الجامعة الأمريكية بالبحرين

AMERICAN UNIVERSITY OF BAHRAIN

Academic Catalog
2024 - 2025

August 2024

ABOUT

Overview

AUBH is the first comprehensive American-model co-educational university in the Kingdom of Bahrain. The University offers a holistic journey for students and a unique approach to education that fosters interaction and collaboration between students, faculty, and the professional community.

The contemporary, 75,000 square meter campus is located in Riffa, Bahrain. The innovative and high-tech campus enhances the teaching and learning experience for both faculty and students. Along with classrooms, library and labs, the campus includes a Sports Center with indoors and outdoors courts and fields, vast Student Commons, and an Auditorium for special events.

AUBH curricula is built by experts and specialists to equip students with the knowledge and soft skills to succeed in a rapidly, ever-changing environment. The AUBH quality of American-model education mirrors that of the best universities in the United States. The University's unique academic structure enables students to find their real passions and allows them to develop their abilities, leading to long successful careers in their chosen industry.

Mission

Our mission is to provide transformative, flexible, and innovative learning opportunities to position graduates to launch and sustain satisfying and successful careers. We will foster learner success by promoting interdisciplinarity and entrepreneurial endeavors, providing analytical and technical skills necessary to thrive in the digital economy, and engaging with our communities to foster respect, positive impact, and social responsibility.

Vision

The American University of Bahrain will be internationally recognized for quality and innovation in learning, the success of the leaders it graduates, and its positive impact on social and economic transformation.

HEC Approvals

The American University of Bahrain is a licensed provider of academic qualifications by the Bahraini Higher Education Council (HEC); all academic programs addressed in this document are approved by the HEC.

Liberal Arts Education

The educational purpose of American University of Bahrain is to create an academic and social environment where students are guided and supported in developing and achieving personal and professional goals. Students are challenged to develop as independent, effective, active, rational, and creative thinkers who appreciate and respect social, moral, and ethical values. To this end, the

academic programs of American University of Bahrain are characterized by an integrated general education curriculum and strong academic and career concentrations.

General Education Requirements

The diverse and comprehensive general education curriculum gives students the foundation to connect ideas and apply concepts across disciplines. General education content encourages and supports the general development of all students alongside the specific professional knowledge and skills of the professional program content. The American University of Bahrain aims for graduates to understand the world in which they live and to contribute to society.

All our degree programs share a "General Education" component which sits at the heart of the American model of education. The General Education Program ensures that students are equipped with the key transferable skills that they need, not only to succeed in their academic program of choice, but also in their future career. It provides them with a foundation in all major areas of knowledge, including mathematics, social sciences, natural sciences, arts and humanities, and lifelong learning, while widening the scope of their horizon. In addition, the General Education Program allows students to transfer credits from one degree to another, if they decide to change majors, without hindering their academic progression.

Mission of General Education

The mission of the general education curriculum is to broaden students' understanding of the arts, mathematics, natural sciences, and social sciences, and to support the development of individual common skills, which will enable students to perform effectively, not only in their future careers but also as functional and confident members of society.

Goals of General Education

The specific goals of the general education curriculum are as follows:

- Develop English language competency.
- Provide an introduction to the sciences, technology, mathematics, social sciences, and Arabic heritage.
- Foster individual development.
- Develop cultural awareness and understanding.
- Develop critical thinking skills.
- Foster understanding of the roles and responsibilities of citizenship in the global community.
- Enable students to be lifelong learners capable of adapting to the changing demands of work and society.
- To enhance creativity and build real-world problem-solving skills.

General Education Learning Outcomes

By the end of the general education curriculum, a student will be prepared to do the following:

- Demonstrate detailed knowledge and understanding of methods, intellectual approaches and fundamental concepts from relevant disciplines as well as connections across disciplines.
- Effectively apply concepts and principles specific to relevant disciplines as well as across disciplines.

- Develop an understanding and suggest solutions to solve local and global issues using critical analysis and drawing information from various sources and/or perspective.
- Use numeracy and ICT skills to interpret, evaluate and employ reasoning in various contexts.
- Communicate clearly and effectively in written, oral and/or performative forms in a variety of contexts.
- Operate efficiently individually, in teams as leaders and team members, to achieve desired goals.
- Develop lifelong learning skills that are transferable to different contexts.

ACADEMIC PROGRAMS

The American University of Bahrain offers the following degree programs:

The College of Business and Management

- Bachelor of Business Administration in Finance
- Bachelor of Business Administration in Management
- Bachelor of Business Administration in Human Resource Management
- Bachelor of Business Administration in Digital Marketing and Social Media
- Master of Business Administration

The College of Media and Design

- Bachelor of Arts in Multimedia Design

The College of Engineering and Computing

- Bachelor of Science in Computer Engineering
- Bachelor of Science in Industrial Engineering
- Bachelor of Science in Mechanical Engineering
- Bachelor of Science in Computer Science
- Bachelor of Science in Civil Engineering
- Bachelor of Science in Cybersecurity
- Bachelor of Science in Data Science and Artificial Intelligence
- Bachelor of Science in Software Engineering
- Master of Science in Engineering management

COLLEGE OF BUSINESS AND MANAGEMENT

Mission and Objectives of the College of Business and Management

The mission of the College of Business and Management is to transform students into effective decision-makers who are ready to compete in a dynamic business environment by being socially responsible, ethically focused, and globally oriented. In support of the mission of American University of Bahrain, the fundamental objectives of the College of Business and Management are as follows:

CEO. 1: Demonstrate specialized knowledge in a particular field of study such as accounting, marketing, management, finance, and economics, and general understanding of the core business concepts and theories. [Knowledge: Theoretical Understanding]
CEO. 2: Demonstrate an ability to apply common quantitative and qualitative analysis with the aid of analytical tools in the field of business studies. [Knowledge: Applied Understanding, Skills: Communications, ICT, and Numeracy]
CEO. 3: Critically analyze business related issues, constructing viable solutions to solve real life problems. [Skills: Generic Problem Solving & Analytical Skills]
CEO. 4: Demonstrate effective oral and written communication skills, including the ability to develop sound and coherent arguments in the context of business through formal or informal presentations and/ or other forms of written communication. [Skills: Communications, ICT, and Numeracy]
CEO. 5: Demonstrate the ability to work professionally, ethically, and effectively individually as well as in a team in familiar and unfamiliar contexts to achieve specific outcomes. [Competence: Autonomy, Responsibility & Context]

Bachelor of Business Administration in Finance

The Bachelor of Business Administration in Finance is a 4-year undergraduate curriculum that prepares students for careers in industry, public accounting, government, and nonprofit organizations, as well as for advanced study. The goal of the Bachelor of Business Administration in Finance is to provide students with a foundation in business with an emphasis in finance. The use of problem analysis, critical thinking, communication skills, and technological skills is emphasized to analyze ambiguous situations and provide relevant business alternatives. Graduates of the Bachelor of Business Administration in Finance can pursue a wide range of activities including auditing, accounting, financial planning, budgeting, and management consulting.

Program Learning Outcomes

1. Demonstrate critical theoretical and practical knowledge of practices, concepts, and theories in the business field with a focus on finance. [Knowledge: Theoretical Understanding]
2. Effectively apply the concepts and principles of business to practical applications that may include – but are not limited to- financial analysis, budgeting, forecasting, investment management, capital budgeting, and risk management. [Knowledge: Practical Application]
3. Critically synthesize complex information into meaningful business perspectives that facilitate actionable solutions [Skills: Generic Problem Solving & Analytical Skills]

4. Develop ability to utilize relevant software and technological aids to analyze data with specific applications in finance. [Skills: Communication, ICT and Numeracy, Skills: Generic Problem Solving & Analytical Skills]
5. Demonstrate effective oral and written communication skills, including the ability to develop sound and coherent arguments in the context of business through formal or informal presentations and/ or other forms of written communication. [Skills: Communication, ICT and Numeracy]
6. Demonstrate the ability to work professionally, ethically, and effectively individually as well as in a team in familiar and unfamiliar contexts to achieve specific outcomes. [Competence: Autonomy, Responsibility & Context]

All students pursuing the Bachelor of Business Administration in Finance must complete a minimum of 125 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of 38 credits of general education requirements
- A minimum of 39 credits of business core requirements
- A minimum of 33 credits of major requirements
- A minimum of 9 credits of major electives
- A minimum of 6 credits of professional elective options

General Education Requirements (38 credits)

The following courses constitute the general education requirements for the Bachelor of Business Administration in Finance:

<u>English Requirements (6 credits)</u>

ENGL 101	Composition I	(3 credits)
ENGL 102	Composition II	(3 credits)

<u>National Requirements (7 credits)</u>

ARHG 104/101	Arabic for Arabic Speakers/Arabic for non-Arabic speakers	(3 credits)
ARHG 107	Human Rights	(2 credits)
ARHG 106	Modern History of Bahrain	(2 credits)

<u>Mathematics Requirements (6 credits)</u>

MATH 115	Introduction to Probability and Statistics	(3 credits)

Choose one course:

MATH 130*	College Algebra	(3 credits)
MATH 131*	Finite Math with Calculus	(3 credits)

*Students can be exempted from these courses if they successfully completed any 100 level (NQF level 5) university math course

<u>ICT Requirements (3 credits)</u>

COSC 101	Introduction to Computing	(3 credits)

<u>Lifelong Learning Requirements (1 credit)</u>

UNSS 101	University Success	(1 credit)

Arts and Humanities Requirements (3 credits) – Choose one course

Students may choose any of the course that satisfies the Art and Humanities Requirements approved by the Division of Art & Science. For example, world history, humanities, public speaking, and others.

Natural Science Requirements (4 credits) – Choose one course and its lab
Examples of course subjects that satisfy the Natural Sciences Requirements include Biology, Chemistry, Geology, and Physics. Other courses may be considered if approved by the academic unit in advance.

Social and behavioral Science Requirements (3 credits)

ENGL 205 Business Communication (3 credits)

General Education electives (5 credits)
A minimum of 5 credits can be taken from any of the general education courses (free general education electives).

Business Core Requirements (39 Credits)

The following courses constitute the business core requirements for the Bachelor of Business Administration in Finance:

- ACCT 201 Introduction to Financial Accounting (3 credits)
- ACCT 202 Introduction to Managerial Accounting (3 credits)
- BUSN 101 Introduction to Business (3 credits)
- BUSN 301 Business Law (3 credits)
- ECON 201 Principles of Microeconomics (3 credits)
- ECON 202 Principles of Macroeconomics (3 credits)
- FINC 201 Essentials of Financial Analysis (3 credits)
- MGMT 101 Principles of Management (3 credits)
- MGMT 205 Organizational Behavior (3 credits)
- MGMT 350 Business Ethics (3 credits)
- MGMT 410 Business Policy and Strategic Management (3 credits)
- MRKG 101 Principles of Marketing (3 credits)
- MSYS 201 Principles of Management Information Systems (3 credits)

Major Requirements (33 Credits)

The following courses constitute the major core requirements for the Bachelor of Business Administration in Finance:

- FINC 221 Banking (3 credits)
- ACCT 311 Intermediate Accounting (3 credits)
- FINC 231 Managerial Finance (3 credits)
- FINC 311 Corporate Finance (3 credits)

- FINC 312 International Finance (3 credits)
- FINC 411 Investment and Portfolio Management (3 credits)
- FINC 421 Alternative Investments (3 credits)
- BUSN 401 Business Research Methods (3 credits)
- FINC 499 Capstone Project (6 credits)
- FINC 480 Finance Internship (3 credits)

Major Electives (9 Credits)

- FINC 451 Starting a New Business (3 credits)
- FINC 461 Mergers and Acquisitions (3 credits)
- FINC 371 Financial markets and Institutions (3 credits)
- FINC 410 Data Mining and Machine Learning (3 credits)
- FINC 412 Data Driven Financial Analysis (3 credits)
- BUSN 410 Artificial Intelligence for Business (3 credits)
- FINC 414 Islamic Banking and Finance (3 credits)

Students pursuing a Bachelor of Business Administration in Finance must complete a minimum of nine elective credits in finance (FINC) coursework offered at or above the 300 level and which are not considered courses within the major requirements.

Professional Elective Options (6 Credits)

Students pursuing a BBA in Finance must complete a minimum of 6 Professional Elective credits. Professional Elective credits may be earned via any course offered at or above the 200 level.

Bachelor of Business Administration in Management

The Bachelor of Business Administration in Management is a 4-year undergraduate curriculum designed to provide students with the necessary knowledge and leadership skills to succeed in managerial functions. The Bachelor of Business Administration in Management prepares students for careers in industry, government, and nonprofit organizations, as well as for advanced study. The goal of the Bachelor of Business Administration in Management is to provide students with a foundation in business with an emphasis in management. The use of problem analysis, critical thinking, communication skills, and technological skills is emphasized to analyze ambiguous situations and provide relevant business alternatives.

Program Learning Outcomes

1. Demonstrate critical knowledge and understanding of a range of contemporary business and management concepts, theories, and issues in the global business environment. [Knowledge: Theoretical Understanding]

2. Demonstrate critical thinking with the ability to assess the policies and actions of an organization against best practice [Knowledge: Practical Application]

3. Use qualitative and quantitative methods to analyze current and potential problems facing an organization and recommend possible solutions [Skills: Generic Problem Solving & Analytical Skills; Skills: Communication, ICT and Numeracy]

4. Demonstrate effective oral and written communication skills, including the ability to develop sound and coherent arguments in the context of business through formal or informal presentations and/ or other forms of written communication. [Skills: Communication, ICT and Numeracy]

5. Demonstrate the ability to work professionally, ethically, and effectively individually as well as in a team in familiar and unfamiliar contexts to achieve specific outcomes. [Competence: Autonomy, Responsibility & Context]

6.

All students pursuing the Bachelor of Business Administration in Management must complete a minimum of 125 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of 38 credits of general education requirements
- A minimum of 39 credits of business core requirements
- A minimum of 33 credits of major requirements
- A minimum of 9 credits of major electives
- A minimum of 6 credits of professional elective options

General Education Requirements (38 credits)

<u>English Requirements (6 credits)</u>

ENGL 101	Composition I	(3 credits)
ENGL 102	Composition II	(3 credits)

<u>National Requirements (7 credits)</u>

ARHG 104/101	Arabic for Arabic Speakers/ Arabic for non-Arabic speakers	(3 credits)
ARHG 107	Human Rights	(2 credits)
ARHG 106	Modern History of Bahrain	(2 credits)

<u>Mathematics Requirements (6 credits)</u>

MATH 115	Introduction to Probability and Statistics	(3 credits)

Choose one course:

MATH 130*	College Algebra	(3 credits)
MATH 131*	Finite Math with Calculus	(3 credits)

*Students can be exempted from these courses if they successfully completed any 100 level (NQF level 5) university math course

<u>ICT Requirements (3 credits)</u>

COSC 101	Introduction to Computing	(3 credits)

<u>Lifelong Learning Requirements (1 credit)</u>

UNSS 101 University Success (1 credit)

Arts and Humanities Requirements (3 credits) – Choose one course

Students may choose any of the course that satisfies the Art and Humanities Requirements approved by the Division of Art & Science. For example, world history, humanities, public speaking, and others.

Natural Science Requirements (4 credits) – Choose one course and its lab
Examples of course subjects that satisfy the Natural Sciences Requirements include Biology, Chemistry, Geology, and Physics. Other courses may be considered if approved by the academic unit in advance.

Social and behavioral Science Requirements (3 credits)

ENGL 205 Business Communication (3 credits)

General Education electives (5 credits)
A maximum of 5 credits can be taken from any of the general education courses (free general education electives).

Business Core Requirements (39 Credits)

The following courses constitute the business core requirements for the Bachelor of Business Administration in Management:

- ACCT 201 Introduction to Financial Accounting (3 credits)
- ACCT 202 Introduction to Managerial Accounting (3 credits)
- BUSN 101 Introduction to Business (3 credits)
- BUSN 301 Business Law (3 credits)
- ECON 201 Principles of Microeconomics (3 credits)
- ECON 202 Principles of Macroeconomics (3 credits)
- FINC 201 Financial Management (3 credits)
- MGMT 101 Principles of Management (3 credits)
- MGMT 205 Organizational Behavior (3 credits)
- MGMT 350 Business Ethics (3 credits)
- MGMT 410 Business Policy and Strategic Management (3 credits)
- MRKG 101 Principles of Marketing (3 credits)
- MSYS 201 Principles of Management Information Systems (3 credits)

Major Requirements (33 Credits)

The following courses constitute the major requirements for the Bachelor of Business Administration in Management:

- MGMT 411 Operations Management (3 credits)
- MGMT 302 Managing Human Resources (3 credits)

- MGMT 413 Management and Leadership Development (3 credits)
- MGMT 305 International Business (3 credits)
- MGMT 306 Cross-Cultural Management (3 credits)
- MGMT 430 Project Management (3 credits)
- BUSN 401 Business Research Methods (3 credits)
- MGMT 499Case study, project or dissertation /Capstone Project (6 credits)
- MGMT 480 Management Internship (3 credits)

Major Electives (9 Credits)

- MGMT 310 Managing Family Business (3 credits)
- MGMT 412 Negotiations and Conflict Management (3 credits)
- MGMT 313 Managing Change and Innovation (3 credits)
- MGMT 414 Management Intervention and Consultation (3 credits)
- MGMT 403 Entrepreneurship (3 credits)
- BUSN 410 Artificial Intelligence for Business (3 credits)

Students pursuing a Bachelor of Business Administration in Management must complete a minimum of nine credits in management (MGMT) coursework offered at or above the 300 level and which are not considered courses within the major requirements.

Professional Elective Options (6 Credits)

Students pursuing a BBA in Management must complete a minimum of 6 Professional Elective credits. Professional Elective credits may be earned via any course offered at or above the 200 level.

Bachelor of Business Administration in Human Resource Management

Objectives of the Program

The BBA in Human Resource Management degree program at the American University of Bahrain provides a focused professional foundation for students wishing to enter careers in the field of Human Resource Management. In order to achieve competitive advantage, contemporary organizations place considerable emphasis on aligning the contribution of employees to the strategic objectives of organizations. This degree aims to provide students with the knowledge, skills and competencies required by HRM practitioners. They will develop an appreciation of the impact of internal and external issues facing their company's employees, the strategic nature of human resource management interventions, empathy and active listening and communication skills, global thinking, the challenges of working in a changing environment and the key behaviors of a HR professional practitioner.

Why a Student Should Take This Program

Human Resource Management is an essential business function that exists in every professional organization. Graduates of the program will be able to pursue career opportunities in private organizations and public institutions in the following areas:

- Compensation and Benefits Specialist
- Employee Relations Specialist
- Recruiter / Talent Specialist
- Training and Professional Development Specialist

Program Learning Outcomes

Upon successful completion of the program a graduate will be able to:

1. Demonstrate understanding of the contribution of HRM interventions and strategic initiatives in domestic and multinational organizations.
2. Adapt appropriate HRM strategies in domestic and multinational organizations in order to formulate solutions to improve human performance and enhance company competitive standing.
3. Demonstrate creativity in designing effective HRM policies and analyze the validity of the results within the organization.
4. Interpret and evaluate numerical and graphical data obtained from HRM functions such as recruitment and selection, performance management, training evaluation, and compensation administration.
5. Demonstrate effective communication skills, critical thinking skills, and professional and personal development skills that enable them to manage complex problems in the workplace effectively.
6. Display a range of personal and interpersonal skills, including the capacity for continuous learning, taking initiatives, performing to deadlines, working in a team, communicating effectively and persuasively, skills which are necessary to enter a career in business organizations or undertake further study.

General Description of Graduate Profile

Students will develop both general and specific competencies in the human resource management field. These include critical thinking, informed and responsible decision making, achievement of professional responsibilities effectively in both local and international contexts, the ability to work with diverse populations to complete tasks and meet team objectives and the ability to lead and inspire others by effective and targeted communications.

Graduates will develop their mastery of not only technical competencies, but also of behavioral competencies required in the Human Resource Management profession, such as Ethical Practice, Leadership & Navigation, Business Acumen, Relationship Management, Communication, Consultation, Critical Evaluation and Global & Cultural Effectiveness.

Program Structure

All students pursuing the BBA in Human Resource Management must complete a minimum of 125 credits with a cumulative minimum GPA of 2.0. Specific requirements are:

- A minimum of 38 credits of General Education Requirements
- A minimum of 39 credits of Business Core Requirements
- A minimum of 33 credits of Major Requirements
- A minimum of 9 credits of Major Electives Requirements
- A minimum of 6 credits of Professional Elective Requirements

General Education Requirements (38 credits)

Courses listed below are common to all AUBH Business courses and have received approval from the Higher Education Council (HEC).

<u>English Requirements (6 credits)</u>

ENGL 101	Composition I	(3 credits)
ENGL 102	Composition II	(3 credits)

<u>National Requirements (7 credits)</u>

ARHG 104/101	Arabic for Arabic Speakers/Arabic for non-Arabic speakers	(3 credits)
ARHG 107	Human Rights	(2 credits)
ARHG 106	Modern History of Bahrain	(2 credits)

<u>Mathematics Requirements (6 credits)</u>

MATH 115	Introduction to Probability and Statistics	(3 credits)

Choose one course:

MATH 130*	College Algebra	(3 credits)
MATH 131*	Finite Math with Calculus	(3 credits)

*Students can be exempted from these courses if they successfully completed any 100 level (NQF level 5) university math course

<u>ICT Requirements (3 credits)</u>

COSC 101	Introduction to Computing	(3 credits)

<u>Lifelong Learning Requirements (1 credit)</u>

UNSS 101 University Success (1 credit)

Arts and Humanities Requirements (3 credits) – Choose one course

Students may choose any of the course that satisfies the Art and Humanities Requirements approved by the Division of Art & Science. For example, world history, humanities, public speaking, and others.

Natural Science Requirements (4 credits) – Choose one course and its lab
Examples of course subjects that satisfy the Natural Sciences Requirements include Biology, Chemistry, Geology, and Physics. Other courses may be considered if approved by the academic unit in advance.

Social and behavioral Science Requirements (3 credits)

ENGL 205 Business Communication (3 credits)

General Education electives (5 credits)
A maximum of 5 credits can be taken from any of the general education courses (free general education electives).

Business Core Requirements (39 Credits)

The following courses constitute the business core requirements for the BBA in Human Resource Management:

- ACCT 201 Introduction to Financial Accounting (3 credits)
- ACCT 202 Introduction to Managerial Accounting (3 credits)
- BUSN 101 Introduction to Business (3 credits)
- BUSN 301 Business Law (3 credits)
- ECON 201 Principles of Microeconomics (3 credits)
- ECON 202 Principles of Macroeconomics (3 credits)
- FINC 201 Essentials of Financial Analysis (3 credits)
- MGMT 101 Principles of Management (3 credits)
- MGMT 205 Organizational Behavior (3 credits)
- MGMT 350 Business Ethics (3 credits)
- MGMT 410 Business Policy and Strategic Management (3 credits)
- MRKG 101 Principles of Marketing (3 credits)
- MSYS 201 Principles of Management Information Systems (3 credits)

Major Requirements (33 credits)
The following courses constitute the Major Requirements for the BBA in Human Resource Management:

- HRMT 302 Recruiting the Best Talent (3 credits)
- HRMT 304 Compensation, Benefits and HRIS Systems (3 credits)
- HRMT 401 Labor Relations and Ethical Issues in HRM (3 credits)
- HRMT 402 Training, Coaching, and Succession Planning (3 credits)

- HRMT 403 Relationship and Performance Management (3 credits)
- HRMT 480 Human Resources Internship (3 credits)
- HRMT 495 Research Influence on HRM Practice (3 credits)
- HRMT 499 Research Project: HR Practitioner Case Study (6 credits)
- MGMT 302 Managing Human Resources (3 credits)

Major Elective Requirements (9 credits)
Students pursuing a BBA in Human Resource Management degree must complete a minimum of 9 elective credits from the choices below:

- HRMT 305 Role of an HR Practitioner and Leader (3 credits)
- HRMT 406 International HRM (3 credits)
- MGMT 412 Negotiations and Conflict Management (3 credits)
- MGMT 313 Managing Change and Innovation (3 credits)
- MGMT 411 Operations Management (3 credits)
- MGMT 306 Cross-Cultural Management (3 credits)
- BUSN 410 Artificial Intelligence for Business (3 credits)

Professional Elective Requirements (6 credits)
Students pursuing a BBA in Human Resource Management must complete a minimum of 6 Professional Elective credits. Professional Elective credits may be earned via any courses offered at or above the 200 level.

