualitative and quantitative directions.

## **ASU\_5\_HYD Hydraulics**

This module develops the fundamental principles of Fluid Mechanics and applies them to practical applications of analysis and design. Students 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. Students will perform simple laboratory tests and prepare a formal report.

## **ASU\_5\_STM Structural Mechanics**

This module introduces Building Information Modelling (BIM) and explains how BIM has changed the construction industry worldwide. Case studies of projects where BIM improved sustainability and reduced cost were studied. Students model typical multi-storey framed steel and concrete buildings in Autodesk Revit and apply appropriate variable actions on the floors. They transfer the building model to the Autodesk Robot Structural Analysis programme, analyses, design beams, and columns. They compare computer results to hand calculations results, obtained using load take-down methods and design formulae.

## **ASU\_5\_EEG 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, water quality, and wastewater treatment processes and to consider sustainability issues. Students will develop an understanding of the hydrological cycle and surface hydrology and apply these principles to the calculation of precipitation and unit hydrograph. Students will also learn the basics of groundwater flow and the problem of contamination in groundwater. The unit also introduces air pollution and noise pollution.

## **ASU\_5\_EME Engineering Management and Economics**

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

- Detailed study of project planning techniques, including network techniques, with preparation for the student's 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.

## **ASU\_5\_IHE Infrastructure and Highway Engineering**

This is substantially a theory and 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. Standard laboratory tests were carried out, and bitumen properties were derived from the results. Problems to be solved include geometric design, traffic volume, channelisation, and hydrology. Lab projects involve roadway designing.

## **ASU\_5\_DC2 Design and Construction 2**

This module offers the knowledge and skills of marine structures, analysis and design of Eurocodes, analysis of structural form and the ability to design in both qualitative and quantitative directions, including ports and offshore structures and dams.

## **ASU\_5\_ASD Advanced Structural Analysis and Design**

This module develops students' practice with structural engineering, provides an introduction to structural concepts, and provides an overview of specific techniques for analysing indeterminate structures, beams and frame structures.

## **ASU\_5\_THS Theory of Structures**

This module mainly deals with the matrix-stiffness analysis of structures. It begins with a review of the basic concepts of structural analysis and matrix algebra and shows how the latter provides a mathematical framework for the former.

This is followed by detailed descriptions and demonstrations through many examples of how matrix methods can be applied to linear static analysis of skeletal structures (plane and space trusses; beams and grids; plane and space frames) by the stiffness method.

Also, it is shown how simple structures can be conveniently solved using a reduced stiffness formulation, involving far less computational effort. Finally, the Finite Element Analysis is discussed.

## **ASU\_5\_CCF 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.

## **ASU\_5\_ITS Internship**

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

## **ASU\_6\_SA1 Structural Design and Analysis 1**

This module offers the knowledge and skills of reinforced concrete design to Eurocodes, analysis of structural form and the ability to design in both qualitative and quantitative directions.

## **ASU\_6\_CEM\_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.

## **ASU\_6\_FDS Foundations**

Shallow foundations design. Bearing capacities of soils, safe, net and ultimate; 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; 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\_6\_ESD Engineering System Design**

To involve the student in the process of engineering project development from planning to detailed design and working with a project team.

## **ASU\_6\_ERM 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 topics such as the identification of a topic by the student, proposition of hypothesis, formulation of research inquiries, development of literature review, and select research design and methodologies. Additionally, students will learn data collection techniques; primary and secondary data with application to specific problems, scaling and research instrument design and sampling design.

## **ASU\_6\_IEM 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.

One of the assignments will require students to work in groups, typically to adopt a concept and develop it such that it could be commercially viable and sustainable. This might be a product or a service (such as consultancy or contract management).

Students will experience topics addressing intellectual property, market research, market placement, advertising and finance. They will be expected to reflect on what they can contribute to a group.

## **ASU\_6\_CTC 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. Students will experience topics addressing Building Information Modelling, 3D Printing, Smart analyses of Buildings and Smart Cities, Modular Construction, Plastic Roads, Sustainability issues, and other related matters

## **ASU\_6\_GTE Geotechnical Engineering**

This module shows how the soil mechanics theories introduced in Soil Mechanics w applied to the solution of a number of geotechnical analyses and design problems.

## **ASU\_6\_SA2 Structural Design and Analysis 2**

This module offers the knowledge and skills of steel design to Eurocodes, analysis of structural form and the ability to design in both qualitative and quantitative directions.

## **ASU\_6\_CMG 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.

## **ASU\_6\_PRJ Project**

To plan, execute, review and report upon a piece of project work related to the BEng programme being followed by the student. A Module Guide for the project is augmented by eight lectures.



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## CONTACT US

  
ASU\_bh

**facebook**  
ASUBAHRAINOFFICIAL

 **YouTube**  
ASU Bahrain

**EMAIL:**  
Info@asu.edu.bh

**WEBSITE:**  
www.asu.edu.bh

**WHATSAPP:**  
+97366633770

**TEL:**  
+97317728777  
+97316018866  
+97316018888

**ADDRESS:**  
Building 166, Road 23,  
Block 623 East Al-Ekir,  
P.O. Box 5055  
Kingdom of Bahrain