Bachelor of Business Administration in Digital Marketing and Social Media

Objectives of the Program

The BBA in Digital Marketing and social media at the American University of Bahrain is a 4-year undergraduate curriculum that prepares students for careers in industry, marketing companies, and social media platforms, as well as for advanced study. The goal of the Bachelor of Digital Marketing and Social Media is to prepare students to comprehensively manage and solve marketing tasks and to connect marketing with other fields. Moreover, the concentration in marketing and social media allows students to apply the gained knowledge of popular social channels in the context of growing business. Graduates of the Bachelor of Digital Marketing and Social Media can pursue a wide range of activities such as social media coordinators, marketing directors, social media managers, marketing communications managers, video/audio producer and web developer.

Why a Student Should Take This Program

The Digital Marketing and Social Media Marketing program includes a unique combination of communication courses, business and marketing courses, and visual design courses designed to prepare students for jobs in the real world. The contemporary business world has an increasing need for professionals who can effectively comprehend, plan, and communicate brand messaging across various digital networks and platforms. Through targeted social media marketing courses, this bachelor's degree in marketing and social media prepares students with the knowledge to plan comprehensive social strategies including SEO, content marketing, and digital advertising, analyze sophisticated data, and drive the online solutions necessary for success. Bring advanced communication and technological skills to a variety of business sectors and industries with this marketing and social media degree.

Program Learning Outcomes

Upon successful completion of the program a graduate will be able to:

1. Demonstrate critical understanding of the principles and concepts of digital and social media marketing, including relevant theories in associated fields of knowledge.
2. Apply appropriate methods of digital and social media marketing research and create effective content and campaigns using industry standard software and platforms.
3. Use qualitative and quantitative methods to analyze current and potential marketing and business-related problems facing an organization and recommend solutions.
4. Demonstrate effective oral and written communication skills, including the ability to develop coherent arguments in the context of the digital and social media marketing environment.
5. Demonstrate the ability to work individually and collaboratively with team members and managers from other core business functions to address marketing and business needs.
6. Demonstrate creativity and innovation in the planning, creation, and implementation of business and marketing strategies.

General Description of Graduate Profile

The steady increase in the need for marketing managers, especially ones who understand social media marketing, is largely due to the rapid change technology has made to the field of marketing. The growing reliance on technology and the internet to convey marketing materials to consumers means that social media marketers will continue to be in need for years to come.

A graduate from digital marketing and social media program will have the knowledge of marketing research, strategic marketing planning and consumer behavior as well as social media marketing concentration courses such as social media marketing strategy and social media marketing management.
Holding a bachelor's degree in digital marketing and social media from the American University of Bahrain will enable marketers to implement consistent marketing strategies across social media platforms. Moreover, will have the knowledge of search engine optimization (SEO) and other web analytics. In addition, will be able to work collaboratively to identify social media content, topics and information flow. Alongside holding the degree offered by the university, students will graduate with a professional degree (i.e., Certified Digital Marketing Associate) resulting from the university's partnership with the Digital Marketing Institute (DMI).

Program Structure
All students pursuing the BBA in Marketing and Social Media must complete a minimum of 125 credits with a cumulative minimum GPA of 2.0. Specific requirements are:

- A minimum of 38 credits of General Education Requirements
- A minimum of 39 credits of Business Core Requirements
- A minimum of 36 credits of Major Requirements
- A minimum of 6 credits of Major Electives Requirements
- A minimum of 6 credits of Professional Elective Requirements

General Education Requirements (38 credits)
The following courses constitute the General Education Requirements for the BBA in Marketing and Social Media:

<u>English Requirements (6 credits)</u>

ENGL 101	Composition I	(3 credits)
ENGL 102	Composition II	(3 credits)

<u>National Requirements (7 credits)</u>

ARHG 104/101	Arabic for Arabic Speakers/Arabic for non-Arabic speakers	(3 credits)
ARHG 107	Human Rights	(2 credits)
ARHG 106	Modern History of Bahrain	(2 credits)

<u>Mathematics Requirements (6 credits)</u>

MATH 115	Introduction to Probability and Statistics	(3 credits)

Choose one course:

MATH 130*	College Algebra	(3 credits)
MATH 131*	Finite Math with Calculus	(3 credits)

*Students can be exempted from these courses if they successfully completed any 100 level (NQF level 5) university math course

<u>ICT Requirements (3 credits)</u>

COSC 101	Introduction to Computing	(3 credits)

<u>Lifelong Learning Requirements (1 credit)</u>

UNSS 101 University Success (1 credit)

Arts and Humanities Requirements (3 credits) – Choose one course

Students may choose any of the course that satisfies the Art and Humanities Requirements approved by the Division of Art & Science. For example, world history, humanities, public speaking, and others.

Natural Science Requirements (4 credits) – Choose one course and its lab
Examples of course subjects that satisfy the Natural Sciences Requirements include Biology, Chemistry, Geology, and Physics. Other courses may be considered if approved by the academic unit in advance.

Social and behavioral Science Requirements (3 credits)
ENGL 205 Business Communication (3 credits)

General Education electives (5 credits)
A maximum of 5 credits can be taken from any of the general education courses (free general education electives).

Business Core Requirements (39 Credits)

The following courses constitute the business core requirements for the BBA in Marketing and Social Media:

- ACCT 201 Introduction to Financial Accounting (3 credits)
- ACCT 202 Introduction to Managerial Accounting (3 credits)
- BUSN 101 Introduction to Business (3 credits)
- BUSN 301 Business Law (3 credits)
- ECON 201 Principles of Microeconomics (3 credits)
- ECON 202 Principles of Macroeconomics (3 credits)
- FINC 201 Essentials of Financial Analysis (3 credits)
- MGMT 101 Principles of Management (3 credits)
- MGMT 205 Organizational Behavior (3 credits)
- MGMT 350 Business Ethics (3 credits)
- MGMT 410 Business Policy and Strategic Management (3 credits)
- MRKG 101 Principles of Marketing (3 credits)
- MSYS 201 Principles of Management Information Systems (3 credits)

Major Requirements (36 credits)
The following courses constitute the Major Requirements for the BBA in Marketing and Social Media program:

- DSGN 141 Computer Culture I (3 credits)
- DSGN 412 Media Law and Ethics (3 credits)

- MRKG 421 Data Analytics and Visualization (3 credits)
- MGMT 430 Project Management for Creative Industries (3 credits)
- MRKG 201 Consumer Behavior (3 credits)
- MRKG 202 Online Marketing Channels (3 credits)
- MRKG 401 Principles of Marketing Research (3 credits)
- MRKG 302 Marketing Strategy and Planning in a Digital World (3 credits)
- MRKG 480 Marketing Internship (3 credits)
- MRKG 431 Contemporary Issues in Social Media Campaigns (3 credits)
- MRKG 499 Marketing and Social Media Project (6 credits)

Major Elective Requirements (6 credits)
Students pursuing a BBA in Marketing and Social Media must complete a minimum of 6 elective credits which are either from the Design courses (DSGN) or from Business courses (MGMT/HOSP) offered at or above the 200 level and which are not considered courses within the Major Requirements:

- MGMT 305 International Business (3 credits)
- MGMT 313 Managing Change and Innovation (3 credits)
- MRKG 310 Integrated Marketing Communications in a Digital World (3 credits)
- BUSN 410 Artificial Intelligence for Business (3 credits)
- MGMT 404 Technology Entrepreneurship (3 credits)
- DSGN 301 Web Design (3 credits)
- MRKG 410 Services Marketing (3 credits)

Professional Elective Requirements (6 credits)
Students pursuing a BBA in Marketing and Social Media must complete a minimum of 6 Professional Elective credits. Professional Elective credits may be earned via any courses offered at or above the 200 level.

Master in Business Administration (MBA)

Objectives of the Program

The MBA program aims to develop candidates' critical thinking, analytical and problem-solving skills that professionals need to manage strategic decisions, processes, and people in multi-cultural, fast-paced, and international business contexts. The MBA program facilitates relevant business-driven research for professionals across diverse sectors. This is possible by ensuring scholarly rigor and theoretical understanding of management concepts are reached in core and elective courses.

MBA candidates will be exposed to global business thinking in core disciplines of management, strategy, finance, human resources, and economics. The MBA program encourages and engages graduate learning by connecting theoretical concepts to real-life business scenarios and draws on candidate's lived experiences in the professional world. The MBA has a keen focus on practice-led research, and this enables participants to develop deeper knowledge in their professional fields and apply techniques and tools, that can enhance organizational performance and management practice. The MBA objectives include:

- Develop critical thinking, analytical and problem-solving skills
- Develop professional acumen and network connections
- Implement leadership skills to work effectively within diverse teams
- Develop research projects from undefined problems and business cases using appropriate technical and analytical research tools
- Integrate management theories and practice, and research skills to perform rigorous and ethical research

Program Learning Outcomes

1. Demonstrate critical knowledge and understanding of core and specialized theories, principles, and processes in contemporary business and management subjects such as data analytics and data mining, strategic management and innovation, leadership and team development, human resource management, cross-cultural management, operations, marketing, economics, and finance.
2. Apply core and specialized theoretical concepts, ethical practices, methods, and analytical techniques with elements of creativity and originality in different business and management settings.
3. Critically analyze and solve complex managerial problems using core knowledge and empirical data to inform solutions and decision making in varied business disciplines and settings.
4. Demonstrate professional levels of analysis, interpretation, and originality in addressing complex managerial and business-related issues.
5. Demonstrate a professional level of written and oral communication skills, including the ability to present sound and coherent arguments for a range of audiences with different levels of knowledge or expertise in different business contexts.
6. Use a range of standard and specialized analytical tools and information technology applications to analyze and synthesize quantitative and qualitative data in business and management research projects.
7. Critically evaluate numerical and graphical data to address business performance that can be understood by a range of stakeholders.

8. Operate at a professional level with substantial responsibility for individual and group work activities on complex and undefined problems in varied business and management scenarios.
9. Demonstrate a professional level of reflexivity, strategic decision making, and peer review during business and management projects.

Program Structure
All candidates pursuing the MBA must complete a minimum of 33 credits with a cumulative GPA of 3.0 or higher. Specifically, the requirements are as follows:

- Up to two Foundation Courses with zero credits towards the degree (Foundation in Economics/ Foundation in Statistics, if applicable)
- A minimum of 18 credits of Major Requirements
- A minimum of 9 credits of Major Electives
- A minimum of 6 credits of MBA Thesis

Core Courses (18 credits + 6 credits Thesis)
- BUSN 510 Intercultural Communication in Business (3 credits)
- BUSN 515 Introduction to Data Analysis for Decision-Making (3 credits)
- MGMT 513: Leadership Development and Team Building (3 credits)
- FINC 536: Corporate Finance for a Global Environment (3 credits)
- ECON 510: Managerial Economics and Business Analytics (3 credits)
- MGMT 520: Operations Management in Global Supply Chains (3 credits)
- BUSN 599: Final Thesis Project

Major elective courses (9 credits)
Select <u>three courses</u> from the list below or any other graduate course(s) approved by the department):
- MGMT 530: People Analytics for Leaders (3 credits)
- MRKG 515: Marketing Management & Strategy (3 credits)
- BUSN 520 Business Data Mining and Predictive Analytics (3 credits)
- MGMT 532: Global Strategic Management and Innovation (3 credits)

*Candidates who have not taken Economics and/or Statistics/Research Methods during their previous studies, might have to take one or more of the following foundation courses prior to their enrollment or while undertaking the MBA program:
- ECON 311 Foundation in Economics
- BUSN 411 Foundation in Research Methods
- MATH 311 Foundation in Business Statistics

COLLEGE OF MEDIA AND DESIGN

Mission and Objectives of the College of Media and Design

The mission of the College of Media and Design is to develop technically competent, aesthetically sensitive, and socially responsible professionals prepared for a changing, global society. In support of the mission of American University of Bahrain, the fundamental objectives of the College of Media and Design are as follows:

- Develop a broad-based, interdisciplinary foundation in the liberal arts, sciences, and humanities
- Develop the verbal, written, and visual skills necessary for the effective communication of ideas
- Develop individual design and media production abilities that effectively integrate technology, function, and aesthetics
- Develop an enlightened sense of design media production
- Develop a strong sense of professional ethics and beliefs
- Provide leadership service for a pluralistic society

Why Multimedia Design?

Designers with capabilities across multimedia have the creative world open to them, with opportunities in graphics, illustration, web, gaming, film and video, social media and photography to name a few. The entire world engages with every aspect of modern life through various forms of media, and it is the creators behind this imagery, videography, and innovative art that we are shaping through our courses. Multimedia is also non-specific by industry, meaning that the skills and knowledge possessed by these versatile designers can offer careers in literally any sector or organization – the sky's the limit.

Program Learning Outcomes

1. Demonstrate critical knowledge of theory, elements, and principles of multimedia design.
2. Identify the major cultural and ethical components of multimedia design, as well as its history and aesthetics.
3. Utilize the various production techniques and methods in multimedia design.
4. Adhere to the discipline's ethical codes and contribute to the development profession.
5. Employ the skills necessary to review, analyze and critically evaluate literature; to conduct original research; to draw and report conclusions.
6. Utilize analytical skills by reviewing, critiquing, evaluating professional works; synthesize information in the field of multimedia.
7. Define and analyze multimedia design problems; develop innovative and creative design solutions, meeting regional and international standards.
8. Demonstrate the ability to use industry standard multimedia design software.
9. Communicate effectively and creatively in both writing and presentations, as well as by combining multi-media image, sound, video, animation and text.
10. Demonstrate leadership qualities, entrepreneurship, and strong professional work ethics.
11. Employ soft-skills and self-confidence; work effectively independently and in a team.
12. Understand various career development options and make informed choices.

Graduate Profile

Graduates will have comprehensive understanding, knowledge, and skills across multimedia design disciplinary. These include problem solving, creativity, and critical thinking to perceive innovative ideas. They will apply professional production values, and response to a variety of audiences and contexts.—Graduates will be involved in professional fields and have the potential to be entrepreneurial, also will have awareness of global intercultural and ethical competency.

Bachelor of Arts in Multimedia Design

The Bachelor of Arts in Multimedia Design is a 4-year undergraduate curriculum that develops the knowledge and skills which provide students with qualifications to establish careers in a wide range of public- and private-sector industries, both in Bahrain and abroad. The possibilities include acquiring professional positions in media, advertising, business marketing and public relations, , film, television, entertainment and video gaming, and online, interactive training networks, to name just a few. The Bachelor of Arts in Multimedia Design gives students the opportunity to specialize in multimedia design, mass communication, production, or advertising. Each degree option develops a solid base of multimedia skills and knowledge, encompassing interface design, 2-D animation, video production, Web-based design, digital audio, and hands-on experience with real-world multimedia production. This knowledge is further enhanced by majors in a chosen field of specialization, selecting from subject areas such as film and television, journalism, communication, and advertising.

All students pursuing the Bachelor of Arts in Multimedia Design must complete a minimum of 125 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of 38 credits of general education requirements
- A minimum of 39 credits of design core requirements
- A minimum of 30 credits of major requirements
- A minimum of 9 credits of major electives
- A minimum of 9 credits of professional elective options

General Education Requirements (38 credits)

National Requirements*		**(7 Credits)**
ARHG 101/104	Arabic for Non-Arabic/Arabic Speakers*	(3 Credits)
ARHG 106	Modern History of Bahrain *	(2 Credits)
ARHG 107	Human Rights*	(2 Credits)

English Requirements		**(6 Credits)**
ENGL 101	Composition I	(3 Credits)
ENGL 102	Composition II	(3 Credits)

Social and Behavioral Science Requirements (3 Credits)

ENGL 205	Business Communication	(3 Credits)

Mathematics Requirements (3 Credits)

MATH 115	Introduction to Probability and Statistics	(3 Credits)

ICT Requirements (3 Credits)

COSC 101	Introduction to Computing	(3 Credits)

Lifelong Learning Requirements (1 Credit)

UNSS 101	University Skills	(1 Credit)

Natural Science Requirements (4 Credits)

Students should complete a minimum of 4 credits, including at least 1 credit lab from the Natural Science list of the general Education tabulated below.

Arts and Humanities Requirements (3 Credits)

CMAD 201	Visual Culture I	(3 Credits)

General Education Electives (8 Credits)

A minimum of 8 credits can be taken from any of the general education courses from any of the lists tabulated below:

Mathematics List

MATH 130	Calculus with Business Applications	(3 Credits)
MATH 131	Finite Math with Calculus	(3 Credits)
MATH 153	Calculus for Engineering Majors I	(3 Credits)
MATH 154	Calculus for Engineering Major II	(4 Credits)
MATH 252	Calculus for Engineering Major III	(3 Credits)

Arts and Humanities List

ANTH 152	Introduction to Cultural Anthropology	(3 Credits)
HUM 101	Forms and Ideas in the Humanities	(3 Credits)
HIST 201	World History	(3 Credits)
TURK 101	Turkish for Beginners	(3 Credits)
COMS 151	Public Speaking	(3 Credits)
CCHN 101	Spoken Mandarin	(3 Credits)
COMS 356	Intercultural Communication	(3 Credits)

PHIL 101	Introduction to Philosophy	(3 Credits)
CULT 101	Cultural Criticism	(2 Credits)

Natural Sciences List

BIOL 101	Introduction to Cultural Anthropology	(3 Credits)
BIOL 101L	Forms and Ideas in the Humanities	(1 Credit)
CHEM 103	General Chemistry	(3 Credits)
CHEM 103L	General Chemistry Lab	(1 Credit)
CHEM 101	Introductory Chemistry	(3 Credits)
CHEM 101L	Introductory Chemistry Lab	(1 Credit)
ASTR 352	Current Development in Astronomy	(3 Credits)
ASTR 352L	Current Development in Astronomy Lab	(1 Credit)
PHYS 101	Principles of Physics I	(3 Credits)
PHYS 101L	Principles of Physics I Lab	(1 Credit)
PHYS 102	Principles of Physics II	(3 Credits)
PHYS 102L	Principles of Physics II Lab	(1 Credits)

Social and Behavioral Sciences List

PSYC 101	Introduction to Psychology	(3 Credits)
SOCS 101	Introduction to Sociology	(3 Credits)
SUST 101	Principles of Sustainability	(3 Credits)
POLS 321	Comparative Political Ideologies	(3 Credits)

General Education Professional Electives List

MATH 254	Introduction to Linear Algebra	(3 Credits)
MATH 203	Discrete Mathematics	(3 Credits)
MATH 260	Probability and Statistics	(3 Credits)

Core Requirements (39 credits)

- DSGN 111 Basic Design I (3 credits)
- DSGN 112 Basic Design II (3 credits)
- CMAD 141 Digital Media I (3 credits)

- CMAD 142 Digital Media II (3 credits)
- CMAD 121 History of Media, Art, and Design (3 credits)
- CMAD 131 Introduction to Mass Communication (3 credits)
- CMAD 211 Photography Techniques (3 credits)
- CMAD 261 Video Production I (3 credits)
- DSGN 301 Web Design (3 credits)
- DSGN 221 Introduction to Multimedia (3 credits)
- CMAD 412 Media Law and Professional Ethics (3 credits)
- CMAD 431 Entrepreneurship for Media and Design (3 credits)
- CMAD 495 Foundation Media Research Methods (3 credits)

Major Requirements (18 credits)

- DSGN 232 Digital Vector Graphics (3 credits)
- DSGN 301 Web Design (3 credits)
- DSGN 331 Multimedia Design & Production (3 credits)
- DSGN 332 Multimedia Production (3 credits)
- DSGN 341 3-D Computer Graphics (3 credits)
- DSGN 201 Typography (3 credits)
- DSGN 244 Digital Image Processing (3 credits)
- DSGN 411 Physical Interaction Design (3 credits)
- DSGN 323 Sound and Image (3 credits)
- DSGN 401 Capstone Project (6 credits)
- DSGN 405 Multimedia Design Internship (3 credits)

Major Electives (9 Credits)

Students pursuing Bachelor of Arts in Multimedia Design must complete a minimum of nine elective credits in design (DSGN) coursework offered at or above the 200-level and which are not considered courses within the major requirements.

- DSGN 210 Digital Storytelling (3 credits)
- DSGN 241 Concept Development (3 credits)
- DSGN 319 Composition and Digital Effects (3 credits)
- CMAD 202 Visual Culture II (3 credits)
- CMAD 233 Fundamentals of Advertising (3 credits)
- CMAD 312 Photography Workshop (3 credits)
- CMAD 362 Video Production II (3 credits)
- DSGN 302 Interactive Web Projects (3 credits)
- DSGN 319 Composition and Digital Effects (3 credits)

Professional Elective Options (9 Credits)

Students pursuing a Bachelor of Arts in Multimedia Design must complete a minimum of 9 elective credits. Elective credits can be earned via any courses offered at or above the 100-level.

Internship (3 Credits)

To qualify for the Bachelor of Arts in Multimedia Design, a student must fulfill the internship requirements prior to graduation. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical setting. Internships are evaluated by the internship coordinator with a pass/fail grade.

The internship course is 3 credits and has a 90 Credits and a minimum CGPA of 2.00 to be able to register in. A working week is equivalent to 5 days of work with 7-8 hours per day.

COLLEGE OF ENGINEERING AND COMPUTING

Bachelor of Science in Computer Engineering

The Bachelor of Science in Computer Engineering is a 4-year undergraduate curriculum that aims at producing the best-skilled, hands-on, practicing computer engineer. More specifically, the objectives are:

1. To equip students with the technical knowledge and skills that will enable them to have a successful career in the computer engineering profession.
2. To provide students with a general education that will enable them to appreciate the social, ethical, economic, and environmental dimensions of problems they may face.
3. To develop students' communication skills and social skills that are necessary to work effectively with others.
4. To develop students' ability to solve problems by analyzing what is already known and then applying logic and creativity to find a solution.
5. To equip students with the intellectual skills necessary to continue learning and to stay current with the profession as it changes.

Why a student should take this program?

The Bachelor of Science in Computer Engineering combines, intensively, both sides of computer systems: software and hardware. This prepares the graduates for success in a broad range of jobs within the information and communication hyper-industry.

The program focusses on the integration of a strong mathematics, sciences, electronics, and computing preparation with a wide range of skills such as communicating effectively, functioning collaboratively on a team, and applying new knowledge, among others. Also, it emphasizes the development of ethical, socially responsible, and global attitudes. All this together brings our graduates a variety of career choices and job opportunities in today's high-tech society, an ever-expanding field.

Program Learning Outcomes

1. Identify, formulate, and solve complex engineering problems by applying principles of knowledge of science, mathematics and electrical & computer engineering.
2. Ability to Apply engineering and IT design to design reliable systems, devices or processes from initial specifications to a deliverable system, that meet specified needs but always with care and consideration for public health, safety and welfare, as well as for global, cultural, social, environmental.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering and IT situations and make informed judgments, which must consider the impact of engineering and IT solutions to global, economic, environmental and societal contexts.

5. Function effectively as part of a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
6. Develop and conduct appropriate experimentation, analysis and interpretation of data, and use scientific judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

General Description of Graduate Profile

Computer engineering graduates acquire a strong mathematical, sciences, electronics and computing basis. These graduates also develop skills at communicating effectively, functioning collaboratively on a team, adapting to change, evaluating own strengths and weaknesses, acting ethically, balancing local and global perspectives, developing experimentation, applying new knowledge, monitoring economic impacts, analyzing, designing and making decisions with consideration of sustainability and solving complex engineering problems.

Computer engineers are able to tackle in depth both sides of computer systems (and devices): hardware and software. And they do it at different levels: test, development, optimization, implementation, maintenance, analysis and design.

Course List

All students pursuing the Bachelor of Science in Computer Engineering must complete a minimum of 124 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of (39) credits of General Education Requirements
- A minimum of (40) credits of Computing Requirements
- A minimum of (30) credits of Major Requirements
- A minimum of (9) credits of Major Electives
- A minimum of (6) credits of Professional Elective Options
- Graduate Portfolio

GENERAL EDUCATION REQUIREMENTS (39 credits)

National Requirements*		**(7 Credits)**
ARHG 101/104	Arabic for Non-Arabic/ Arabic Speakers*	(3 Credits)
ARHG 106	Modern History of Bahrain *	(2 Credits)
ARHG 107	Human Rights*	(2 Credits)

English Requirements		**(6 Credits)**
ENGL 101	Composition I	(3 Credits)
ENGL 102	Composition II	(3 Credits)

Mathematics Requirements		**(8 Credits)**
MATH 153	Calculus I	(4 Credits)
MATH 154	Calculus II	(4 Credits)

ICT Requirements		**(3 Credits)**
COSC 101	Introduction to Computing	(3 Credits)

Lifelong Learning Requirements (1 Credit)

UNSS 101 University Skills (1 Credit)

Natural Science Requirements (8 Credits)

Students should complete a minimum of 8 credits, including at least 2 credit labs from the Natural Science list of the General Education below or any other science courses approved by the College of Arts and Science and the College of Engineering and Computing.

CHEM 101 Introductory Chemistry (3 credits)
CHEM 101L Introductory Chemistry Laboratory (1 credit)
PHYS 101 Principles of Physics I (3 credits)
PHYS 101L Principles of Physics I Laboratory (1 credit)

Arts and Humanities Requirements (3 Credits)

Students should complete a minimum of 3 credits from the list below or any other arts and humanities course approved by the College of Arts and Sciences.

- TURK 101 Turkish for Beginners (3 credits)
- CCHN 101 Spoken Mandarin (3 credits)
- PHIL 101 Introduction to Philosophy (3 credits)
- ANTH 152 Introduction to Cultural Anthropology (3 credits)
- HUMS 101 Forms and Ideas in the Humanities (3 credits)
- HIST 201 World History (3 credit)
- ENGL 103 Public Speaking (3 credits)
- COMS 356 Intercultural Communication (3 credits)

Social and Behavioral Science Requirements (3 Credits)

Students should complete a minimum of 3 credits from the list below or any other social and behavioral science course approved by the College of Arts and Sciences.

- PSYC 101 Introduction to Psychology (3 Credits)
- SOCS 101 Introduction to Sociology (3 Credits)
- ENGL 205 Business Communication (3 Credits)
- SUST 101 Principles of Sustainability (3 Credits)
- POLS 321 Comparative Political Ideologies (3 credits)

Computing Requirements (40 credits)

The following courses constitute the Computing Requirements for the Bachelor of Science in Computer Engineering:

- COSC 102 Object-Oriented Programming (3 Credits)
- COSC 125 Data Structure and Programming Techniques (3 Credits)
- MATH 203 Discrete Mathematics (3 credits)
- CMPE 215 Communication Networks (3 credits)

- ENGR 205 Multidisciplinary Research Methods (2 credits)
- MATH 255 Introduction to Linear Algebra (3 credits)
- MATH 260 Probability and Statistics (4 credits)
- CMPE 270 Digital Systems (3 credits)
- CMPE 270L Digital Systems Laboratory (1 credit)
- CMPE 271 Computer Organization (3 credits)
- COSC 312 Design and Usage of Databases (3 credits)
- COSC 372 Operating Systems (3 credits)
- COSC 372L Operating Systems Laboratory (1 credit)
- SWEN 360 Software Design and Engineering (3 credits)
- ENGR 401 Entrepreneurship for Engineers (2 credits)

Major Requirements (30 credits)
The following courses constitute the Major Requirements for the Bachelor of Science in Computer Engineering:

- PHYS 102 Principles of Physics II (3 Credits)
- PHYS 102L Principles of Physics II Laboratory (1 Credit)
- ENGR 202 Engineering Mathematics (3 credits)
- ELEC 320 Circuit Analysis (3 credits)
- CMPE 410L Computer Engineering Professional Certificate (1 credit)
- CMPE 470 Digital Circuits (3 credits)
- CMPE 412 Microprocessors (3 credits)
- CMPE 478 Embedded Systems Programming (3 credits)
- CMPE 499A Engineering Design: Capstone Project I (1 credit)
- CMPE 499B Engineering Design: Capstone Project II (3 credits)
- ELEC 330 Fundamentals of Engineering Electronics (3 credits)
- CMPE 406 Computer Engineering Internship (3 credits)

Major Electives (9 credits)
Students pursuing the Bachelor of Science in Computer Engineering must complete a minimum of 9 elective credits from the following list or any other course approved by the College of Engineering and Computing:

- CYBR 470 Cryptography (3 credits)
- CMPE 482 Robotics (3 credits)
- DSAI 474 Computer Vision (3 credits)
- CMPE 425 Advanced IoT (3 credits)
- CMPE 467 Network Management (3 credits)

Professional Electives (6 credits)
Students pursuing the Bachelor of Science in Computer Engineering must complete a minimum of 6 elective credits from general education course or any other programs at 200 level or above.

Internship (3 credits)

To qualify for the Bachelor of Science in Computer Engineering, a student must fulfill the internship requirements prior to graduation. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical setting. The internship consists of a minimum of 280 work hours (8 weeks) for fourth-year students with an approved employer. Internships are evaluated by the internship coordinator with a pass/fail grade.

Total number of units: 124

Bachelor of Science in Computer Science

The Bachelor of Science in Computer Science consists of a 4-year undergraduate curriculum that aims to produce practicing computer scientists with the highest level of skills in the industry. More specifically, the objectives of the program are

1. to provide students with the technical knowledge and skills which will enable them to have a successful career in the computer science profession
2. to provide students with a general education that will enable them to appreciate the social, ethical, economic, and environmental dimensions of problems they may be faced with
3. to develop students' communication and social skills which are essential for working effectively in a group
4. to develop students' ability to solve problems by applying logic and creativity to what they have learned in order to find a solution
5. to provide students with the intellectual skills necessary for continuous learning in order to keep up with the constantly evolving industry.

Why a Student Should Take this Program?

The Bachelor of Science in Computer Science intensively combines theoretical knowledge with practical skills, enabling students to understand the principles of computing and apply them to real-world problems. This prepares graduates for success in a broad range of jobs within the information and communication hyper-industry. The program focuses on the integration of strong mathematics, sciences, and computing preparation with a wide range of skills such as communicating effectively, functioning collaboratively in a team and applying new knowledge, among others. It also emphasizes the development of ethical, socially responsible and global attitudes. All these together bring to our graduates a variety of career choices and job opportunities in today's high-tech society, in an ever-expanding field.

Program Learning Outcomes

1. Demonstrate critical knowledge and understanding of mathematics and current technical concepts and practices in the core of computing.
2. Critically analyze the complexity of real problems, identify, define the computing requirements appropriate to its solution, and evaluate the performance.
3. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline
4. Communicate effectively in a variety of professional contexts

5. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
6. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
7. Apply computer science theory and software development fundamentals to produce computing-based solutions.

General Description of Graduate Profile

Computer Science graduates acquire a strong mathematical, sciences, electronics and computing basis. These graduates also develop skills at communicating effectively, functioning collaboratively in a team, adapting to change, evaluating own strengths and weaknesses, acting ethically, balancing local and global perspectives, developing experimentation, applying new knowledge, monitoring economic impacts, analyzing, designing and making decisions with consideration of sustainability and solving complex IT problems. Computer scientists are able to tackle in depth both sides of computer systems (and devices): hardware and software. They do it at multiple levels: testing, development, optimization, implementation, maintenance, analysis and design.

Course List

All students pursuing the Bachelor of Science in Computer Science must complete a minimum of 127 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of (39) credits of General Education Requirements
- A minimum of (40) credits of Computing Requirements
- A minimum of (33) credits of Major Requirements
- A minimum of (9) credits of Major Electives
- A minimum of (6) credits of Professional Elective Options
- Graduate Portfolio

GENERAL EDUCATION REQUIREMENTS (39 credits)

National Requirements*		**(7 Credits)**
ARHG 101/104 Arabic for Non-Arabic/ Arabic Speakers*		(3 Credits)
ARHG 106	Modern History of Bahrain *	(2 Credits)
ARHG 107	Human Rights*	(2 Credits)
English Requirements		**(6 Credits)**
ENGL 101	Composition I	(3 Credits)
ENGL 102	Composition II	(3 Credits)
Mathematics Requirements		**(8 Credits)**
MATH 153	Calculus I	(4 Credits)
MATH 154	Calculus II	(4 Credits)

ICT Requirements (3 Credits)

COSC 101 Introduction to Computing (3 Credits)

Lifelong Learning Requirements (1 Credit)

UNSS 101 University Skills (1 Credit)

Natural Science Requirements (8 Credits)

Students should complete a minimum of 8 credits including at least 2 credits lab from the list below or any other science course approved by the College of Arts and Sciences and the College of Engineering

- CHEM 101 Introductory Chemistry (3 credits)
- CHEM 101L Introductory Chemistry Laboratory (1 credit)
- PHYS 101 Principles of Physics I (3 credits)
- PHYS 101L Principles of Physics I Laboratory (1 credit)
- BIOL 101 Principles of Biology I (3 credits)
- BIOL 101L Principles of Biology I Laboratory (1 credit)
- PHYS 102 Principles of Physics II (3 credits)
- PHYS 102L Principles of Physics II Laboratory (1 credit)
- ASTR 352 Current Development in Astronomy (3 credits)
- ASTR 352 Current Development in Astronomy Laboratory (1 credits)

Arts and Humanities Requirements (3 Credits)

Students should complete a minimum of 3 credits from the list below or any other Arts and Humanities course approved by the College of Arts and Sciences

- TURK 101 Turkish for Beginners (3 credits)
- CCHN 101 Spoken Mandarin (3 credits)
- PHIL 101 Introduction to Philosophy (3 credits)
- ANTH 152 Introduction to Cultural Anthropology (3 credits)
- HUMS 101 Forms and Ideas in the Humanities (3 credits)
- HIST 201 World History (3 credits)
- ENGL 103 Public Speaking (3 credits)
- COMS 356 Intercultural Communication (3 credits)

Social and Behavioral Science Requirements (3 Credits)

Students should complete a minimum of 3 credits from the list below or any other social science course approved by the College of Arts and Sciences

- PSYC 101 Introduction to Psychology (3 credits)
- SOCS 101 Introduction to Sociology (3 credits)
- ENGL 205 Business Communication (3 credits)
- SUST 101 Principles of Sustainability (3 credits)
- POLS 321 Comparative Political Ideologies (3 credits)

GRADUATE PORTFOLIO

The American University of Bahrain recognizes the importance of curricular and non-curricular activities in developing graduate attributes. Hence, students are required to compile a portfolio of evidence showing their development throughout their educational journey. The portfolio is expected to include just a sample of activities that the student considers significant to his/her learning. The graduation portfolio aims to:

- Provide an insight into the student's personality and areas of interest
- Showcase the student's work and development over time
- Encourage students to engage in their wider academic and social context
- Encourage students to reflect on their own learning and development
- Promote AUBH graduates to employers

Computing Requirements (40 credits)

The following courses constitute the Computing Requirements for the Bachelor of Science in Computer Science:

COSC 102	Object-Oriented Programming	(3 credits)
MATH 255	Introduction to Linear Algebra	(3 credits)
MATH 203	Discrete Mathematics	(3 credits)
COSC 125	Data Structure and Programming Techniques	(3 credits)
CMPE 270	Digital Systems	(3 credits)
CMPE 270L	Digital Systems Laboratory	(1 credit)
CMPE 271	Computer Organization 1	(3 credits)
MATH 260	Probability and Statistics	(4 credits)
COSC 312	Design and Usage of Database	(3 credits)
COSC 372	Operating Systems	(3 credits)
COSC 372L	Operating System lab	(1 credit)
COSC 379	Numerical Analysis	(3 credits)
SWEN 360	Software Design and Engineering	(3 credits)
ENGR 401	Entrepreneurship for Engineers	(2 credits)

Major Requirements (33 credits)

The following courses constitute the Major Requirements for the Bachelor of Science in Computer Science:

COSC 210	Management Information Systems	(3 credits)
COSC 248	Algorithms and Complexity	(3 credits)
DSAI 310	Introduction to Data Science	(3 credits)
COSC 406	Computer Science Internship	(3 credits)
SWEN 360L	Software Design and Engineering Laboratory	(1 credit)
CYBR 310	Introduction to Cybersecurity	(3 credits)
DSAI 465	Artificial Intelligence	(3 credits)
COSC 415	Cloud Computing	(3 credits)

CMPE 467	Network Management	(3 credits)
COSC 485	Web Engineering	(3 credits)
COSC 410L	Computer Science Professional Certificate	(1 credit)
COSC 499A	Computer Science Design Project A	(1 credit)
COSC 499B	Computer Science Design Project B	(3 credits)

MAJOR ELECTIVES (9 credits)

Students pursuing the Bachelor of Science in Computer Science must complete a minimum of 9 elective credits from the following or any other course approved by the College of Engineering and Computing:

DSAI 422	Data Mining	(3 credits)
CYBR 470	Cryptography	(3 credits)
COSC 412	Implementation of Database Systems	(3 Credits)
COSC 486	Mobile Programming	(3 credits)
DSAI 482	Big Data Technologies	(3 credits)
DSAI 474	Computer Vision	(3 credits)

Professional Electives (6 credits)

Students pursuing the Bachelor of Science in Computer Science must complete a minimum of 6 elective credits from general education course or any other programs at 200 level or above.

Internship (3 credits)

To qualify for the Bachelor of Science in Computer Science a student must fulfill the internship requirements prior to graduation. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical setting. The internship consists of a minimum of 280 work hours (8 weeks) with an approved employer. Internships are evaluated by the internship coordinator with a pass/fail grade.

Total number of units: 127

Bachelor of Science in Industrial Engineering

The Bachelor of Science in Industrial Engineering is a 4-year undergraduate curriculum that ensures the students' academic success and preparation for a productive industrial engineering career. The objective of the Bachelor of Science in Industrial Engineering is to foster a world-class industrial engineering education in collaboration with industry. The college is committed to graduate competent industrial engineers equipped with the proficiency to adapt to technological and societal changes, and who are poised to excel in the field. The program objectives are:

1) To equip students with a critical understanding of fundamental scientific and engineering principles relevant to industrial systems.
2) To prepare students for successful careers in industrial engineering by equipping them with the necessary skills, competencies, and practical experience relevant to the industry.
3) To Promote teamwork and collaboration with peers from different disciplines, emphasizing the multidisciplinary nature of engineering projects.
4) To foster excellence in the field of industrial engineering by promoting critical thinking, problem-solving, and decision-making skills, as well as instilling strong work ethic, professionalism, and ethical values in students.

The Bachelor of Science in Industrial Engineering curriculum accomplishes the integration of systems using appropriate analytical, computational, and experimental practices and including studies in the social sciences to ensure appropriate sensitivity to socially related problems.

Why should a student take this program?

This Bachelor of Science in Industrial Engineering combines technical and management skills making graduates the most flexible and versatile engineers. The program focusses on the integration of a strong mathematics, sciences, and computing preparation with a wide range of business applications, and the development of ethical, socially responsible, and global attitudes. All this together brings our graduates a variety of career choices and job opportunities in any sector.

Program Learning Outcomes

The Program Learning Outcomes (PLOs) are those required by the Engineering Accreditation Commission of ABET in its Criterion 3. PLOs are outcomes (1) through (7).

1. Identify, formulate and solve complex engineering problems by applying principles of knowledge of science, mathematics and electrical & computer engineering.
2. Apply engineering and IT design to design reliable systems, devices or processes from initial specifications to a deliverable system, that meet specified needs but always with care and

consideration for public health, safety and welfare, as well as for global, cultural, social, environmental.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering and IT situations and make informed judgments, which must consider the impact of engineering and IT solutions to global, economic, environmental and societal contexts.
5. Function effectively as part of a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
6. Develop and conduct appropriate experimentation, analysis and interpretation of data, and use scientific judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

General Description of Graduate Profile

Industrial engineering is concerned with the design, improvement, and installation of integrated systems of people, materials, information, equipment and energy. Graduates will design and manage processes, systems and organizations to make the best use of industrial resources such as workers, materials, equipment, and information. They combine technical and management skills to optimize processes and bring change through strategies such as cost reduction, time saving or productivity increasing, in any sector. Our graduates are ready to compete in a dynamic environment by being socially responsible, ethically focused, and globally oriented.

Course List

All students pursuing the Bachelor of Science in Industrial Engineering must complete a minimum of 125 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of (39) credits of General Education Requirements
- A minimum of (26) credits of Engineering Core Requirements
- A minimum of (45) credits of Major Requirements
- A minimum of (6) credits of Professional Elective Options
- A minimum of (9) credits of Major Electives
- Graduate Portfolio

All students pursuing the Bachelor of Science in Industrial Engineering must complete a minimum of:

General Education Requirements (39 credits)

English Requirements (6 credits)

ENGL 101	Composition I	(3 credits)
ENGL 102	Composition II	(3 credits)

National Requirements (7 credits)

ARHG 101	Arabic for non-Arabic speakers	(3 credits) or
ARHG 104	Arabic for Arabic speakers	(3 credits)
ARHG 106	Modern History of Bahrain	(2 credits)

ARHG 107 Human Rights (2 credits)

Mathematics Requirements (8 credits)
MATH 151 Calculus I (4 credits)
MATH 152 Calculus II (4credits)

ICT Requirements (3 credits)
COSC 101 Introduction to Computing (3 credits)

Lifelong Learning Requirements (1 credit)
UNSS 101 University Success (1 credit)

Natural Sciences Requirements (8 credits)
Students should complete a minimum of 8 credits, including at least 2 credit labs from the Natural Science list of the general Education below or any other science courses approved by the College of Arts and Science and the College of Engineering and Computing.

CHEM 101 Introductory Chemistry (3 credits)
CHEM 101L Introductory Chemistry Laboratory (1 credit)
PHYS 101 Principles of Physics I (3 credits)
PHYS 101L Principles of Physics I Laboratory (1 credits)

Arts and Humanities Requirements (3 Credits)
Students should complete a minimum of 3 credits from the list below or any other arts and humanities course approved by the College of Arts and Sciences.

- TURK 101 Turkish for Beginners (3 credits)
- CCHN 101 Spoken Mandarin (3 credits)
- PHIL 101 Introduction to Philosophy (3 credits)
- ANTH 152 Introduction to Cultural Anthropology (3 credits)
- HUMS 101 Forms and Ideas in the Humanities (3 credits)
- HIST 201 World History (3 credits)
- COMS 151 Public Speaking (3 credits)
- COMS 356 Intercultural Communication (3 credits)

Social Sciences Requirements (3 credits)
Students should complete a minimum of 3 credits from the list below or any other social and behavioral science course approved by the College of Arts and Sciences.

PSYC 101 Introduction to Psychology (3 credits)
SOCS 101 Introduction to Sociology (3 credits)
ENGL 205 Business Communication (3 credits)
SUST 101 Principles OF Sustainability (3 credits)
POLS 321 Comparative Political Ideologies (3 credits)

Graduate Portfolio

Students are also required to compile a portfolio of evidence showing their development throughout their educational journey. The portfolio is expected to include a sample of activities that the student considers significant to his/her learning. The graduation portfolio aims to:

- Provide an insight into the student's personality and areas of interest.
- Showcase the student's work and development over time.
- Encourage students to engage in their wider academic and social context
- Encourage students to reflect on their own learning and development.
- Promote AUBH graduates to employers.

Engineering Core Requirements (26 credits)

CIVL 200	Engineering Mechanics - Statics	(3 credits)
MATH 252	Calculus III	(4 credits)
PHYS 102	Principles of Physics II	(3 credits)
PHYS 102L	Principles of Physics II Laboratory	(1 credit)
ENGR 100	Introduction to Engineering	(1 credit)
ENGR 105	Programming for Engineers	(2 credits)
ENGR 202	Engineering Mathematics	(3 credits)
ENGR 205	Multidisciplinary Research Methods	(2 credits)
ENGR 342	Engineering Economics Analysis	(3 credits)
ENGR 401	Entrepreneurship for Engineers	(2 credits)
MECH 241	Engineering Materials	(2 credits)

Major Requirements (45 credits)

MATH 260 Probability and Statistics	(4 credits)
MECH 101 Solid Modeling I	(3 credits)
MECH 204 Thermofluids	(2 credits)
MECH204L Thermofluids Laboratory	(1 credit)
NDSE 301 Operations Research: Modeling	(3 credits)
NDSE 302 Stochastic and Probability Modeling	(4 credits)
COSC 390 Introduction to Machine Learning and Data Analytics	(3 credits)
NDSE 404 Design and Analysis of Experiments	(3 credits)
NDSE 306 Systems Simulation	(3 credits)
NDSE 412 Facilities Design and Planning	(3 credits)
NDSE 481 Safety Engineering	(3 credits)
NDSE 415 Supply Chain Management	(3 credits)
NDSE 423 Quality Engineering	(3 credits)
NDSE 499A Engineering Design: Capstone Project I	(2 credits)
NDSE 499B Engineering Design: Capstone Project II	(2 credits)
NDSE 406 Industrial Engineering Internship	(3 credits)

Major Electives (9 credits)

Students pursuing the Bachelor of Science in Industrial Engineering must complete a minimum of 9 elective credits from the following list or any other course approved by the College of Engineering and Computing:

At least two (2) courses from the following list:

MGMT 410	Business Policy and Strategic Management	(3 credits)
DSAI 465	Artificial Intelligence	(3 credits)
NDSE 480	Project Management	(3 credits)

At most one (1) course from the following list:

MECH 341	Manufacturing Processes	(3 credits)
MGMT 305	International Business	(3 credits)
MGMT 350	Business Ethics	(3 credits)
CIVL 355	Environmental Engineering	(3 credits)

Professional Electives (6 credits)

Students pursuing the Bachelor of Science in Industrial Engineering must complete a minimum of 6 elective credits from general education or any other program at 200 level or above.

Internship (3 credits)

To qualify for the Bachelor of Science in Industrial Engineering, a student must fulfill the internship requirements prior to graduation. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical setting. The internship consists of a minimum of 280 work hours (8 weeks) for with an approved employer. Internships are evaluated by the internship coordinator with a pass/fail grade.

Total number of units: 125

Bachelor of Science in Civil Engineering

Objectives of the Program

The Bachelor of Science in Civil Engineering is a 4-year undergraduate curriculum that ensures academic success and preparation for a productive career in engineering. The objective of the Bachelor of Science in Civil Engineering is to give the student a basic knowledge of civil, construction and environmental engineering, as well as the interdisciplinary background and skills to meaningfully participate in and contribute to technical advances towards this profession. The Bachelor of Science in Civil Engineering integrates technical aspects with studies in the social sciences to ensure appropriate sensitivity to socially related issues.

1. To Provide students with a critical understanding of civil, construction, and environmental engineering principles and practices.
2. To equip students with the necessary technical expertise and practical skills essential for a successful career in civil engineering, including hands-on experience with tools, software, and technologies used in the field.
3. To encourage collaboration with peers from different disciplines and develop an understanding of the multidisciplinary nature of engineering projects, preparing students to work effectively in diverse teams.
4. To foster ethical considerations, integrity, responsibility, and sustainable practices in civil engineering, emphasizing the importance of ethical behavior and promoting sustainable solutions in civil engineering projects.

Why a student should take this program

This Bachelor of Science in Civil Engineering combines technical and management skills making graduates the most flexible and versatile engineers. The department focuses on the integration of strong mathematics, sciences, and computing preparation with a wide range of business applications, and the development of ethical, socially responsible and global attitudes. The combination of aforementioned skills brings our graduates a variety of career choices and job opportunities in various sectors.

Program Learning Outcomes

The Program Learning Outcomes (PLOs) are those required by the Engineering Accreditation Commission of ABET in its Criterion 3. PLOs are outcomes (1) through (7).

1. Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
3. Communicate effectively with a range of audiences
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which consider the impact of engineering solutions in global, economic, environmental and societal contexts

5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
6. Develop and conduct appropriate experimentation, analysis and data interpretation, and use engineering judgment to draw conclusions
7. Acquire and apply new knowledge as needed, using appropriate learning strategies

General Description of Graduate Profile

Civil Engineering is concerned with the design, improvement and installation of integrated systems of people, materials, information, equipment and energy. Graduates will design and manage processes, systems and organizations to make the best use of industrial resources such as workers, materials, equipment and information. They combine technical and management skills to optimize processes and bring change through strategies such as cost reduction, time saving or productivity increasing, in any sector. Our graduates are ready to compete in a dynamic environment by being socially responsible, ethically focused and globally oriented.

Program Structure

All students pursuing the Bachelor of Science in Civil Engineering must complete a minimum of 130 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of (39) credits of General Education Requirements
- A minimum of (26) credits of Engineering Core Requirements
- A minimum of (50) credits of Major Requirements
- A minimum of (6) credits of Professional Elective Options
- A minimum of (9) credits of Major Electives
- Graduate Portfolio

GENERAL EDUCATION REQUIREMENTS (39 credits)

National Requirements*		**(7 Credits)**
ARHG 101/104 Arabic for Non-Arabic /Arabic Speakers*		(3 Credits)
ARHG 106	Modern History of Bahrain *	(2 Credits)
ARHG 107	Human Rights*	(2 Credits)
English Requirements		**(6 Credits)**
ENGL 101	Composition I	(3 Credits)
ENGL 102	Composition II	(3 Credits)
Mathematics Requirements		**(8 Credits)**
MATH 153	Calculus I	(4 Credits)
MATH 154	Calculus II	(4 Credits)
ICT Requirements		**(3 Credits)**

COSC 101	Introduction to Computing	(3 Credits)

Lifelong Learning Requirements (1 Credit)

UNSS 101	University Skills	(1 Credit)

Natural Science Requirements (8 Credits)

Students should complete a minimum of 8 credits, including at least 2 credit labs from the Natural Science list of the general Education below or any other science courses approved by the College of Arts and Science and the College of Engineering and Computing

CHEM 101 Introductory Chemistry	(3 credits)
CHEM 101L Introductory Chemistry Laboratory	(1 credit)
PHYS 101 Principles of Physics I	(3 credits)
PHYS 101L Principles of Physics I Laboratory	(1 credit)

Arts and Humanities Requirements (3 Credits)

Students should complete a minimum of 3 credits from the list below or any other arts and humanities course approved by the College of Arts and Sciences.

TURK 101 Turkish for Beginners	(3 credits)
CCHN 101 Spoken Mandarin	(3 credits)
PHIL 101 Introduction to Philosophy	(3 credits)
ANTH 152 Introduction to Cultural Anthropology	(3 credits)
HUMS 101 Forms and Ideas in the Humanities	(3 credits)
HIST 201 World History	(3 credits)
COMS 151 Public Speaking	(3 credits)
COMS 356 Intercultural Communication	(3 credits)

Social and Behavioral Science Requirements (3 Credits)

Students should complete a minimum of 3 credits from the list below or any other social and behavioral science course approved by the College of Arts and Sciences.

PSYC 101	Introduction to Psychology	(3 credits)
SOCS 101	Introduction to Sociology	(3 credits)
ENGL 205	Business Communication	(3 credits)
SUST 101	Principles of Sustainability	(3 credits)
POLS 321	Comparative Political Ideologies	(3 credits)

Graduate Portfolio

Students are also required to compile a portfolio of evidence showing their development throughout their educational journey. The portfolio is expected to include a sample of activities that the student considers significant to his/her learning. The graduation portfolio aims to:

- Provide an insight into the student's personality and areas of interest.
- Showcase the student's work and development over time.
- Encourage students to engage in their wider academic and social context
- Encourage students to reflect on their own learning and development.
- Promote AUBH graduates to employers.

ENGINEERING CORE REQUIREMENTS (26 credits)

The following courses constitute the Engineering Core Requirements for the Bachelor of Science in Civil Engineering:

ENGR 100 Introduction to Engineering	(1 credit)
ENGR 105 Programming for Engineers	(2 credits)
CIVL 200 Engineering Mechanics - Statics	(3 credits)
ENGR 202 Engineering Mathematics	(3 credits)
MATH 252 Calculus III	(3 credits)
PHYS 102 Principles of Physics II	(3 credits)
PHYS 102L Principles of Physics II Laboratory	(1 credit)
ENGR 342 Engineering Economic Analysis	(3 credits)
ENGR 401 Entrepreneurship for Engineers	(2 credits)
ENGR 205 Multidisciplinary Research Methods	(2 credits)
MECH 241 Engineering Materials	(2 credits)

MAJOR REQUIREMENTS (50 credits)

The following courses constitute the requirements for the Bachelor of Science in Civil Engineering:

CIVL 121	Computer Graphics for the Built Environment	(3 credits)
CIVL 210	Statistical Methods for the Built Environments	(3 credits)
CIVL 218	Surveying for Civil Engineering and Construction	(3 credits)
MECH 241L	Engineering Materials Laboratory	(1 credit)
CIVL 302	Mechanics of Materials	(3 credits)
CIVL 302L	Mechanics of Materials Laboratory	(1 credit)
CIVL 303	Engineering Geology	(3 credits)
CIVL 321	Structural Analysis I	(3 credits)
CIVL 330	Construction Engineering and Management	(3 credits)
CIVL 355	Environmental Engineering	(3 credits)
MECH 451	Fluid Mechanics	(3 credits)
MECH 451L	Fluid Mechanics Laboratory	(1 credits)
CIVL 421	Reinforced Concrete Design	(3 credits)
CIVL 462	Geotechnical Engineering	(3 credits)
CIVL 462L	Geotechnical Engineering Lab	(1 credit)
CIVL 465	Foundation Engineering and Earth Retaining Structures	(3 credits)
CIVL 481	Transportation Engineering	(3 credits)
CIVL 499A	Engineering Design: Capstone Project I	(2credits)

CIVL 499B	Engineering Design: Capstone Project II	(2 credits)
CIVL 406	Civil Engineering Internship	(3 credits)

Major Electives (9 credits)

Students pursuing the Bachelor of Science in Civil Engineering must complete a minimum of 9 elective credits from the following list or any other course approved by the College of Engineering and Computing:

CIVL 430	Advanced Project Management	(3 credits)
CIVL 441	Structural Analysis II	(3 credits)
CIVL 444	Applied Hydraulics	(3 credits)
CIVL 445	Applied Hydrology	(3 credits)
CIVL 483	Traffic Engineering Design	(3 credits)
CIVL 491	Construction Methods	(3 credits)

Professional Elective (6 credits)

Students pursuing the Bachelor of Science in Civil Engineering must complete a minimum of 6 elective credits from the following list or any other course approved by the College of Engineering and Computing:

Civil Engineering Internship (3 credits)

To qualify for the Bachelor of Science in Civil Engineering, a student must fulfill the internship requirements prior to graduation. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical setting. The internship consists of a minimum of 280 work hours (8 weeks) with an approved employer. Internships are evaluated by the internship coordinator with a pass/fail grade.

Total number of units: 130

Bachelor of Science in Mechanical Engineering

The Bachelor of Science in Mechanical Engineering consists of a 4-year undergraduate curriculum that prepares students for a wide range of careers and new technologies, as well as for advanced study. Mechanical engineers work on diverse, challenging problems that require the integration of science, engineering, and socio-economic knowledge. Mechanical engineering covers the design and analysis of all kinds of systems and technologies with mechanical components, with applications in energy production, robotics, environmental systems, materials, composites, transportation, manufacturing, machine design and many more areas. The program objectives are:

1. To provide students with a critical understanding of fundamental scientific and engineering principles related to mechanical systems.
2. To equip students with the necessary technical expertise and practical skills required for a career in mechanical engineering, including hands-on experience with tools, software, and technologies used in the field.
3. To encourage collaboration with peers from different disciplines and promote an understanding of the multidisciplinary nature of engineering projects.
4. To foster ethical considerations and professional standards in mechanical engineering, emphasizing integrity, responsibility, and sustainable practices.

Why should a student take this program?

This Bachelor of Science in Mechanical Engineering combines technical and management skills, making graduates the most flexible and versatile engineers. The program focuses on the integration of strong mathematics, sciences and computing preparation with a wide range of business applications, and the development of ethical, socially responsible and global attitudes. The combination of aforementioned skills brings our graduates a wide range of career choices and job opportunities in various sectors.

Program Learning Outcomes

The Program Learning Outcomes (PLOs) are those required by the Engineering Accreditation Commission of ABET in its Criterion 3. PLOs are outcomes (1) through (7).

1. Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
2. Apply engineering design to produce solutions that meet specified needs, with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
3. Communicate effectively with a range of audiences
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which take into consideration the impact of engineering solutions in global, economic, environmental and societal contexts
5. Function effectively in a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives

6. Develop and conduct appropriate experimentation, analysis and data interpretation, and use engineering judgment to draw conclusions
7. Acquire and apply new knowledge, using appropriate learning strategies

General Description of Graduate Profile

Mechanical engineering involves the design, improvement and installation of integrated systems of people, materials, information, equipment and energy. Graduates design and manage processes, systems and organizations to make the best use of industrial resources such as workers, materials, equipment and information. They combine technical and management skills to optimize processes and bring change through strategies such as cost reduction, time saving or productivity increasing, in any sector. Our graduates are ready to compete in a dynamic environment by being socially responsible, ethically focused and globally oriented.

Course List

All students pursuing the Bachelor of Science in Mechanical Engineering must complete a minimum of 132 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of (39) credits of General Education Requirements
- A minimum of (26) credits of Engineering Core Requirements
- A minimum of (52) credits of Major Requirements
- A minimum of (6) credits of Professional Elective Options
- A minimum of (9) credits of Major Electives
- Graduate Portfolio

GENERAL EDUCATION REQUIREMENTS (39 credits)

National Requirements*		**(7 Credits)**
ARHG 101/104	Arabic for Non-Arabic /Arabic Speakers*	(3 Credits)
ARHG 106	Modern History of Bahrain *	(2 Credits)
ARHG 107	Human Rights*	(2 Credits)

English Requirements		**(6 Credits)**
ENGL 101	Composition I	(3 Credits)
ENGL 102	Composition II	(3 Credits)

Mathematics Requirements		**(8 Credits)**
MATH 153	Calculus I	(4 Credits)
MATH 154	Calculus II	(4 Credits)

ICT Requirements (3 Credits)

COSC 101	Introduction to Computing	(3 Credits)

Lifelong Learning Requirements (1 Credit)

UNSS 101	University Skills	(1 Credit)

Natural Science Requirements (8 Credits)

Students should complete a minimum of 8 credits including at least 2 credits lab from the list below or any other science course approved by the Division of Arts and Science and the College of Engineering

CHEM 101 Introductory Chemistry	(3 credits)
CHEM 101L Introductory Chemistry Laboratory	(1 credit)
PHYS 101 Principles of Physics I	(3 credits)
PHYS 101L Principles of Physics I Laboratory	(1 credit)

Arts and Humanities Requirements (3 Credits)

Students should complete a minimum of 3 credits from the list below or any other arts and humanities course approved by the College of Arts and Sciences.

- TURK 101 Turkish for Beginners (3 credits)
- CCHN 101 Spoken Mandarin (3 credits)
- PHIL 101 Introduction to Philosophy (3 credits)
- ANTH 152 Introduction to Cultural Anthropology (3 credits)
- HUMS 101 Forms and Ideas in the Humanities (3 credits)
- HIST 201 World History (3 credits)
- COMS 151 Public Speaking (3 credits)
- COMS 356 Intercultural Communication (3 credits)

Social and Behavioral Science Requirements (3 Credits)

Students should complete a minimum of 3 credits including from the list below or any other social science course approved by the College of Arts and Science

PSYC 101	Introduction to Psychology	(3 credits)
SOCS 101	Introduction to Sociology	(3 credits)
ENGL 205	Business Communication	(3 credits)
SUST 101	Principles of Sustainability	(3 credits)
POLS 321	Comparative Political Ideologies	(3 credits)

Graduate Portfolio

Students are also required to compile a portfolio of evidence showing their development throughout their educational journey. The portfolio is expected to include a sample of activities that the student considers significant to his/her learning. The graduation portfolio aims to:

- Provide an insight into the student's personality and areas of interest.
- Showcase the student's work and development over time.
- Encourage students to engage in their wider academic and social context.
- Encourage students to reflect on their own learning and development.
- Promote AUBH graduates to employers.

ENGINEERING CORE REQUIREMENTS (26 credits)

The following courses constitute the Engineering Core Requirements for the Bachelor of Science in Civil Engineering:

ENGR 100	Introduction to Engineering	(1 credit)
ENGR 105	Programming for Engineers	(2 credits)
CIVL 200	Engineering Mechanics - Statics	(3 credits)
ENGR 202	Engineering Mathematics	(3 credits)
MATH 252	Calculus III	(3 credits)
PHYS 102	Principles of Physics II	(3 credits)
PHYS 102L	Principles of Physics II Laboratory	(1 credit)
ENGR 342	Engineering Economic Analysis	(3 credits)
ENGR 401	Entrepreneurship for Engineers	(2 credits)
ENGR 205	Multidisciplinary Research Methods	(2 credits)
MECH 241	Engineering Materials	(2 credits)

MAJOR REQUIREMENTS (52 credits)

The following courses constitute the Major Requirements for the Bachelor of Science in Mechanical Engineering:

ELEC 204	Principles of Electrical Engineering	(3 credits)
MECH 101	Solid Modeling I	(3 credits)
MECH 220	Engineering Mechanics - Dynamics	(3 credits)
MECH 241L	Engineering Materials Laboratory	(1 credit)
CIVL 302	Mechanics of Materials	(3 credits)
MECH 310	Introduction to Engineering Design	(3 credits)
MECH 313	Numerical Analysis of Engineering Systems	(3 credits)
MECH 314	Engineering Design: Mechanical Components	(3 credits)
MECH 458	Automatic Control Systems	(3 credits)
MECH 458L	Automatic Control Systems Laboratory	(1 credit)
MECH 341	Manufacturing Processes	(3 credits)
MECH 350	Thermodynamics	(3 credits)
MECH 451	Fluid Mechanics	(3 credits)
MECH 451L	Fluid Mechanics Laboratory	(1 credit)
MECH 406	Mechanical Engineering Internship	(3 credits)

MECH 453	Heat Transfer	(3 credit)
MECH 490L	Mechanical and Thermal Systems Laboratory	(1 credit)
MECH 499A	Engineering Design: Capstone Project I	(2 credit)
MECH 499B	Engineering Design: Capstone Project II	(2 credit)
MECH 496	Advanced Machine Design	(3 credit)
MECH 498	Thermal Systems Analysis and Design	(3 credit)

MAJOR ELECTIVES (9 credits)

Students pursuing the Bachelor of Science in Mechanical Engineering must complete a minimum of 9 elective credits from the following list or any other course approved by the College of Engineering and Computing:

MECH 457	Mechanical Vibrations	(3 credits)
MECH 440	Computer-Aided Manufacturing	(3 credits)
MECH 410	Heating, Ventilating and Air-Conditioning	(3 credits)
MECH 430	Industrial Management	(3 credits)
MECH 460	Computational Fluid Dynamics	(3 credits)
MECH 454	Renewable Energy and Sustainable Technology	(3 credits)
MECH 470	Machinery Fault Diagnosis and Signal Processing	(3 credits)

Professional Elective Options (6 Credits)

Students pursuing a Bachelor of Mechanical Engineering must complete a minimum of 6 elective credits from general educations courses or any other programs at 200 level or above.

Internship (3 Credits)

To qualify for the Bachelor of Science in Mechanical Engineering, a student must fulfill the internship requirements prior to graduation. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical setting. The internship consists of a minimum of 280 work hours (8 weeks) for fourth-year students with an approved employer. Internships are evaluated by the internship coordinator with a pass/fail grade.

Total number of units: 132

Bachelor of Science in Cybersecurity

Objectives of the Program

The Bachelor of Science in Cybersecurity is a 4-year undergraduate curriculum that ensures academic success and preparation for a productive career in cybersecurity. The program aims to equip students with the skills and knowledge necessary to secure computer systems, networks, and data from various cyber threats.

The objectives of the program are:

1. To provide students with a solid foundation in computer science principles and practices, as well as specialized knowledge in the field of cybersecurity.
2. To equip students with the knowledge and skills necessary to identify, assess, and mitigate cybersecurity risks and threats.
3. To train students in the design, implementation, and management of secure computer systems and networks.
4. To educate students on legal, ethical, social, and economic issues related to cybersecurity, including privacy, data protection, and cybercrime.
5. To provide students with the intellectual skills necessary for continuous learning in order to keep up with the constantly evolving industry.
6. To prepare students for a successful career in the field of cybersecurity and for advanced study in computer science and cybersecurity at the graduate level.

Why should a student take this program?

This Bachelor of Science in Cybersecurity typically covers topics such as computer programming, algorithms, database systems, operating systems, computer networks, network security, risk management, cybercrimes, cryptography, and cybersecurity technologies and techniques. Students will also learn about legal, ethical, and social issues related to cybersecurity.

There are several compelling reasons why a student should consider taking this program:

1. High Demand for Cybersecurity Professionals: There is a growing demand for cybersecurity professionals in virtually every industry. As more organizations adopt digital technologies, the need for cybersecurity experts to secure their networks and data becomes increasingly critical.
2. Career Opportunities: The program prepares graduates for a wide range of careers in the cybersecurity industry, including roles such as cybersecurity analyst, network security specialist, digital forensics investigator, information security manager, and cybersecurity consultant.
3. High Earning Potential: Cybersecurity professionals typically earn high salaries due to the high demand for their skills and expertise.
4. Challenging and Dynamic Field: Cybersecurity is a constantly evolving field, with new threats and technologies emerging all the time. Students who enjoy problem-solving and working in a dynamic environment will find this program engaging and rewarding.
5. Contribution to Society: Cybersecurity professionals play an essential role in protecting organizations and individuals from cyber threats. By taking this program, students have the

opportunity to make a significant contribution to society by helping to keep people and their data safe.

Program Learning Outcomes

The Program Learning Outcomes (PLOs) are:

1. Demonstrate critical knowledge and understanding of mathematics and current technical concepts and practices in the core of computing and cybersecurity.
2. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
3. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
4. Communicate effectively in a variety of professional contexts.
5. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
6. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
7. Apply security principles and practices to maintain operations in the presence of risks and threats. [CY]

General Description of Graduate Profile

Graduates of the Bachelor of Science in Cybersecurity acquire a strong foundation in computer science principles and practices, including a comprehensive understanding of mathematical, science, electronics, and computing. In addition to their computer science knowledge, graduates gain specialized skills in cybersecurity technologies and techniques, risk management, threat analysis, and incident response. They also develop critical skills such as effective communication, collaboration, adaptability, ethical decision-making, sustainability, and the ability to analyze, design, and solve complex IT problems.

Upon completion of the program, graduates should be able to design and implement secure computer systems, evaluate and mitigate cybersecurity risks, perform forensic investigations, and apply ethical principles to cybersecurity practices. Graduates of the program can pursue careers in various fields such as cybersecurity analyst, network security specialist, digital forensics investigator, information security manager, and cybersecurity consultant.

Course List

All students pursuing the Bachelor of Science in Cybersecurity must complete a minimum of 130 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of (39) credits of General Education Requirements
- A minimum of (6) credits of Professional Elective Options
- A minimum of (40) credits of Computing Requirements
- A minimum of (36) credits of Major Requirements
- A minimum of (9) credits of Major Electives
- Graduate Portfolio

General Education Requirements (39 credits)

National Requirements*		**(7 Credits)**
ARHG 101/104	Arabic for Non-Arabic/Arabic Speakers*	(3 Credits)
ARHG 106	Modern History of Bahrain *	(2 Credits)
ARHG 107	Human Rights*	(2 Credits)

English Requirements		**(6 Credits)**
ENGL 101	Composition I	(3 Credits)
ENGL 102	Composition II	(3 Credits)

Mathematics Requirements		**(8 Credits)**
MATH 153	Calculus I	(4 Credits)
MATH 154	Calculus II	(4 Credits)

ICT Requirements		**(3 Credits)**
COSC 101	Introduction to Computing	3 Credits

Lifelong Learning Requirements		**(1 Credit)**
UNSS 101	University Skills	(1 Credit)

Natural Science Requirements (8 Credits)

Students should complete a minimum of 8 credits, including at least 2 credit labs from the Natural Science list of the General Education below or any other science courses approved by the College of Arts and Science and the College of Engineering and Computing.

CHEM 101	Introductory Chemistry	(3 credits)
CHEM 101L	Introductory Chemistry Laboratory	(1 credit)
PHYS 101	Principles of Physics I	(3 credits)
PHYS 101L	Principles of Physics I Laboratory	(1 credit)
PHYS 102	Principles of Physics II	(3 credits)
PHYS 102L	Principles of Physics II Laboratory	(1 credit)
BIOL 101	Principles of Biology I	(3 credits)
BIOL 101L	Principles of biology Laboratory	(1 credit)
ASTR 352	Current Development in Astronomy	(3 credit)
ASTR 352L	Current Development in Astronomy Laboratory	(1 credit)

Arts and Humanities Requirements (3 Credits)

Students should complete a minimum of 3 credits from the list below or any other arts and humanities course approved by the College of Arts and Sciences.

- TURK 101 Turkish for Beginners (3 credits)
- CCHN 101 Spoken Mandarin (3 credits)
- PHIL 101 Introduction to Philosophy (3 credits)
- ANTH 152 Introduction to Cultural Anthropology (3 credits)

- HUMS 101 Forms and Ideas in the Humanities (3 credits)
- HIST 201 World History (3 credits)
- COMS 151 Public Speaking (3 credits)
- COMS 356 Intercultural Communication (3 credits)

Social and Behavioral Science Requirements (3 Credits)

Students should complete a minimum of 3 credits from the list below or any other social and behavioral science course approved by the College of Arts and Sciences.

PSYC 101	Introduction to Psychology	(3 credits)
SOCS 101	Introduction to Sociology	(3 credits)
ENGL 205	Business Communication	(3 credits)
SUST 101	Principles of Sustainability	(3 credits)
POLS 321	Comparative Political Ideologies	(3 credits)

COMPUTING REQUIREMENTS (40 credits)

The following courses constitute the Computing Requirements for the Bachelor of Science in Cybersecurity:

COSC 102	Object-Oriented Programming	(3 credits)
COSC 125	Data Structure and Programming Techniques	(3 credits)
MATH 203	Discrete Mathematics	(3 credits)
CMPE 215	Communication Networks	(3 credits)
ENGR 205	Multidisciplinary Research Methods	(2 credits)
MATH 255	Introduction to Linear Algebra	(3 credits)
MATH 260	Probability and Statistics	(4 credits)
CMPE 270	Digital Systems	(3 credits)
CMPE 270L	Digital Systems Laboratory	(1 credit)
CMPE 271	Computer Organization	(3 credits)
COSC 312	Design and Usage of Databases	(3 credits)
COSC 372	Operating Systems	(3 credits)
COSC 372L	Operating Systems Laboratory	(1 credit)
SWEN 360	Software Design and Engineering	(3 credits)
ENGR 401	Entrepreneurship for Engineers	(2 credits)

MAJOR REQUIREMENTS (36 credits)

The following courses constitute the Major Requirements for the Bachelor of Science in Cybersecurity:

COSC 248 Algorithms and Complexity (3 credits)
CYBR 310 Introduction to Cybersecurity (3 credits)
SWEN 360L Software Design and Engineering Laboratory (1 credit)
CYBR 362 Security Vulnerabilities and Threats (3 credits)
CYBR 460 Secure Software Design and Engineering (3 credits)
CYBR 315 Network Security and Forensics Analysis (3 credits)
CYBR 375 Cybercrime (3 credits)
CYBR 462 Information System Risk Management (3 credits)

CYBR 470 Cryptography (3 credits)
CYBR 480 Security Standards and Audits (3 credits)
CYBR 410L Cybersecurity Professional Certificate (1 credit)
CYBR 405 Cybersecurity Internship (3 credits)
CYBR 495A Cybersecurity Design Project A (1 credit)
CYBR 495B Cybersecurity Design Project B (3 credits)

MAJOR ELECTIVES (9 credits)
Students pursuing the Bachelor of Science in Cybersecurity must complete a minimum of 9 elective credits from the following list or any other course approved by the College of Engineering and Computing:

CYBR 415	Cloud Security and Privacy	(3 credits)
CYBR 465	Web application Security	(3 credits)
CYBR 467	Ethical Hacking	(3 credits)
CYBR 482	Information Technology Audit and Control	(3 credits)
CYBR 487	Cybersecurity Framework and Management	(3 credits)
CYBR 475	Cyber Incident Handling and Response	(3 credits)

PROFESSIONAL ELECTIVE OPTIONS (6 credits)
Students pursuing the Bachelor of Science in Cybersecurity must complete a minimum of 6 elective credits from general education course or any other programs at 200 level or above.

INTERNSHIP (3 credits)
To qualify for the Bachelor of Science in Cybersecurity a student must fulfill the internship requirements prior to graduation. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical setting. The internship consists of a minimum of 280 work hours (8 weeks) with an approved employer. Internships are evaluated by the internship coordinator with a pass/fail grade.

Graduate Portfolio
Students are also required to compile a portfolio of evidence showing their development throughout their educational journey. The portfolio is expected to include a sample of activities that the student considers significant to his/her learning. The graduation portfolio aims to:

- Provide an insight into the student's personality and areas of interest.
- Showcase the student's work and development over time.
- Encourage students to engage in their wider academic and social context.
- Encourage students to reflect on their own learning and development.
- Promote AUBH graduates to employers.

Total number of units: 130

Bachelor of Science in Data Science and Artificial Intelligence *Pending WSCUC Approval

Objectives of the Program

The Bachelor of Science in Data Science and Artificial Intelligence consists of a 4-year undergraduate curriculum that aims to produce practicing data scientists with the highest level of skills in the industry. More specifically, the objectives of the program are:

1. To provide students with a solid foundation in mathematics, statistics, and computer science principles, as well as specialized knowledge in the field of data science and artificial intelligence.
2. To equip students with the skills and techniques necessary to collect, clean, and analyze large datasets using various data science tools and programming languages.
3. To train students in the application of machine learning algorithms and artificial intelligence techniques to develop predictive models, natural language processing systems, computer vision applications, and other AI-driven solutions.
4. To educate students on the ethical and responsible use of data science and artificial intelligence, including considerations of privacy, bias, and fairness.
5. To foster critical thinking and problem-solving skills in students, enabling them to identify opportunities for applying data science and AI in various domains and industries.
6. To prepare students for a successful career in the field of data science and artificial intelligence, as well as for advanced study in related disciplines at the graduate level.

Why should a student take this program?

The Bachelor of Science in Data Science and Artificial Intelligence covers a wide range of topics, including computer programming, algorithms, database systems, statistics, machine learning, deep learning, data visualization, big data analytics, and AI ethics. Students will gain hands-on experience with industry-standard tools and technologies used in data science and AI applications.

There are several compelling reasons why a student should consider taking this program:

1. Growing Demand for Data Scientists and AI Professionals: The field of data science and artificial intelligence is experiencing rapid growth, and there is a high demand for skilled professionals who can extract insights from data and develop AI-driven solutions.
2. Diverse Career Opportunities: Graduates of this program can pursue diverse career paths in industries such as finance, healthcare, e-commerce, marketing, and technology, with job roles including data scientist, machine learning engineer, AI specialist, data analyst, and research scientist.
3. Exciting and Innovative Field: Data science and artificial intelligence are at the forefront of technological advancements and innovation. Students who are passionate about cutting-edge technologies and want to be part of groundbreaking developments will find this program intellectually stimulating.
4. Competitive Salaries: Data scientists and AI professionals are highly sought after, and they command competitive salaries due to the specialized skills and expertise they possess.
5. Impactful Contributions: Data science and AI have the potential to revolutionize various industries and address complex societal challenges. By pursuing this program, students can make meaningful contributions by leveraging data-driven insights and AI solutions to drive positive change

Program Learning Outcomes

The Program Learning Outcomes (PLOs) are:

1. Demonstrate critical knowledge and understanding of mathematics and current technical concepts and practices in the core of computing, Data Science, and Artificial Intelligence.
2. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
3. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
4. Communicate effectively in a variety of professional contexts.
5. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
6. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
7. Apply theory, techniques, and tools throughout the data science lifecycle and employ the resulting knowledge to satisfy stakeholders' needs.

General Description of Graduate Profile

Graduates of the Bachelor of Science in Data Science and Artificial Intelligence possess a strong foundation in mathematics, statistics, data science and computer science. They have a comprehensive understanding of data science principles, machine learning algorithms, and artificial intelligence techniques. Additionally, graduates develop critical skills such as data analysis, programming, problem-solving, communication, and ethical decision-making.

Upon completion of the program, graduates should be able to apply data science methodologies to extract insights from large datasets, develop and deploy machine learning models, apply AI algorithms to solve real-world problems, and evaluate the ethical implications of data-driven solutions. Graduates of the program can pursue careers in diverse fields such as data science, machine learning, AI research, data analytics, and AI consulting.

Program Structure

All students pursuing the Bachelor of Science in Data Science and Artificial Intelligence must complete a minimum of 130 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of (39) credits of General Education Requirements
- A minimum of (40) credits of Computing Requirements
- A minimum of (36) credits of Major Requirements
- A minimum of (9) credits of Major Electives
- A minimum of (6) credits of Professional Elective Options
- Graduate Portfolio

GENERAL EDUCATION REQUIREMENTS (39 credits)

National Requirements (7 credits)

ARHG 101 or ARHG 104 Arabic for non-Arabic speakers OR
Arabic for Arabic speakers (3 credits)

ARHG 106 Modern History of Bahrain	(2 credits)
ARHG 107 Human Rights	(2 credits)

English Requirements (6 credits)

ENGL 101 Composition I	(3 credits)
ENGL 102 Composition II	(3 credits)

Mathematics Requirements (8 credits)

MATH 153 Calculus I	(4 credits)
MATH 154 Calculus II	(4 credits)

Natural Science Requirements (8 credits)

Students should complete a minimum of 8 credits, including at least 2 credit labs from the Natural Science list of the General Education below or any other science courses approved by the College of Arts and Science and the College of Engineering and Computing:

CHEM 101 Introductory Chemistry	(3 credits)
CHEM 101L Introductory Chemistry Laboratory	(1 credit)
PHYS 101 Principles of Physics I	(3 credits)
PHYS 101L Principles of Physics I Laboratory	(1 credit)
BIOL 101 Principles of Biology I	(3 credits)
BIOL 101L Principles of Biology I Laboratory	(1 credit)
PHYS 102 Principles of Physics II	(3 credits)
PHYS 102L Principles of Physics II Laboratory	(1 credit)
ASTR 352 Current Development in Astronomy	(3 credits)
ASTR 352L Current Development in Astronomy Laboratory	(1 credits)

Social and Behavioral Science Requirements (3 credits)

Students should complete a minimum of 3 credits from the list below or any other social and behavioral science course approved by the College of Arts and Sciences:

PSYC 101 Introduction to Psychology	(3 credits)
SOCS 101 Introduction to Sociology	(3 credits)
ENGL 205 Business Communication	(3 credits)
SUST 101 Principles of Sustainability	(3 credits)
POLS 321 Comparative Political Ideologies	(3 credits)

Arts and Humanities Requirements (3 credits)

Students should complete a minimum of 3 credits from the list below or any other arts and humanities course approved by the College of Arts and Sciences:

TURK 101 Turkish for Beginners	(3 credits)
CCHN 101 Spoken Mandarin	(3 credits)
PHIL 101 Introduction to Philosophy	(3 credits)
ANTH 152 Introduction to Cultural Anthropology	(3 credits)
HUMS 101 Forms and Ideas in the Humanities	(3 credits)
HIST 201 World History	(3 credits)

ENGL 103 Public Speaking	(3 credits)
COMS 356 Intercultural Communication	(3 credits)
CULT 101 Cultural Criticism	(2 credits)

ICT (3 credits)

COSC 101 Introduction to Computing	(3 credits)

Lifelong Learning (1 credit)

UNSS 101 University Success	(1 credit)

COMPUTING REQUIREMENTS (40 credits)

The following courses constitute the Computing Requirements for the Bachelor of Science in Data Science and Artificial Intelligence:

COSC 102 Object-Oriented Programming	(3 credits)
COSC 125 Data Structure and Programming Techniques	(3 credits)
MATH 203 Discrete Mathematics	(3 credits)
CMPE 215 Communication Networks	(3 credits)
ENGR 205 Multidisciplinary Research Methods	(2 credits)
MATH 255 Introduction to Linear Algebra	(3 credits)
MATH 260 Probability and Statistics	(4 credits)
CMPE 270 Digital Systems	(3 credits)
CMPE 270L Digital Systems Laboratory	(1 credit)
CMPE 271 Computer Organization	(3 credits)
COSC 312 Design and Usage of Databases	(3 credits)
COSC 372 Operating Systems	(3 credits)
COSC 372L Operating Systems Laboratory	(1 credit)
SWEN 360 Software Design and Engineering	(3 credits)
ENGR 401 Entrepreneurship for Engineers	(2 credits)

MAJOR REQUIREMENTS (36 credits)

The following courses constitute the Major Requirements for the Bachelor of Science in Data Science and Artificial Intelligence:

COSC 248 Algorithms and Complexity	(3 credits)
DSAI 310 Introduction to Data Science	(3 credits)
DSAI 370 Data Analytics Ethics	(3 credits)
DSAI 380 Data Visualization	(3 credits)
SWEN 360L Software Design and Engineering Laboratory	(1 credit)
CYBR 310 Introduction to Cybersecurity	(3 credits)
DSAI 465 Artificial Intelligence	(3 credits)
DSAI 474 Computer Vision	(3 credits)
DSAI 462 Advanced Computational Statistics	(3 credits)
DSAI 482 Big Data Technologies	(3 credits)
DSAI 410L Data Science Professional Certificate	(1 credit)
DSAI 406 Data Science Internship	(3 credits)
DSAI 499A Data Science Design Project A	(1 credit)
DSAI 499B Data Science Design Project B	(3 credits)

MAJOR ELECTIVES (9 credits)

Students pursuing the Bachelor of Science in Data Science and Artificial Intelligence must complete a minimum of 9 elective credits from the following list or any other course approved by the College of Engineering and Computing:

DSAI 422 Data Mining	(3 credits)
DSAI 460 Internet of Things Analytics	(3 credits)
DSAI 448 Sports Analytics	(3 credits)
DSAI 420 Marketing Analytics	(3 credits)
DSAI 472 Social and Behavioral Analytics	(3 credits)
DSAI 450 Business Intelligence	(3 credits)

PROFESSIONAL ELECTIVE OPTIONS (6 credits)

Students pursuing the Bachelor of Science in Data Science and Artificial Intelligence must complete a minimum of 6 elective credits from general education course or any other programs at 200 level or above.

INTERNSHIP (3 credits)

To qualify for the Bachelor of Science in Data Science and Artificial Intelligence a student must fulfill the internship requirements prior to graduation. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical setting. The internship consists of a minimum of 280 work hours (8 weeks) with an approved employer. Internships are evaluated by the internship coordinator with a pass/fail grade.

GRADUATE PORTFOLIO

The American University of Bahrain recognizes the importance of curricular and non-curricular activities in developing graduate attributes. Hence, students are required to compile a portfolio of evidence showing their development throughout their educational journey. The portfolio is expected to include just a sample of activities that the student considers significant to his/her learning. The graduation portfolio aims to:

- Provide an insight into the student's personality and areas of interest.
- Showcase the student's work and development over time.
- Encourage students to engage in their wider academic and social context.
- Encourage students to reflect on their own learning and development.
- Promote AUBH graduates to employers.

Total number of units: 130

Bachelor of Science in Software Engineering *Pending WSCUC Approval

Objectives of the Program

The Bachelor of Science in Software Engineering is a 4-year undergraduate curriculum designed to provide students with a comprehensive understanding of software development principles, methodologies, and practices. The program aims to equip students with the skills and knowledge necessary to design, develop, test, and maintain software systems that meet the needs of various industries and organizations. More specifically, the objectives of the program are:

1. To provide students with a strong foundation in computer science principles, programming languages, and software engineering fundamentals.
2. To equip students with the skills and techniques necessary to analyze user requirements, design software solutions, and implement them using appropriate software development methodologies.
3. To train students in the use of modern software engineering tools and technologies, including software development environments, version control systems, and automated testing frameworks.
4. To educate students on software quality assurance practices, including software testing, debugging, and maintenance, to ensure the reliability and efficiency of software systems.
5. To foster teamwork, communication, and project management skills in students, enabling them to work effectively in software development teams and deliver projects on time and within budget.
6. To prepare students for a successful career in software engineering and for advanced study in related disciplines at the graduate level.

Why should a student take this program?

The Bachelor of Science in Software Engineering covers a wide range of topics, including programming languages, software design, algorithms, databases, software testing, project management, and software quality assurance. Students will gain practical experience in developing software solutions and working on real-world projects.

There are several compelling reasons why a student should consider taking this program:

1. High Demand for Software Engineers: There is a growing demand for skilled software engineers across various industries, as software has become an integral part of modern businesses and organizations.
2. Abundance of Career Opportunities: Graduates of this program can pursue diverse career paths in industries such as technology, finance, healthcare, e-commerce, and entertainment. Job roles include software developer, software engineer, systems analyst, software architect, and project manager.
3. Competitive Salaries: Software engineers command competitive salaries due to their specialized skills and expertise in designing and developing software systems.
4. Continuous Learning and Innovation: The field of software engineering is constantly evolving, with new technologies, frameworks, and methodologies emerging regularly. Students who enjoy continuous learning and want to be at the forefront of technological advancements will find this program intellectually stimulating.
5. Creativity and Problem-Solving: Software engineering involves solving complex problems and designing innovative solutions. Students who enjoy creative thinking and finding efficient ways to address challenges will thrive in this program.

The Program Learning Outcomes (PLOs) are:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

General Description of Graduate Profile

Graduates of the Bachelor of Science in Software Engineering possess a strong foundation in computer science principles, programming languages, and software development methodologies. They have a comprehensive understanding of software design, development, testing, and maintenance processes. Additionally, graduates develop critical skills such as problem-solving, teamwork, communication, and project management.

Upon completion of the program, graduates should be able to analyze user requirements, design and develop software solutions, apply software engineering best practices, conduct software testing and debugging, and collaborate effectively in software development teams. Graduates of the program can pursue careers in various fields such as software development, software engineering, systems analysis, software architecture, and project management.

Program Structure

All students pursuing the Bachelor of Science in Software Engineering must complete a minimum of 130 credits with a cumulative GPA of 2.0 or better. Specifically, the requirements are as follows:

- A minimum of (39) credits of General Education Requirements
- A minimum of (40) credits of Computing Requirements
- A minimum of (36) credits of Major Requirements
- A minimum of (9) credits of Major Electives
- A minimum of (6) credits of Professional Elective Options
- Graduate Portfolio

GENERAL EDUCATION REQUIREMENTS (39 credits)

National Requirements (7 credits)

ARHG 101 or ARHG 104 Arabic for non-Arabic speakers OR
Arabic for Arabic speakers (3 credits)
ARHG 106 Modern History of Bahrain (2 credits)
ARHG 107 Human Rights (2 credits)

English Requirements (6 credits)
ENGL 101 Composition I (3 credits)
ENGL 102 Composition II (3 credits)

Mathematics Requirements (8 credits)
MATH 153 Calculus I (4 credits)
MATH 154 Calculus II (4 credits)

Natural Science Requirements (8 credits)
Students should complete a minimum of 8 credits, including at least 2 credit labs from the Natural Science list of the General Education below or any other science courses approved by the College of Arts and Science and the College of Engineering and Computing:

CHEM 101 Introductory Chemistry (3 credits)
CHEM 101L Introductory Chemistry Laboratory (1 credit)
PHYS 101 Principles of Physics I (3 credits)
PHYS 101L Principles of Physics I Laboratory (1 credit)

Social and Behavioral Science Requirements (3 credits)
Students should complete a minimum of 3 credits from the list below or any other social and behavioral science course approved by the College of Arts and Sciences:

PSYC 101 Introduction to Psychology (3 credits)
SOCS 101 Introduction to Sociology (3 credits)
ENGL 205 Business Communication (3 credits)
SUST 101 Principles of Sustainability (3 credits)
POLS 321 Comparative Political Ideologies (3 credits)

Arts and Humanities Requirements (3 credits)
Students should complete a minimum of 3 credits from the list below or any other arts and humanities course approved by the College of Arts and Sciences:

TURK 101 Turkish for Beginners (3 credits)
CCHN 101 Spoken Mandarin (3 credits)
PHIL 101 Introduction to Philosophy (3 credits)
ANTH 152 Introduction to Cultural Anthropology (3 credits)
HUMS 101 Forms and Ideas in the Humanities (3 credits)
HIST 201 World History (3 credits)
ENGL 103 Public Speaking (3 credits)
COMS 356 Intercultural Communication (3 credits)

CULT 101 Cultural Criticism	(3 credits)

ICT Requirements	**(3 credits)**
COSC 101 Introduction to Computing	(3 credits)

Lifelong Learning Requirements	**(1 credit)**
UNSS 101 University Success	(1 credit)

COMPUTING REQUIREMENTS (40 credits)

The following courses constitute the Computing Requirements for the Bachelor of Science in Software Engineering:

COSC 102 Object-Oriented Programming	(3 credits)
COSC 125 Data Structure and Programming Techniques	(3 credits)
MATH 203 Discrete Mathematics	(3 credits)
CMPE 215 Communication Networks	(3 credits)
ENGR 205 Multidisciplinary Research Methods	(2 credits)
MATH 255 Introduction to Linear Algebra	(3 credits)
MATH 260 Probability and Statistics	(4 credits)
CMPE 270 Digital Systems	(3 credits)
CMPE 270L Digital Systems Laboratory	(1 credit)
CMPE 271 Computer Organization	(3 credits)
COSC 312 Design and Usage of Databases	(3 credits)
COSC 372 Operating Systems	(3 credits)
COSC 372L Operating Systems Laboratory	(1 credit)
SWEN 360 Software Design and Engineering	(3 credits)
ENGR 401 Entrepreneurship for Engineers	(2 credits)

MAJOR REQUIREMENTS (36 credits)

The following courses constitute the Major Requirements for the Bachelor of Science in Software Engineering:

PHYS 102 Principles of Physics II	(3 credits)
PHYS 102L Principles of Physics II Laboratory	(1 credit)
DSAI 310 Introduction to Data Science	(3 credits)
CYBR 310 Introduction to Cybersecurity	(3 credits)
SWEN 360L Software Design and Engineering Laboratory	(1 credits)
CYBR 460 Secure Software Design and Engineering	(3 credits)
SWEN 320 Human Computer Interaction	(2 credits)
SWEN 370 Software Requirements Engineering	(3 credits)
SWEN 470 Software Design and Architecture	(3 credits)
SWEN 460 Software Testing and Quality Assurance	(3 credits)
COSC 485 Web Engineering	(3 credits)
SWEN 410L Software Engineering Professional Certificate	(1 credit)
SWEN 499A Software Engineering Design Project A	(1 credit)
SWEN 499B Software Engineering Design Project B	(3 credits)
SWEN 406 Software Engineering Internship	(3 credits)

MAJOR ELECTIVES (9 credits)

Students pursuing the Bachelor of Science in Software Engineering must complete a minimum of 9 elective credits from the following list or any other course approved by the College of Engineering and Computing:

SWEN 475 Object Oriented Design	(3 credits)
COSC 415 Cloud Computing	(3 credits)
COSC 412 Implementation of Database Systems	(3 credits)
COSC 486 Mobile Programming	(3 credits)
CYBR 415 Cloud Security and Privacy	(3 credits)
CYBR 465 Web application Security	(3 credits)

PROFESSIONAL ELECTIVE OPTIONS (6 credits)

Students pursuing the Bachelor of Science in Software Engineering must complete a minimum of 6 elective credits from general education course or any other programs at 200 level or above.

INTERNSHIP (3 credits)

To qualify for the Bachelor of Science in Software Engineering a student must fulfill the internship requirements prior to graduation. The purpose of the internship is to expose students to the profession and give them an opportunity to apply their academic knowledge in a practical setting. The internship consists of a minimum of 280 work hours (8 weeks) with an approved employer. Internships are evaluated by the internship coordinator with a pass/fail grade.

GRADUATE PORTFOLIO

The American University of Bahrain recognizes the importance of curricular and non-curricular activities in developing graduate attributes. Hence, students are required to compile a portfolio of evidence showing their development throughout their educational journey. The portfolio is expected to include just a sample of activities that the student considers significant to his/her learning. The graduation portfolio aims to:

1. Provide an insight into the student's personality and areas of interest.
2. Showcase the student's work and development over time.
3. Encourage students to engage in their wider academic and social context.
4. Encourage students to reflect on their own learning and development.
5. Promote AUBH graduates to employers.

Total number of units: 130

Master of Science in Engineering Management

The Master of Science in Engineering Management at the American University of Bahrain is a graduate degree program designed to expose students to the theories and practices of the modern engineering management environment. The program is designed to prepare students for positions of leadership as well as to provide students with a broad comprehensive view of advanced studies in Engineering Management.

The program aims to improve the decision-making capabilities of students by providing them with functional business fundamentals and managerial capabilities, whilst enhancing their analytical, communicational and technological skills. The program will enable students to contribute intellectually to the engineering management profession.

Why should a student take this program?

This program provides an in-depth understanding of the importance of linking technology to corporate strategy, and of the tools and techniques that will enable middle and senior managers to develop, implement and manage technology strategy and innovation at business and corporate levels. This program aims to provide students with the fundamentals to meet the new competitive challenges of the knowledge-driven global economy. With advanced technology and rapid growth in the engineering industry, students with specific qualifications and credentials will have a wide range of great career opportunities.

Graduates who choose to pursue a career in Engineering Management will be prepared to plan, organize, lead, control and evaluate quality improvement initiatives in various types of organizations, both public and private. The program is designed to expand students' careers opportunities and strengthen their credentials as managers, administrators, and consultants.

Program Learning Outcomes

On successful completion of the program a graduate will be able to:

1. Develop an understanding of engineering management theories, methods, practices, and strategies.
2. Gain an in-depth understanding of management practices, organizational behavior, and business improvement methods
3. Manage resources, apply analytical thought to effectively managing people, finance, and enterprises as an integrated system.
4. Manage across boundaries and evaluate how products can best be designed, configured, and produced.
5. Understand and appreciate the role of engineering on people, the environment, and the generation of wealth.
6. Develop leadership skills, competencies, and knowledge to succeed as a professional engineering manager.

Program Structure

All students pursuing the Master of Science in Engineering Management must complete a minimum of 33 credits with a cumulative GPA of 2.0 or higher. Specifically, the requirements are as follows:

- A minimum of 21 credits of Major Requirements
- A minimum of 6 credits of Major Electives
- A minimum of 6 credits of Master Theses

Foundation Courses:

1. ENGM 411: Foundation in Research Methods	(0 credit)

Required Course(s)

ENGM 511: Financial and Cost Accounting	(3 credits)
ENGM 512: Project Management	(3 credits)
ENGM 513: Managing People and Organizations	(3 credits)
ENGM 514: Technology Management	(3 credits)
ENGM 525: Concept to Commercialization	(3 credits)
MGMT 520 Operations Management in Global Supply Chains	(3 credits)
ENGM 535: Analytics for Engineering Managers	(3 credits)
ENGM 599: Master Thesis	(6 credits)

Elective Course(s) (select two courses from the list below or any other graduate course(s) approved by the department)

ENGM 528: Engineering and Sustainable Development	(3 credits)
ENGM 529: Environmental, Social and Governance (ESG)	(3 credits)
ENGM 532: Product Design and Innovation	(3 credits)
ENGM 536: Financial Management	(3 credits)
MGMT 513: Leadership Development and Team Building	(3 credits)
MGMT 530: People Analytics for Leaders	(3 credits)
BUSN 520 Business Data Mining and Predictive Analytics	(3 credits)

COURSE DESCRIPTIONS

ACCT 201 Introduction to Financial Accounting (3 credits)
This course is an introduction to accounting and is required of all business majors. Its primary purpose is to give you an understanding of how and why accounting information is used from an external (financial reporting) and to some extent, internal (managerial reporting) perspective. Although the process of preparing accounting reports will be discussed, it is not the primary focus of this course. Instead, the focus will be on how accounting reports can facilitate decision making for a wide variety of individuals who are interested in and affected by the activities of a business. *Prerequisites: None*

ACCT 202 Introduction to Managerial Accounting (3 credits)
This introductory accounting course provides students with the knowledge of managerial accounting and its application in making economic decisions in a business entity. Topics covered will enable students to analyze and interpret both historical and estimated data by management to conduct daily operations, plan future operations and develop overall business strategies. As such, the emphasis will be on the use of accounting information for management purposes. Further developing analytical skills through problem solving and thoughtful participation in class as part of the preparation for a professional career is a major objective of this course. *Prerequisite: ACCT 201*

ACCT 311 Intermediate Accounting (3 credits)
This course provides a deeper understanding of accounting theory and its practical application. It covers the conceptual framework of financial reporting, presentation and disclosure of the financial statements and the application of selected accounting standards. ***(****Prerequisite: ACCT 201****)***

ANTH 152 Introduction to Cultural Anthropology (3 credits)
Study of the variety of cultural patterns that human societies use to adapt to the environment, guide social interaction and understand the human condition. Introduces the ideas and methods anthropologists use to develop a scientific and humanistic understanding of the world's cultures. *Prerequisites: None*

ARHG 101 Arabic for non-Arabic speakers (3 credits)
This course develops reading and writing skills in Modern Standard Arabic with active speaking and listening skills in both formal Arabic and various Arabic dialects. Authentic materials from the Arabic media will be used in addition to text-related video and audio materials. *Prerequisites: None*

ARHG 104 Arabic for Arabic Speakers (3 credits)
A practical language course which aims at developing the language skills of native speakers of Arabic. This course provides the students with a comprehensive knowledge of the linguistic system. It is intended to help learners reach a superior level of proficiency by expanding vocabulary and providing paragraph-level activities in reading, writing, and speaking; through a selection texts by writers from across the Arab world address literary themes and represent a range of genres, styles, and periods, where each text is followed by exercises that measure understanding and comprehension, vocabulary and language applications, including grammar, morphology, spelling, stylistic applications and composition. *Prerequisites: None*

ARHG 106 Modern History of Bahrain (2 credits)

The course covers the Modern History of Bahrain since 1500 till 2002. It contains: Chapter I: Introduction geography. Chapter II: A Short History of Bahrain until the beginning of the sixteenth century. Chapter III: Bahrain between European and regional ambitions. Chapter IV: Utub tribe and the establishment of political entities in the Arabian Gulf. Chapter V of Bahrain and British protection. Chapter VI: Bahrain after independence. *Prerequisites: None*

ARHG 107 Human Rights (2 credits)
This course covers human rights historical development, major human rights laws, treaties, and conventions. To learn obligations as citizens and residents of Bahrain as well as a member of the international community and to understand Human Rights Enforcement Mechanisms in Bahrain. *Prerequisites: None*

ASTR 352 Current Developments in Astronomy (3 credits)
In-depth examination and interpretation of astronomical discoveries occurring at the time the course is taught. Reading includes both background material and current periodicals accessible to General Education students. Likely areas of discussion include spacecraft exploration of the solar system, satellite observations of high-energy radiation from space, exotic astronomical objects (e.g., double quasars, black hole candidates), and new cosmological data. *Co-requisite: ENGL 102*

ASTR 352L Current Developments in Astronomy Lab (1 credit)
ASTR 352L is designed to reinforce topics presented in ASTR 352 lectures. Through scientific experimentation, students will improve their understanding of basic concepts in astronomy while becoming trained on experimental techniques used in astronomy and increasing their insight on the foundations of the scientific process. Likely topics covered are the exploration of the sky, angular size, the spectrum, the Doppler effect, eclipses, moon phases, transits, day and night, the seasons, our Sun, the search of exoplanets, the state of the universe, and the age of the universe. *Pre-co-requisites: ASTR 352*

BIOL 101 Principles of Biology I (3 credits)
This course provides students with an introduction to the fundamental principles of biology. Topics covered include: cells and macromolecules; genetics and inheritance; evolution and biodiversity; and ecology. Through this course, students will have the opportunity to increase their understanding of biology as it applies to society and everyday life. *Prerequisites: None*

BIOL 101L Principles of Biology I Laboratory (1 credit)
This course is designed to reinforce topics presented in BIOL 101 lectures. Through hands-on, scientific experimentation, students will improve their understanding of basic concepts in biology: cells, genetics and inheritance, evolution and biodiversity, and ecology. Students will also participate in a field visit to a local mangrove forest. *Pre-requisite/Co-requisite: BIOL 101*

BUSN 101 Introduction to Business (3 credits)
This course introduces the fundamental principles of business organization, ownership, operation, and control. It demonstrates an understanding of the business language and theory of today's organizations in terms of surviving in the economic systems. This course will help students to demonstrate the ability to express business ideas and plans in writing, ability to make effective oral business presentations, ability to work in teams, and develop effective communication skills to thrive in today's market dynamics. *Prerequisites: None*

BUSN 301 Business Law (3 credits)
This course is designed to provide learners with a study of the law governing the business environment, including the study of common law, statutory law and the role of legal institutions in regulating business activities. The course covers the topics of the American legal system, including civil litigation, intentional and unintentional torts, and the law of contracts. The course includes a general discussion of the legal system of Bahrain, in line with the course content. *Prerequisites: Minimum 60 credits*

BUSN 401: Business Research Methods (3 credits)
This course is designed to provide students with the necessary skills and knowledge to determine the information necessary to address an identified research problem (basic or applied) and, using this understanding, develop and use an actionable research proposal. In this process, the students will gain an understanding of relevant approaches and elements of undertaking a research enquiry specifically to provide insights to solving a relevant problem. They will develop critical core competencies and skills required to carry out such an enquiry. These competencies and skills include: defining research questions; setting appropriate research objectives; study design that incorporates research objectives; secondary and primary data collection and instruments; sampling and analysis methods; and effective reporting of results; as well as the importance of ethical conduct in conducting research in both a domestic and in international business contexts. *Pre-requisites: MATH 115, Min 70 credits*

BUSN 410 Artificial Intelligence for Business (3 credits)
This course aims to provide students with critical knowledge and experience to identify opportunities in proposing and deploying AI solutions to real business scenarios. Having successfully completed the course, students will be able to describe AI and the role it can play to deliver benefits for businesses, identify potential applications of AI in practice, and assess the main capabilities of AI and the core technologies that help deliver them. *Prerequisites: MATH 115, MSYS 201, ENGL 205, minimum 90 credits*

BUSN 411 Foundation in Research Methods (0 credits)
This course is designed to provide students with the necessary skills and knowledge to determine the information necessary to address an identified research problem (basic or applied). In this process, the students will gain an understanding of relevant approaches and elements of undertaking a research enquiry specifically to provide insights to solving a relevant problem. They will develop critical core competencies and skills required to carry out such an enquiry. These competencies and skills include: defining research questions; setting appropriate research objectives; study design that incorporates research objectives; secondary and primary data collection and instruments; sampling and analysis methods; and effective reporting of results; as well as the importance of ethical conduct in conducting research in both a domestic and in international business contexts. *Prerequisites: None*

BUSN 510 Intercultural Communication in Business (3 credits)
This course explores how to understand each other better in today's diverse global workplaces. We will look at how different cultures have different ways of thinking and how not understanding this can cause problems in organizations. We will focus on leadership and business communication in diverse settings. You will also learn how to analyze information to make good decisions in international situations. The course helps you improve your communication skills, both speaking and

writing, for discussions on cultural differences, being culturally competent, managing diversity, and ethical behavior at work. *Prerequisites: None*

BUSN 515 Introduction to Data Analysis for Decision-Making (3 credits)
This course introduces the methods and tools which help to systematically extract not only information but also insights from the data in various business functions, such as operations, supply chain, marketing, and finance. The course first covers the foundations of business analytics: decision making, definition and categories of business analytics, big data. Candidates will get hands-on experience by ethically analyzing real world business data using a state-of-the-art business analytics software. The course puts an emphasis on how to effectively communicate findings with business managers and other interested parties. *Prerequisites: None*

BUSN 520 Business Data Mining and Predictive Analytics (3 credits)
This course provides a comprehensive coverage of the most widely supervised and unsupervised methods such as logistic regression, k-nearest neighbor, naïve bayes, clustering, neural network, regularization, etc. This course also provides a strong theoretical foundation of predictive analytics and machine learning models in making both classifications and predictions based on big data. Using real world case studies, candidates learn how to ethically apply and implement the suitable techniques using state of the art business analytics software and present the findings effectively. *Prerequisites: None*

BUSN 599 Final Thesis Project (6 credits)
In this course, students will write a final thesis project applying the knowledge and skills they have learnt in the classroom. The topics chosen will reflect the students' aspirations to contribute novel insights to the field of business, with the potential to influence real organizational decisions and strategies. Throughout the course students will identify a research question or a problem within an organization. They will conduct a comprehensive literature review and then apply appropriate research methodologies and tools to address the research question or problem. Lastly, students will draw meaningful interpretations from the data and relate findings back to the literature or broader business implication. *Prerequisites: None*

CCHN 101 Spoken Mandarin (3 credits)
This spoken Mandarin L1 course is designed to introduce students to the fundamentals of spoken Mandarin. More specifically, students will be introduced to Mandarin and various dialects, the pronunciation of Modern Standard Chinese, and the Mandarin Pinyin system. They will also learn basic information about the Chinese Character writing system, and practice using common, routine expressions in the classroom. By the end of the course, students will be able to communicate appropriately and coherently with native speakers about basic topics and themes regarding daily life and academic situations. *(Pre-requisites: None)*

CHEM 101 Introductory Chemistry (3 credits)
This course will provide students with a comprehensive overview of the major areas of chemistry. Chemical principles for each topic under discussion are presented together with their foundation in atomic and molecular structure. Topics covered range from atomic theory to the descriptions of chemical reactivity and reactions, quantitative methods in chemistry, reactions in aqueous media and chemical kinetics and chemical equilibrium. Applications of chemistry are discussed throughout the lectures. *Prerequisites: None*

CHEM 101L Introductory Chemistry Laboratory (1 credit)
This course is an application of the general chemistry concepts studied in CHEM 101. The student carries out experiments including density, chemical equilibria, solutions, titrations, and standardizing solutions. Upon completion of the course the student will have gained a strong foundation for the further study of chemistry, and for the application of chemical principles in a variety of other fields.
Pre/Co-requisites: CHEM 101

CHEM 103 General Chemistry (3credits)
This course will provide students with a comprehensive overview of the major areas of chemistry. Chemical principles for each topic under discussion are presented together with their foundation in atomic and molecular structure. Topics covered range from atomic theory to the descriptions of chemical reactivity and reactions, heat transfer concepts, enthalpy and quantitative methods in chemistry, reactions in aqueous media and chemical bonding to chemical models on molecular structures. Applications of chemistry, "the central science" are discussed throughout the lectures.
Prerequisites: None

CHEM 103L - General Chemistry Lab (1 credit)
This course is an application of the general chemistry concepts studied in CHEM 103. The student carries out experiments including calculating enthalpy, nomenclature, solutions, and finding limiting reagent experiments. Upon completion of the course the student will have gained an overall foundation for the application of chemical principles in a variety of other fields. Pre/*Co-requisite: CHEM 103*

CIVL 121: Computer Graphics for the Built Environment (3 credits)
The building industry is increasingly reliant upon information systems to manage, implement, and operate interdisciplinary projects. Learn the fundamentals of current and future means of using computer-aided design systems to analyze, collaborate, develop, and communicate solutions to civil engineering projects. *Prerequisite: COSC 101*

CIVL 200 Engineering Mechanics – Statics (3 credits)
A vector treatment of the concepts and characteristics of forces and couples. Distributed forces. Center of mass; centroid of area. Equilibrium of particles and rigid bodies. Trusses and frames. Internal forces. Shear and moment distribution in beams. Area moment of inertia. The main purpose of this course is to develop the engineering student's ability to analyze static equilibrium problems in a logical manner. Emphasis is placed on an understanding of principles employed in the solution of problems rather than reliance on a rote process of substitution in numerous formulas.
Prerequisite: PHYS 101

CIVL 210: Statistical Methods for the Built Environment (3 credits)
This course consists of the application of statistical methods to civil and environmental engineering problems in construction, hydrology, water quality, air pollution, and other related areas. (Prerequisite: MATH 152)

CIVL 218: Surveying for Civil Engineering and Construction (3 credits)
This course is an introduction to the principles of plane surveying. Topics include measurement of horizontal distance, difference in elevation and angles; traverse surveys and computations;

horizontal and vertical curves; principles of stadia; topographic surveys; and earthwork. *Prerequisites: CIVL 210*

CIVL 302: Mechanics of Materials (3 credit)
Students will be introduced to the concepts of stress, strain, deflection; axial force, torsion, bending, combined stress, Mohr's circle, failure theories; design concepts, application to machines and vehicles *(Prerequisite: CIVL 200)*

CIVL 302L: Mechanics of Materials Laboratory (3 credits)
This course provides students an introduction to solid mechanics and laboratory procedure. More specifically the course involves studies in solid mechanics, experimental stress analysis and experimental confirmation of theory. *(Co-requisite: CIVL 302)*

CIVL 303: Engineering Geology (3 credits)
This course focuses on concepts of physical geology and the geologic processes relevant to civil and environmental engineering practices. Topics include: the nature and structure of earth, earth's history, formation of rocks, chemical and physical properties of minerals, and basic techniques for geologic field and site characterization. This course satisfies the requirement for a Science Elective for Civil Infrastructure and Environmental Engineering students. (Prerequisites: PHYS 101)

CIVL 321: Structural Analysis I (3 credits)
This course is an analysis of beams, frames, trusses and three-dimensional frameworks. Topics also include influence lines, deflections, introduction to statically indeterminate structures and moment distribution. *Prerequisites: CIVL 302*

CIVL 330: Construction Engineering and Management (3 credits)
This course offers a sampler of the broad construction engineering and project management topics. It covers the project management tools and practices as performed throughout the construction processes, including bidding; contract format and construction administration; construction documents; reading and interpreting contract plans; project planning and scheduling; resource management and project control; cash flow analysis; risk management and safety in construction. *Prerequisites: ENGR 100*

CIVL 355: Environmental Engineering (3 credits)
This course provides students with a background in the fundamental science and engineering principles of environmental engineering. A broad range of topics will be covered: water quality and treatment, atmospheric pollution, solid and hazardous waste management, noise pollution, soil contamination, climate change and clean energy, and green building design. *Prerequisite: CHEM 101*

CIVL 406: Civil Engineering Internship (3 credits)
This course provides students with the opportunity to practice on the job at an accounting department of a business organization or at an audit firm for a period of six to seven weeks, thereby

transferring and developing industry-specific, civil engineering, construction and other skills acquired from prior study. *Prerequisite: Senior standing (completing 90 credits) and CGPA 2.0*

CIVL 421: Reinforced Concrete Design (3 credits)
This course explores the properties and characteristics of reinforced concrete, the design of structural components, plastic theory and limit design. *Prerequisite: CIVL 321*

CIVL 430: Advanced Project Management (3 credits)
This course emphasizes the fundamental principles of modern management methods of planning and scheduling for construction projects. Covered topics include pre-bid planning; construction project planning using WBS; project network; estimating activity duration, CPM scheduling; resource management using resource allocation and leveling; project time-cost trade-offs; project monitoring and control; and, earned value analysis integrating cost and schedule. The course will also provide students with knowledge of the principles and practices of construction cost estimating. The course covers techniques used in estimating including: the principles of the estimating process, creating unit costs for labor and equipment resources, estimating earthwork and excavation, highways and pavements, concrete and steel structures, and masonry. (Prerequisites: CIVL 330)

CIVL 441: Structural Analysis II (3 credits)
This course explores statically indeterminate structures by virtual work. Topics also include advanced treatment of slope deflection, moment distribution, arch analysis, secondary stresses in trusses, advanced treatment of influence lines, and matrix analysis of structures. *Prerequisite: CIVL 321*

CIVL 444: Applied Hydraulics (3 credits)
This course presents the basic laws of fluid mechanics to hydraulic problems by focusing on open channel and pressure conduit flow, pumps and turbines, hydroelectric power, flood control and water law. *Prerequisite: MECH 451*

CIVL 445: Applied Hydrology (3 credits)
This course focuses on basic hydrologic principles, hydrologic measurements, small and midsize catchment hydrology, frequency analysis, regional analysis, reservoir, stream channel and catchment routing, and hydrologic design. *Prerequisite: CIVL 451*

CIVL 462: Geotechnical Engineering (3 credits)
This course focuses on the mechanics of soil as applicable to engineering problems, soil classification, compaction, swelling, consolidation, strength and permeability. Applications to geotechnical and environmental engineering problems are also discussed. *Prerequisite: CIVL 302*

CIVL 462L: Geotechnical Engineering Laboratory (1 credit)
This course is a laboratory experience that focuses on procedures of soil testing for geotechnical and environmental engineering problems. The Geotechnical Engineering Laboratory intends to train the

students in the field of testing of soils to determine their physical, index and engineering properties. *Co-requisite: CIVL 462*

CIVL 465: Foundation Engineering and Earth Retaining Structures (3 credits)
This course focuses on soil mechanic theories applied to design of shallow and deep foundations, as well as lateral pressure of soil and design of retaining walls. Review on physical and engineering properties of soils of principal interest for the analysis and design of foundation elements shall be considered. *Prerequisites: CIVL 462*

CIVL 481: Transportation Engineering (3 credits)
This course focuses on the physical design of transportation facilities, traffic analysis and control for different modes, planning and demand analysis, environmental impacts of transportation systems and intelligent transportation systems. *Prerequisite: CIVL 218*

CIVL 483: Traffic Engineering Design (3 credits)
This course focuses on sizing and configuration of highway facilities based on capacity analysis. Topics covered also include traffic signal design, impact and mitigation studies, parking and safety design. *Prerequisite: CIVL 481*

CIVL 491: Construction Methods (3 credits)
This course focuses on the components and methods of construction, including earthwork, foundations, wood, steel and concrete construction, roofing and cladding as well as interior construction. *Prerequisite: CIVL 321*

CIVL 499A: Civil Engineering Design: Capstone Project I (2 Credits)
course serves as the first part of a two-semester sequence. It provides students with the opportunity to apply their accumulated knowledge and skills in Civil engineering to a substantial, real-world project. Emphasizing teamwork, project management, and interdisciplinary collaboration, this course lays the foundation for the completion of a comprehensive engineering design project in the subsequent semester. *(Prerequisite: Senior level (90 credits), CGPA 2.0)*

CIVL 499B: Civil Engineering Design: Capstone Project II (2 Credits)
Building upon the foundation established in Capstone Project I, this course focuses on the implementation, testing, and refinement of the engineering design developed in the earlier phase. Working in teams, students will apply their technical knowledge and skills to design, build, and evaluate a solution to the identified problem or opportunity. They will follow a systematic approach to prototype development, perform rigorous testing, and iterate on the design based on feedback and evaluation results. Throughout the course, students will engage in critical analysis, problem-solving, and effective project management to address any challenges that arise during the implementation phase. Successful completion of this course will culminate in a fully functional and validated engineering solution, along with comprehensive documentation and a final presentation. (Prerequisite: CIVL 499A)

CMAD 121 History of Media, Art, and Design (3 credits)
History of Media, Art, and Design is a captivating course that examines the evolution and interplay of media, art, and design throughout history. From ancient civilizations to the modern digital age,

students will explore significant artistic movements, technological advancements, and cultural shifts that have shaped the fields of media, art, and design. *Prerequisite(s): None*

CMAD 131 Introduction to Mass Communication (3 credits)
This course allows students to understand Mass Communication and how digital media is transforming traditional mass media and gives a perspective on how media industries are responding to changes from globalization to social networking. *Prerequisite(s): None*

CMAD 141 Digital Media I (3 credits)
This course provides an overview of the role of the computer within the subject of creativity. The course content introduces extensive knowledge and skills on the use of vector-based graphics software and industry-leading layout design software for print and digital multimedia. *Prerequisite(s): None*

CMAD 142 Digital Media II (3 credits)
The course content introduces extensive knowledge and skills on the use of raster graphics, digital imaging, motion graphics, and visual effects software for print and digital multimedia. *Prerequisite(s): CMAD 141*

CMAD 201 Visual Culture I (3 credits)
This course introduces the essential concepts of visual culture. The role that images play in producing cultural meaning is examined. It focuses on how sight, knowledge and power are related, or on how to read images. Prerequisites: None

CMAD 202 Visual Culture II (3 credits)
This course focuses on visual experiences in the day-to-day life in the field of art, cinema, advertising, television, music videos and digital media, by using different approaches such as cultural studies, media and gender studies. *Prerequisite: CMAD 201*

CMAD 211 Photography Techniques (3 credits)
This course will focus on the technical and photographic aspects of the digital image including the use of digital camera (DSLR), digital camera features, modes of operation, photography techniques, effective use of light, storage media, connecting and downloading images to the computer, enhancing images via editing software, file size (resolution) issues, and printing. *Prerequisites: None*

CMAD 233 Fundamentals of Advertising (3 credits)
This course provides students with a broad overview of contemporary advertising theories and research. The course explains the functions of advertising and identifies the economic and social issues in the advertising industry. *Prerequisite(s): None*

CMAD 261 Video Production I (3 credits)
This course introduces the design and use of video equipment. Camera types, the working principles of the camera and TV system, lenses, camera movements, camera mounting equipment, and a basic knowledge of audio equipment are covered. Discussion also involves contemporary video production concepts and equipment, along with a basic history of technical development in this area. *Prerequisites: None*

CMAD 312 Photography Workshop (3 credits)
This course focuses on intermediate and advanced photography techniques. Students will learn advanced editing of photographs by using industry standard software and to manipulate photographs in post-production for both commercial and contemporary art photography. The course will introduce specialized workshops to cover different types of equipment for photography studio applications. *Prerequisite: CMAD 211*

CMAD 362 Video Production II (3 credits)
This course focuses on multi-camera studio production. The visual content and technical aspects of studio production are extensively covered. Content emphasizes the various responsibilities associated with studio production processes and participation in producing quality studio productions. *Prerequisite: CMAD 261*

CMAD 412 Media Law and Professional Ethics (3 credits)
Virtually every aspect of media practice has both a legal and an ethical dimension. The law tells us what we must (or must not) do; ethics suggests what we ought (or ought not) to do. The interplay of legal requirement and ethical obligation is what makes this course important. This course explores local, regional, and international laws regarding media production and distribution. In addition, ethical considerations will be discussed especially in the context of fast changing social media platforms. *Prerequisite(s): None*

CMAD 431 Entrepreneurship for Media and Design (3 credits)
This course introduces entrepreneurship and the process of starting a new business venture within the media and design industries. Students will explore the fundamental elements of entrepreneurship, including idea generation, market analysis, business modelling, financing, and launching a new enterprise. *Prerequisite(s): DSGN 331*

CMAD 495 Media Research Methods (3 credits)
With any profession, the understanding and practice of conducting research helps to understand and answer important questions, examine data, and make informed decisions. Use theoretical knowledge to critically review literature and apply research to solve problems. Learn about research terminology and ethical principles and challenges as they apply in multimedia and business environments. Compare elements of the research process within quantitative, qualitative, and mixed method approaches. Topics of study include analyzing different research methods, applying statistical analyses, and preparing research proposals. *Prerequisite(s): None*

CMPE 215 Communication Networks (3 credits)
The aim of the course is to understand the principles of operation and design choices of communication networks, as well as to learn the basic characteristics of the prevailing network technologies. The focus of the course is the Internet, covering issues related to the planning, implementation and operation of communication networks with emphasis on fundamental concepts and principles. ***(****Prerequisite: COSC 125****)***

CMPE 270 Digital Systems (3 credits)
Digital technology has become the core business of almost every manufacturing industry. This course gives an overview of circuitry, logic, and system design for understanding the impact of electrical and

computer engineering solutions in a global, economic, and societal context. It focuses on modeling, analysis, and design of digital systems, primarily at the logical design level. *(Prerequisite: Math 153)*

CMPE 270L Digital Systems Laboratory (1 credit)
This course focuses on practical modelling, analysis, and design of digital systems, primarily at the logic design level. Digital electronic topics include: the basic logic gates, Boolean algebra, number systems, digital arithmetic, combinational logic circuits, multiplexers, decoders and flip-flops, counters, and registers. ***(****Corequisite: CMPE 270****)***

CMPE 271 Computer Organization (3 credits)
In our lifetimes, we have seen unprecedented expansion of computational capabilities fueled both by advanced processing and architectural innovations to exploit that processing capability. As a result of these capabilities automatic computation is having a huge impact on the way we live, work, communicate, and especially how we do science and engineering. This course examines in-depth the inner-workings of modern digital computer systems and the tradeoffs present at the hardware-software interface. It provides insights in the design process of complex hardware systems. A digital design background is considered fundamental, and it is mandatory. *(Prerequisite: COSC 102, CMPE 270)*

CMPE 406 Computer Engineering Internship (3 credits)
This is a supervised internship course that provides computer engineering students with the opportunity to gain practical, hands-on experience in a professional work environment. The internship allows students to apply and further develop their knowledge and skills acquired throughout their academic studies. Under the guidance of industry professionals and academic supervisors, students engage in real-world projects, tasks, and responsibilities relevant to the field of computer engineering. *(Prerequisite: Senior level (90 Credits), CGPA 2.0)*

CMPE 410L: Computer Engineering Professional Certificate (1 credit)
This course prepares students for a globally recognized professional certification that establishes the needed credentials in IT support and computer hardware. This course provides a comprehensive overview of the essential knowledge and skills required to become a proficient computer technician. Students will learn about hardware and software troubleshooting, networking, operating systems, and security, gaining the necessary expertise to excel and launch a successful career in the IT industry. (Prerequisite: Senior Level (90 credits))

CMPE 412 Microprocessors (3 credits)
This course emphasizes on business design, memory design, interrupt structure and input/output for microprocessor-based systems. Topics include memory map and addresses, low-level/assembly language programming, bus architecture, input/output systems, interrupts, and other related topics. Upon completion, students should be able to interpret, analyze, verify, and troubleshoot fundamental microprocessor circuits and programs using appropriate techniques and test equipment. *Prerequisites: CMPE 271*

CMPE 425 Advanced IoT (3 credits)
The Internet of Things (IoT) is a networking paradigm consisting of sensors embedded in devices and in the environment. This course provides a comprehensive understanding of IoT systems and their applications. Topics include IoT devices programming, wireless network design and optimization,

edge-cloud IoT platforms, and IoT security. The course also covers applications of IoT such as smart cities, smart homes, environmental monitoring and health monitoring. *(Prerequisite: CMPE 412)*

CMPE 467 Network Management (3 credits)
This course covers the concepts and principles related to network management including network operation, security, and troubleshooting. The aim of the course is to give students the knowledge needed to securely establish, maintain, and troubleshoot the essential networks that businesses rely on. *(Prerequisite: CMPE 215)*

CMPE 470 Digital Circuits (3 credits)
With the rapid development in digital Hardware technology, digital design needs to be adaptive and fast to implement. This course introduces the design of digital systems using programmable logic devices such as memories, SPLDs, CPLDs and FPGAs. In this course, students acquire the knowledge to describe the behavior of logic systems, using finite state machine and ASM charts, and design methodologies for partitioning a digital system into a Datapath and controller. The course emphasizes modelling digital systems with VHDL and their implementation with FPGA. Students will learn to use industrial EDA tools such as Intel Quartus/Xilinx Vivado and ModelSim. *(Prerequisite: CMPE 270)*

CMPE 478 Embedded Systems Programming (3 credits)
This course focuses on embedded system architecture. Topics include IO programming using parallel ports, serial ports, timers, and D/A and A/D converters, as well as interrupts and real-time programming, program development and debugging tools and C language and assembler. *Prerequisites: CMPE 412*

CMPE 482: Robotics (3 credits)
This course provides students with a solid foundation in the field of robotics, with a focus on essential concepts of construction and programming of robots using Robotics Operating System (ROS) which provides an effective platform for robot software development. This course covers a variety of topics, such as: current state of the art research and applications in robotics, as well as designing, building, programming, and controlling robots. *(Prerequisite: COSC 372L)*

CMPE 499A: Engineering Design: Capstone Project I (1 credit)
This course serves as the first part of a two-semester sequence. It provides students with the opportunity to apply their accumulated knowledge and skills in computer engineering to a substantial, real-world project. Emphasizing teamwork, project management, and interdisciplinary collaboration, this course lays the foundation for the completion of a comprehensive engineering design project in the subsequent semester. *(Prerequisite: Senior level (90 credits), CGPA 2.0, SWEN 360, CMPE 470)*

CMPE 499B: Engineering Design: Capstone Project II (3 credits)
Building upon the foundation established in Capstone Project I, this course focuses on the implementation, testing, and refinement of the engineering design developed in the earlier phase. Working in teams, students will apply their technical knowledge and skills to design, build, and evaluate a solution to the identified problem or opportunity. Students are expected to follow a systematic approach to prototype development, perform rigorous testing, and iterate on the design based on feedback and evaluation results. Throughout the course, students will engage in critical

analysis, problem-solving, and effective project management to address any challenges that arise during the implementation phase. Successful completion of this course will culminate in a fully functional and validated engineering solution, along with comprehensive documentation and a final presentation. *(Prerequisite: CMPE 499A)*

COMS 356 Intercultural Communication (3 credits)
Cultural factors in interpersonal communication, such as perception, roles, language codes and nonverbal communication. Students will apply and evaluate theories of intercultural communication. *(Prerequisites: ENGL 101)*

COSC 101: Introduction to Computing (3 credits)
This course is designed to provide students with the core competencies of computing literacy and computational thinking, which are essential skills in the digital information age. The course provides an overview of computer systems—hardware, software and networks. Students will practice using essential computing programs, and will develop computational solutions to basic problems. The course also covers social and ethical issues related to computing. Prerequisites: None

COSC 102: Object-Oriented Programming (3 credits)
This course introduces the fundamental concepts of Object-Oriented Programming (OOP). Students will learn how to design, implement, and test software using the OOP paradigm. The course covers topics such as encapsulation, inheritance, polymorphism, abstraction, and object-oriented design patterns. The course will be taught using a programming language. (Prerequisite: COSC 101)

COSC 125 Data Structure and Programming Techniques (3 credits)
Data structures are essential building blocks for designing efficient algorithms. This course will introduce the fundamentals of data structures and will provide a thorough understanding of how to systematically organize data in a computer system. In addition, this course will introduce students to analytical tools for comparing data structures in terms of their time and space complexities. Students will appreciate the importance of programming structures, abstractions, and algorithms for improving the efficiency of computer programs. Topics include linked lists, stacks, trees, queues, graphs and analysis of efficiency. The course also covers searching, sorting, and hashing techniques. *Prerequisite: COSC 102*

COSC 210 Management Information Systems (3 credits)
The main objective of this course is the investigation of the role and impact of information systems used in today's business environment. The course highlights the role of information systems in organizations using computer tools and technology in solving business problems. Topics include information technology hardware, software, networks, security, and ethics. The course uses a conceptual approach through case studies of a series of information systems such as Enterprise Resource Planning Systems (ERP), Customer Relationship Management Systems (CRM), Supply Chain Management Systems (SCM) and Decision Support Systems. Students will also engage in computing exercises using common business information system tools. *Pre-requisite: COSC 101*

COSC 215 Communication Networks (3 credits)

The aim of the course is to understand the principles of operation and design choices of communication networks, as well as to learn the basic characteristics of the prevailing network technologies. The focus of the course is the Internet, covering issues related to the planning, implementation and operation of communication networks with emphasis on fundamental concepts and principles. *Pre-requisite: COSC 125*

COSC 248 Algorithms and Complexity (3 credits)
The course covers topics on technical analysis and runtime algorithms, asymptotic notation, some data structures such as graphs, sorting and searching algorithms and algorithm design techniques. The course covers the application of standard algorithmic approaches, including greedy, divide and conquer, and dynamic programming. Students will also learn about basic graph algorithms and NP-completeness. *Prerequisite: MATH 203, COSC 125*

COSC 312 Design and Usage of Databases (3 credits)
This course introduces the fundamental concepts necessary for designing, using, and implementing database systems and database applications. It will teach students about data modeling techniques, relational database design, use of normalization to design normalized relational databases, Structured Query Language's (SQL), data definition (DDL), data manipulation (DML), and web database development. *Prerequisite: MATH 203 and COSC 125*

COSC 372 Operating Systems (3 credits)
This course provides an in-depth understanding of modern operating systems, covering core concepts and principles. Key topics include operating system structures, process management, thread management, CPU scheduling, process synchronization, deadlock handling, memory management, virtual memory, mass storage, and file system management. The course aims to teach students about the operating system's role as an interface between the user and computer hardware, focusing on both high-level functionality and low-level implementation details of CPU scheduling, processes, memory management, file system management, and virtualization. It emphasizes how operating systems act as a critical bridge in computer systems, delving into the intricate workings of these components at a detailed level. *(Prerequisite: CMPE 271)*

COSC 372L Operating Systems Laboratory (1 credit)
This course covers the Unix system administration and practical concepts and principles that underlie modern operating systems including Processes, Threads, Synchronization, Inter-Process Communication, Deadlock and Disk Scheduling. *(Co-requisite: COSC 372)*

COSC 390: Introduction to Machine Learning and Data Analytics I (3 credit)
Machine learning is the science of getting computers to act without being explicitly programmed. In the past decade, machine learning has given us self-driving cars, practical speech recognition, effective web search, a vastly improved understanding of the human genome, and progress towards human-level AI. Topics include effective machine learning techniques and techniques for implementation. (Prerequisite: Math 260)

COSC 406 Computer Science Internship (3 credits)

This course provides practical experience for students in the field of computer science, bridging the gap between classroom learning and real-world application. Students work in a professional setting related to their field of study, applying their knowledge to solve real-world problems, and gaining industry experience. The course focuses on developing technical skills, project management, teamwork, and communication. Students work closely with supervisors, following guidelines and best practices. *Prerequisites: Senior standing (completing 90 credits), CGPA 2.0*

COSC 410L: Computer Science Professional Certificate (1 credit)
This is a comprehensive course designed to prepare students for IT Project management certification. The course covers project management principles, methodologies, and best practices. Students will learn how to plan, execute, monitor, and close projects successfully. Through hands-on projects and real-world scenarios, students will develop their project management skills and become proficient in managing projects in various industries. *(Prerequisite: Senior Level (90 credits))*

COSC 412 Implementation of Database Systems (3 credits)
The course covers some key issues related to the organization and storage of data to external storage. The specific topics discussed include the concept of file storage peripherals and physical characteristics, layout and sort files located on disks, primary file organization, secondary file organization, static and dynamic data structures, Indexed Sequential Access Method (ISAM), static and dynamic fragmentation, B+ trees and multidimensional data structures. *Prerequisite: COSC 312*

COSC 415: Cloud Computing (3 credits)
This is an advanced course that explores the concepts, technologies, and practical aspects of cloud computing. Students will gain a deep understanding of cloud architectures, services, deployment models, and security considerations. Through hands-on exercises and projects, students will learn to design, deploy, and manage cloud-based solutions. *(Prerequisite: COSC 372)*

COSC 485Web Engineering (3 credits)
Web Engineering introduces a structured methodology utilized in software engineering to Web development projects. The course addresses the concepts, methods, technologies, and techniques of developing Web sites that collect, organize and expose information resources. Topics covered include requirements engineering for Web applications, design methods and technologies, interface design, usability of web applications, accessibility, testing, metrics, operation and maintenance of Web applications, security, and project management. Prerequisite: COSC 312

COSC 486: Mobile Programming (3 credits)
The aim of this course is to equip students with a solid foundation in specialized mobile programming concepts. Throughout this course, students will develop the skills to apply design principles in the creation of user-centered mobile applications that align with business requirements. Hands-on activities will allow them to gain practical experience in a mobile programming language, enabling them to become proficient in mobile app development. *(Prerequisite: COSC 312)*

COSC 499A Computer Science Design Project A (3 credits)

This course serves as the first part of a two-semester sequence. It provides students with the opportunity to apply their accumulated knowledge and skills in computer science to a substantial, real-world project. Emphasizing teamwork, project management, and interdisciplinary collaboration, this course lays the foundation for the completion of a comprehensive computer science design project in the subsequent semester. *(Prerequisite: Senior level (90 credits), GPA 2.0, SWEN 360/L)*

COSC 499B: Computer Science Design Project B (3 credits)
Building upon the foundation established in Capstone Project A, this course focuses on the implementation, testing, and refinement of the computer science design developed in the earlier phase. Working in teams, students will apply their technical knowledge and skills to design, build, and evaluate a solution to the identified problem or opportunity. They will follow a systematic approach to prototype development, perform rigorous testing, and iterate on the design based on feedback and evaluation results. Throughout the course, students will engage in critical analysis, problem-solving, and effective project management to address any challenges that arise during the implementation phase. Successful completion of this course will culminate in a fully functional and validated ccomputing solution, along with comprehensive documentation and a final presentation.
(Prerequisite: CMPE 499A)

CULT 101 Cultural Criticism (2 credits)
This course will provide students with a general framework for analyzing various aspects of cultural theory and practice. Beginning with an introduction to cultural criticism, students will obtain the theoretical knowledge necessary to assess the material world around them, and the one which individuals (and the societies that they create) inhabit. Students will learn to evaluate the various characteristics which inform our interactions with that world and the cultural factors which inform and shape those interactions.
(Pre-requisites: ENGL 101)

CYBR 310: Introduction to Cybersecurity (3 credits)
This course provides an overview of the fundamental concepts and principles of cybersecurity. The course covers topics such as information security, network security, and cybersecurity policies and practices. The course is designed to provide students with an understanding of the importance of cybersecurity in modern society and the tools and techniques used to protect against cyber-attacks.
(Prerequisite: CMPE 215)

CYBR 315: Network Security and Forensics Analysis (3 credits)
This course focuses on the principles and techniques of securing computer networks and analyzing digital evidence. The course covers topics such as network security concepts, network attacks and defenses, cryptography, digital forensics, and incident response. The course is designed to provide students with an understanding of the principles and techniques for securing computer networks and investigating cybercrime.
(Prerequisite: CMPE 215)

CYBR 362: Security Vulnerabilities and Threats (3 credits)
This course provides an in-depth analysis of the various security vulnerabilities and threats that modern computer systems and networks face. The course covers topics such as cryptography, malware, network security, social engineering, and ethical hacking. The course is designed to

provide students with an understanding of the different types of security vulnerabilities and threats, the techniques used by attackers, and the strategies for defending against these attacks.
(Prerequisite: CYBR 310)

CYBR 375: Cybercrime (3 credits)
This course focuses on the study of cybercriminal activities and the methods for preventing, detecting, and investigating them. The course covers topics such as the types of cybercrime, cybercrime laws, cybercrime investigation techniques, digital forensics, and cybercrime prevention. The course is designed to provide students with an understanding of the nature and scope of cybercrime and the techniques for mitigating the risks of cybercrime.
(Prerequisite: CYBR 310)

CYBR 405: Cybersecurity Internship (3 credits)
This course provides students with the opportunity to apply their knowledge and skills in a real-world environment. The internship is typically offered by companies, government agencies, or non-profit organizations with a focus on cybersecurity.
(Prerequisite: Senior Level (90 Credits))

CYBR 415: Cloud Security and Privacy (3 credits)
This course provides an in-depth understanding of the security and privacy issues in cloud computing. The course focuses on the concepts, principles, and techniques for ensuring the security and privacy of data and applications in cloud environments.
(*Prerequisite: CMPE 215****)***

CYBR 410L: Cybersecurity Professional Certificate (1 credit)
This course provides students with the knowledge and skills required to protect and defend computer systems and networks from cyber threats. It will prepare students to take a professional certificate in cybersecurity that covers a range of topics related to cybersecurity, including network security, cryptography, security standards, and cybercrime. The course also includes hands-on laboratory exercises and real-world case studies to provide students with practical experience in cybersecurity.
(Prerequisite: Senior Level (90 Credits))

CYBR 460: Secure Software Design and Engineering (3 credits)
This course focuses on the development of secure software systems. The course covers topics such as secure software design, secure coding practices, threat modeling, security testing, and software vulnerabilities. The course is designed to provide students with an understanding of the importance of secure software design and the techniques for developing secure software systems.
(Prerequisite: SWEN 360)

CYBR 462: Information System Risk Management (3 credits)
This course focuses on the identification, analysis, and management of risks associated with information systems. The course covers topics such as risk management frameworks, risk assessment methodologies, risk mitigation strategies, and risk monitoring and control. The course is designed to provide students with an understanding of the principles and techniques for managing information system risks and ensuring the confidentiality, integrity, and availability of information.
(Prerequisite: CYBR 362)

CYBR 465: Web Applications Security (3 credits)
This course provides an in-depth understanding of the security issues related to web applications. The course focuses on the concepts, principles, and techniques for securing web applications and protecting against web-based attacks.
(*Prerequisite: COSC 312, CYBR 310****)***

CYBR 467: Ethical Hacking (3 credits)
This course provides in-depth understanding of the techniques and tools used by ethical hackers to assess the security of computer systems and networks. The course focuses on the legal and ethical aspects of hacking and the use of hacking techniques to identify and mitigate security vulnerabilities.
(*Prerequisite: CYBR 362****)***

CYBR 470 Cryptography (3 credits)
This course focuses on the study of techniques for secure communication in the presence of adversaries. The course covers topics such as classical ciphers, modern symmetric and asymmetric key cryptographic systems, cryptographic protocols, and cryptanalysis. The course is designed to provide students with an understanding of the principles and techniques for designing and analyzing secure communication systems. *(Prerequisite: MATH 203)*

CYBR 475: Cyber Incident Handling and Response (3 credits)
This course provides an overview of the incident response process, including preparation, identification, containment, eradication, recovery, and lessons learned. The course covers the tools and techniques used to identify and respond to cybersecurity incidents, as well as the best practices for managing incident response teams.
(*Prerequisite: CYBR 310****)***

CYBR 480: Security Standards and Audits (3 credits)
This course focuses on the study of security standards, regulations, and compliance audits in the context of information security. The course covers topics such as security frameworks, standards, regulations, and best practices, as well as audit methodologies, tools, and techniques. The course is designed to provide students with an understanding of the importance of security standards and audits in maintaining the confidentiality, integrity, and availability of information.
(Prerequisite: CYBR 362)

CYBR 482: Information Technology Audit and Control (3 credits)
This course introduces the principles and practices of auditing and controlling information technology systems. The course covers the legal, ethical, and regulatory aspects of IT auditing and control, as well as the tools and techniques used by IT auditors and control professionals.
(*Prerequisite: CYBR 310****)***

CYBR 487: Cybersecurity Framework and Management (3 credits)
This course provides an overview of cybersecurity frameworks, their application, and management in organizations. The course covers the various cybersecurity frameworks, standards, and guidelines used to assess and manage cybersecurity risks, as well as the best practices for implementing cybersecurity frameworks in organizations.
(*Prerequisite: CYBR 310****)***

CYBR 495A: Cybersecurity Design Project A (1 credit)
This course is a project-based course that allows students to apply their knowledge and skills in cybersecurity to a practical project. The course focuses on developing a cybersecurity solution to a real-world problem, and students work in teams to design and implement a comprehensive cybersecurity solution.
(Prerequisite: Senior Level (90 Credits), and GPA greater than or equal 2.0)

CYBR 495B: Cybersecurity Design Project B (3 credits)
This course is a continuation of Cybersecurity Design Project A, where students continue to work on their cybersecurity project from the previous course. The focus of the course is on implementing and testing the cybersecurity solution designed in Cybersecurity Design Project A, as well as evaluating the effectiveness and security of the implemented system
(Prerequisite: CYBR 395A)

DSAI 310: Introduction to Data Science (3 credits)
This course serves as an introduction to the multifaceted field of Data Science, providing students with foundational knowledge and skills necessary for working with data, in addition to foundational concepts in machine learning. The course covers essential concepts, techniques, and tools employed in the data science workflow, including data collection, cleaning, exploration, analysis, and visualization. Students will gain hands-on experience with popular data science tools and languages, fostering an understanding of how data science is applied in various domains. (Prerequisite: MATH 260, COSC 102)

DSAI 370: Data Analytics Ethics (3 credits)
This is a specialized course focusing on the ethical considerations and challenges within data analytics. This course delves into the complex intersection of data, technology, and ethical decision-making. Students will explore the ethical implications of data collection, analysis, and utilization, with a particular emphasis on maintaining privacy, ensuring fairness, and addressing societal impacts. (Prerequisite: DSAI 310)

DSAI 380: Data Visualization (3 credits)
This is a specialized course focusing on the principles, techniques, and applications of data visualization. In an era of vast and complex datasets, effective data visualization is essential for conveying insights and supporting decision-making. This course explores various visualization tools, design principles, and methods for creating compelling visual representations of data. *(Prerequisite: DSAI 310)*

DSAI 406: Data Science Internship (1 credit)
This is a supervised internship course that provides data science and artificial intelligence students with the opportunity to gain practical, hands-on experience in a professional work environment. The internship allows students to apply and further develop their knowledge and skills acquired throughout their academic studies. Under the guidance of industry professionals and academic supervisors, students engage in real-world projects, tasks, and responsibilities relevant to the field of data science and artificial intelligence. *(Prerequisite:* Senior level (90 Credits), CGPA 2.0*)*

DSAI 410L: Data Science Professional Certificate (1 credit)

This course is designed to prepare students for a Data Science Professional Certificate. The course delves into the fundamental concepts, methodologies, and practical applications of data science. It covers a range of topics related to data science and artificial intelligence, including data analysis, machine learning, and data visualization. The course also includes hands-on laboratory exercises and real-world case studies to provide students with practical experience in data science and artificial intelligence. *(Prerequisite: Senior Level (90 Credits))*

DSAI 420: Marketing Analytics (3 credits)
This is an advanced course that provides an in-depth exploration of concepts and methods of marketing analytics. Students will learn how to apply data science techniques to measure and optimize marketing performance and outcomes. The course covers topics such as customer analysis, segmentation, targeting, preference measurement, demand estimation, customer lifetime value, retention, price optimization, advertising effectiveness, A/B testing and personalization. The course provides hands-on experience with various data sources, tools, and software for marketing analytics. *(Prerequisite: DSAI 310)*

DSAI 422: Data Mining (3 credits)
This is an advanced course that delves into the field of Data Mining, exploring techniques and methodologies for discovering patterns, trends, and valuable insights within large datasets. The course covers a range of data mining algorithms, statistical models, and machine learning approaches to extract meaningful information from complex data sources. Students will engage in hands-on projects to apply data mining techniques in various domains and gain practical experience in uncovering hidden knowledge from diverse datasets. *(Prerequisite: DSAI 310)*

DSAI 448: Sports Analytics (3 credits)
This course introduces the concepts and methods of sports analytics, which is the use of data and quantitative techniques to analyze performance and make decisions in sports. The course covers topics such as measuring and predicting player and team performance, decision-making and strategy in sports, artificial intelligence, and machine learning in sports. The course also provides hands-on experience with various data sources, tools, and software for sports analytics. *(Prerequisite: DSAI 310)*

DSAI 450: Business Intelligence (3 credits)
This Business Intelligence course provides an in-depth exploration of BI's role in modern organizations, focusing on practical applications and current technologies. Students will engage with BI tools and advanced techniques, developing skills in data visualization and predictive analytics. The syllabus covers real-time analytics, mobile BI applications, and cloud computing in BI, enhancing students' understanding of dynamic data analysis and decision-making processes. Additionally, the course addresses data quality management, ethical considerations, and BI governance, preparing students to effectively manage and utilize BI systems across various industries. Through practical exercises and industry-specific case studies, the course equips students with the skills to apply BI concepts effectively, ensuring a comprehensive and practical understanding of Business Intelligence in a real-world context. *(Prerequisite: DSAI 465)*

DSAI 460: Internet of Things Analytics (3 credits)

This course introduces the concepts and methods of IoT analytics, which is the analysis of data generated by connected devices and sensors in the Internet of Things (IoT). The course covers topics such as IoT data sources, types, and characteristics, IoT data collection, storage, and processing, IoT data quality, security, and privacy, IoT data analysis techniques and tools, IoT data visualization and communication, and IoT data applications and use cases. The course provides hands-on experience with various IoT data sets, platforms, and software. *(Prerequisite: DSAI 310)*

DSAI 462: Advanced Computational Statistics (3 credits)
This is an advanced course that delves into the intricate aspects of computational statistics. It is designed for students seeking a deep understanding of advanced statistical techniques and their computational implementations. Topics include advanced probability distributions, Bayesian statistics, Monte Carlo methods, and advanced statistical modeling. *(Prerequisite: DSAI 310)*

DSAI 465 Artificial Intelligence (3 credits)
The main objective of this course is to introduce the theory and practice of Artificial Intelligence (AI). This course is designed to develop an understanding of the fundamental issues associated with the field such as problems and search, knowledge representation and reasoning, game playing and rule-based systems. Advanced topic areas such as probabilistic reasoning and Bayesian networks are also introduced. *Prerequisite: DSAI 310 or CMPE 390*

DSAI 472: Social and Behavioral Analytics (3 credits)
The course aims to provide students with a comprehensive understanding of the principles, data sources and methods of social and behavioral data analytics. Students will learn to use data science methods to obtain digital social data and answer research questions in psychology and social sciences. The course will cover topics such as research design, data acquisition through APIs and web scraping, data cleaning and processing, data analysis with advanced techniques, and the interpretation and presentation of results. The course will also focus on research integrity and ethics in social data science projects. *(Prerequisite: DSAI 310)*

DSAI 474: Computer Vision (3 credits)
This course is a broad and comprehensive introduction to computer vision. The course covers computational techniques and methods for extracting meaningful information from visual inputs. Topics include image analysis, object detection, image segmentation, feature extraction and pattern classification. Students will also be introduced to modern real-world applications of computer vision in various fields such as robotics, graphics, medicine and manufacturing. *(Prerequisite: MATH 260, COSC 125)*

DSAI 482: Big Data Technologies (3 credits)
This is an advanced course that provides an in-depth exploration of the principles, technologies, and practical applications of Big Data. As organizations grapple with the challenges posed by massive volumes of data, this course equips students with the skills to navigate and harness the power of Big Data technologies. The curriculum encompasses key concepts in distributed computing, storage systems, and data processing frameworks. *(Prerequisite: DSAI 310)*

DSAI 499A: Data Science Design Project A (1 credit)

This course is a project-based course that allows students to apply their knowledge and skills in data science and artificial intelligence to a practical project. The course focuses on developing a data science and artificial intelligence solution to a real-world problem, and students work in teams to design and implement a comprehensive data science solution. *(Prerequisite:* Senior Level (90 credits), CGPA 2.0, SWEN 360/L).

DSAI 499B: Data Science Design Project B (3 credits)
This course is a continuation of Data Science Design Project A, where students continue to work on their data science and artificial intelligence project from the previous course. The focus of the course is on implementing and testing the data science and artificial intelligence solution designed in data science Design Project A, as well as evaluating the performance and effectiveness of the implemented solution. *(Prerequisite: DSAI 499A)*

DSGN 111 Basic Design I (3 credits)
This course focuses on equipping the designer with the keys to the realm of concrete visual thinking and the ability to translate concepts, subjects, themes or narratives into visual language. The course also focuses on translating written or spoken word into visual symbols through 2D compositions.
Prerequisites: None

DSGN 112 Basic Design II (3 credits)
This course focuses on the text and the meaning and effects of visual language. Different aspects of art and design will be examined over the examples of two-and three-dimensional space by using a variety of tools *Prerequisite: DSGN 111, DSGN 141*

DSGN 141 Computer Culture I (3 credits)
This course provides an overview of the role of the computer within the subject of creativity. Course content introduces extensive knowledge about computers, information networks, multimedia environments and issues related to design and innovation processes that involve computers. *Prerequisites: None*

DSGN 142 Computer Culture II (3 credits)
This course develops understanding of the emerging cybercultures and virtual worlds necessary for efficient utilization in both professional and personal tasks. This course identifies the key issues with cybercultures and virtual worlds and explores the relationship of computers to design and the media. *Prerequisite: DSGN 111*

DSGN 201 Typography (3 credits)
This course focuses on the fundamentals of typography history, technology, and theory. Course content emphasizes the study of letterforms, typographic composition, typographic expression and communication, the power and role of typography in constructing meaning, and typography as a tool for representation of concepts. *Prerequisite: DSGN 141*

DSGN 210 Digital Storytelling (3 Credits)
Introduction to practical writing for visual and interactive media. Introduces concepts of interweaving traditional storytelling with digital platforms and interactivity in both fictional and non-fictional stories for web, games, social media, video, and mobile devices. *Prerequisites: None*

DSGN 323 Sound and Image (3 credits)
This course emphasizes combining and composing visual and audio media for timeline multimedia formats. Primary focus is given to the production of video which includes 2-D animation using any combination of music, sound effects, recorded live sounds, computer-generated "noise," digitized video, non-interlaced video, alpha masked video, sprite animations, still bitmap images, and vector images. *Prerequisites: None*

DSGN 232 Digital Vector Graphics (3 credits)
The course will focus on vector drawings and illustration development by using standard illustration application to create multimedia digital and printed vector graphics. Students will learn how to draw, edit, fill, transform, implement effects vector graphics shapes and typeface. *Prerequisite: DSGN 141*

DSGN 241 Concept Development I (3 credits)
This course focuses on the cultivation of ideas and problem-solving strategies for multimedia projects. Course content emphasizes the acquisition of skills for generating ideas and concepts through a variety of methodologies. Students will advance their skills in professional software. *Prerequisite: DSGN 112*

DSGN 244 Digital Image Processing (3 credits)
This course introduces photographic image modification using computer technology. Student will integrate set of tools to manipulate photographic imagery by using various image editing features, advance composting, and techniques to prepare multimedia artwork to be implemented digital or printed by using standard image application. *Prerequisite: DSGN 142*

DSGN 301 Web Design (3 credits)
This course is a survey of the key design elements of publishing content on the World Wide Web. Course content includes processes such as concept development for interactive design works, information design, interface design, interaction design, optimization and integration for the Web, usability, beta-testing, etc., as well as the basic principles of publishing and managing visual content for hypermedia and an interactive portal site. Tools for creating and editing Web projects include browsers, browser helper applications, HTML editors, document management tools and image editors. *Prerequisites: None*

DSGN 302 Interactive Web Projects (3 credits)
This course expands upon the ideas introduced in DSGN 301 with further development in coding and software skills. The focus is on the use of the web and social media applications in marketing and advertising. Topics include branding, user identification, user needs, project planning, developing rich media content, interface design, site promotion, and creating a social media campaign. *Prerequisite: DSGN 301*

DSGN 319 Compositing and Digital Effects (3 credits)
This course introduces the basics of image manipulation, title design, compositing, graphic design and special visual effects for digital postproduction using various software applications. Areas of application like chroma keying, CGI integration, and multilayer compositing are probed. Students will work with professional standard software. *Prerequisite: DSGN 142*

DSGN 321 Introduction to Multimedia Design (3 credits)

This course is intended to give the students a broad foundational understanding of the multimedia design field along with an introduction to some of the essential tools. The focus is on the process of multimedia design and introduces the theories of project management. Students will advance knowledge about industry standard software. *Prerequisites: None*

DSGN 331 Multimedia Design (3 credits)
The course focus on multimedia design development, creating user experience design skills as well as interaction design skills. Students will be expected to design work that combines appropriate multimedia content to meet the design brief. *Prerequisite: DSGN 321*

DSGN 332 Multimedia Production (3 credits)
This course continues the work begun in DSGN 331 and applies the process of multimedia production, and project management, culminating in a completed multimedia experience ready to be delivered to the end user. Every aspect of a multimedia production is planned, designed, edited, programmed, and tested. A user testing report will also be included in the process. *Prerequisite: DSGN 331*

DSGN 341 3-D Computer Graphics (3 credits)
This course introduces 3-D modeling and rendering software, basic modeling concepts and techniques, methods on how to create materials, scenes rendered with digital lights and cameras, and providing a perspective on the 3-D digital design and virtual environments. Students will work with industry standard software. *Prerequisite: DSGN 142*

DGSN 383 Social Media (3 Credits)
Theoretical and practical introduction to Social Media and its role in the media experience. Students will research how social media has transformed personal and business communication with a particular focus on their own discipline. Significant practical work with current Social Media platforms. Introduction to data analytics is also covered. *Prerequisites: None*

DSGN 401 Capstone Project I (6 credits)
This course focuses on the methodological basis of a capstone project focusing on progression of the concept and developing the skills needed to understand and carry out a research-based visualization process. *Pre-requisite: DSGN 332, Senior Level standing 90cr.*

DSGN 405 Multimedia Design Internship (3 credits)
This course is a supervised professional experience in a professional workplace that provides hands on experience in multimedia and design, in either the private or public sector. At the conclusion of the internship each student will present a report summarizing the internship experience. Potentially, this experience may lead to generate ideas for capstone course. *Prerequisites: 90 Credits and a minimum CGPA of 2.00*

DSGN 411 Physical Interaction Design (3 credits)
The course introduces physical interaction design in new media works with microcontroller and sensor technologies and explores interaction design practices adaptable for physical interaction, daily-life applications, and contemporary art works. Course content also introduces artistic strategies, structures, and methodologies for the creation of interactive installations and physical media-image-sound interaction projects. *Prerequisite: DSGN 341*

DSGN 412 Media Law and Ethics (3 credits)
Virtually every aspect of media practice has both a legal and an ethical dimension. The law tells us what we must (or must not) do; ethics suggests what we ought (or ought not) to do. The interplay of legal requirement and ethical obligation is what makes this course important. This course explores local, regional, and international laws regarding media production and distribution. In addition, ethical considerations will be discussed especially in the context of fast changing social media platforms. *Prerequisites: None*

DSGN 421 Data Analytics and Visualization (3 credits)
Data is everywhere in our society. Everything is data from scientific research to everyday human activity. The ability to understand and communicate data is becoming an essential skill in this era of big data. Visualization leverages our visual perception to provide a powerful yet accessible way to make sense of large and complex data. This course examines basic principles on how to design effective visualization for data analysis and communication. *Prerequisites: None*

DSGN 430 Project Management for Creative Industries (3 credits)
This course advances skills of project management with an emphasis on the creative industries (design, media etc.) Students will work with industry standard software to plan, estimate resources and pilot the progress of the project. Additionally, students will get a practical overview of the human aspects of project management. Students are expected to enroll in this class Co-requisitely with DSGN 401.

ECON 201 Principles of Microeconomics (3 credits)
This class is an introduction to economics as it applies to the functioning of markets, businesses and households. Students learn how individuals make decisions about how to use scarce resources efficiently and how these decisions affect markets and the overall economy. Effect of government policies on the functioning of markets is also examined. *Pre-requisites: None*

ECON 202 Principles of Macroeconomics (3 credits)
This course introduces the analysis of a market economy. Emphasis will be on the measurement and determinants of aggregate economic performance, including output, income, employment, prices, interest rates, and economic growth. Consideration will be given to the role of the monetary and banking system, the Federal Reserve, government fiscal policy, and the global economy in influencing domestic business cycles, inflation and growth. *Pre-requisites: ECON 201*

ECON 311 Foundation in Economics (0 credits)
The course gives candidates an insight into some of the key elements of both micro and macro-economics, providing a solid foundation and sound understanding for the varied field of economics. A focus is given to the demand and supply model, elasticities, the functions of money and the role the central bank, market structures, economic growth, inflation, equilibrium in the macro-economy and government policies. *Prerequisite: None*

ECON 341 Engineering Economic Analysis (3 credits)
The systematic evaluation of the economic benefits and costs of projects involving engineering design and analysis. Economic decision-making in an environment of limited resources and uncertainty. Present economy, the economy of multi-year projects, selection among competing and independent

alternatives, sensitivity of outcomes to input parameters, before- and after-tax analyses, replacement economy, inflation, and breakeven analysis in production environments. *Prerequisite: MATH 152*

ECON 510 Managerial Economics and Business Analytics (3 credits)
Managerial Economics is the use of economic theory, mathematical and statistical techniques to examine how a firm can make optimal managerial decisions given the constraints it faces. The main objective of this course is to equip students with the necessary theory and techniques and the ability to apply them to inform and enhance managerial decision making. *Prerequisite: None*

ELEC 204 Principles of Electrical Engineering (3 credits)
This course provides an overview of circuit analysis by reduction methods, source transformations, and mesh and nodal analysis. This course introduces the fundamentals of DC (Direct Current) machines (Motors, Generators) and transformers. The students will be able to define, identify and categorize the devices that make up rotating machinery. The students will also learn the distinctive characteristics of rotating machinery and transformers along with electric power transmission. ***(****Prerequisite: PHYS 102****)***

ELEC 320: Circuit Analysis (3 credits)
This course introduces students to the principles and techniques of DC and AC circuit analysis. The circuit analysis is performed in both time and frequency domains. The students are also introduced to the transient and steady-state behaviour, with a focus on first order and second order passive circuits. The Laplace transform is introduced to solve circuit analysis problems with a variety of input functions, illustrating the use of electrical circuits as frequency-selective filters. An Illustrative use of computer simulation software is adopted in parallel with classical problem-solving approaches. *(Prerequisite: PHYS 102, MATH 154)*

ELEC 330 Fundamentals of Engineering Electronics (3 credits)
The rapid evolution of electronics has revolutionized every aspect of human life. This course develops the principles and the applications of solid-state electronic devices such as diodes, JFETs, MOSFETs, and BJTs in typical electronic circuits. The students are expected to acquire a full analysis and design of circuits such as AC signal rectifiers, filters, and simple amplifiers using diodes, transistors and operational amplifiers. Theoretical understanding will be consolidated using a dedicated software for circuit design and analysis. *(Prerequisite: ELEC 320)*

ENGL 101 Composition I (3 credits)
ENGL 101 introduces the conventions of academic writing and critical thinking and teaches the writing skills necessary for success in college. Read and respond to a variety of texts from different disciplines and produce academic texts using a range of critical thinking and rhetorical strategies. Learn how to apply APA documentation style to ethically document sources in texts and reference lists. The course is designed to provide guided practice in the multi-step process of academic writing. *Pre-requisites: None*

ENGL 102 Composition II (3 credits)
ENGL 102 introduces the conventions of research writing and teaches how to produce research papers using critical thinking and analytical skills in response to a variety of academic texts. The

course is designed to provide guidance in all steps of the research process including choosing a topic, designing a research methodology, analyzing data, and writing up and presenting results.
Pre-requisites: ENGL 101

ENGL 103 Public Speaking (3 credits)
ENGL 103 helps students understand the nature of public speaking and develop techniques to improve their public speaking skills. In the course, students will practice planning, preparing, and delivering various types of speeches in a public setting. The course emphasizes research, delivery, and basic analysis and evaluation of students' own and others' speeches.
(Pre-requisites: None)

ENGL 205 Business Communication (3 credits)
ENGL 205 is designed to develop the English language skills needed to perform effectively in the current global marketplace. The course builds confidence in communicating orally and in writing in various business contexts, explains essential business vocabulary, and teaches the 21st Century skills essential for success in today's workplace. *Pre-requisites: None*

ENGR 100 Introduction to Engineering (1 credit)
This course is designed to introduce students to explore the professional responsibilities and challenges faced by engineers, designers, and professionals. Students explore the emerging issues and approaches to sustainability and the complex nature of the design problems they will encounter in professional practice. Students engage in research and problem-solving task that addresses environmental and social sustainability imperatives and fosters fundamental research, design, and communication skills. Special emphasis is placed on lifelong learning, academic literacy, and professional skills, including information literacy, project management and teamwork that will equip students for subsequent academic and professional contexts. *Prerequisites: NA.*

ENGR 105 Programming for Engineers (2 credit)
The primary goal in this course is to equip students with the tools they need to be successful when faced with computer programming assignments as a practicing engineer. In the context of engineering applications, basic procedural programming concepts will be covered including input/output, branching, looping, functions, file input/output, data structures (arrays, strings, and structures), pointers, and memory management. Emphasis will be on programming style, debugging, top-down design and modular code. Specific topics are listed in the course syllabus. This course covers introductory programming and problem solving in MATLAB and Python *(Prerequisite:* COSC 101*)*

ENGR 201 Methods of Analysis (3 credits)
This course involves selected analytical and numerical methods for solving problems from various engineering fields: Solution of initial and boundary value problems, series solutions, Laplace transforms, and nonlinear equations; numerical methods for solving ordinary differential equations, accuracy of numerical methods, linear stability theory, and finite differences. This course also introduces a programming basic tool for computation problems with engineering applications. *Prerequisite: MATH 152*

ENGR 202 Engineering Mathematics (3 credit)

This course involves selected topics—from ordinary differential equations, the Laplace transform, Fourier series, and Linear Algebra—with engineering applications using mathematical software. *(Prerequisite: MATH 154)*

ENGR 205: Multidisciplinary Research Methods (2 credits)
This course provides an interdisciplinary approach to research methods used in various engineering fields. The course covers quantitative, qualitative, and mixed methods approaches, and their application in engineering research. It also introduces students to ethical considerations and data analysis techniques specific to engineering research.
(*Prerequisite****:*** *ENGL 102****)***

ENGR 342 Engineering Economics Analysis (3 credit)
The systematic evaluation of the economic benefits and costs of projects involving engineering design and analysis. Economic decision-making in an environment of limited resources and uncertainty. Present economy, the economy of multi-year projects, selection among competing and independent alternatives, sensitivity of outcomes to input parameters, before- and after-tax analyses, replacement economy, inflation, and breakeven analysis in production environments. Application to examples and cases involving various engineering disciplines, i.e., mechanical engineering, civil engineering, etc. (*Prerequisites: MATH 154).*

ENGR 401: Entrepreneurship for Engineers (2 credits)
This course provides students with the knowledge and skills required to start and manage their own technology-based ventures. The course covers topics such as ideation, business model development, market research, intellectual property, and funding. The course is designed to provide students with an understanding of the entrepreneurial process and to develop their skills in identifying, evaluating, and pursuing entrepreneurial opportunities.
(Prerequisite: ENGR 205)

ENGM 411 Foundation in Research Methods (0 credit)
This course focuses on providing students with the foundational knowledge and skills necessary to conduct research in engineering management. The course covers the essential elements of research design, methodology, and data analysis, as well as the ethical considerations involved in conducting research. The course will also introduce students to the various research techniques and tools commonly used in engineering management research.

ENGM 535: Analytics for Engineering Managers (3 credits)
This course focuses on the application of data analytics and statistical methods in engineering management. The course is designed to provide students with the knowledge and skills necessary to analyze data and make informed decisions using various analytical tools and techniques. The course will cover topics such as descriptive and inferential statistics, data visualization, data mining, machine learning, and optimization techniques.

ENGM 528: Engineering and Sustainable Development (3 credits)

The course focuses on the intersection of engineering and sustainable development. The course is designed to provide students with a holistic understanding of sustainable development and its applications in engineering. The course will cover topics such as sustainability principles, life cycle assessment, green engineering, and sustainable design.

FINC 201 Financial Management (3 credits)
This course introduces the foundational knowledge in finance so that students can build skills and critically think about financial decisions made on a daily basis. The course begins with basic concepts, focusing on the economic environment (including financial markets, risk, the valuation process, and then shows how specific techniques and decision rules can be used to help maximize the value of the firm. *Prerequisites: ACCT 201*

FINC 221 Banking (3 credits)
This course provides an overview of the functions and services performed by banking and other financial institutions, as well as introduces the legal basis of the banker/customer relationship and facilitates awareness of the scale of competition within the financial services market. *Pre-requisites: FINC 201*

FINC 231 Managerial Finance (3 credits)
This course provides a comprehensive analysis of the structure of optimal decisions relative to the functional areas of corporate financial decision making. Emphasis is placed upon developing an understanding of applications and limitations of decision models, financing and dividend decisions of the corporation and leasing as a capital budgeting problem. *Prerequisite: FINC 201*

FINC 311 Corporate Finance (3 credits)
The aim of the course is to introduce students to the theory and application of why and how value enhancing corporate financial decisions are made and implemented. With the emphasis on publicly listed companies, topics covered include the corporate objective of management, investment evaluation models, project analysis and evaluation, sources and types of funding, issues in risk and return, asset pricing models, issues in capital structure and dividend policy and the efficiency of capital markets. The course is designed to ensure students with the necessary skill set for making value-changing financial decisions to maximize firm value *Prerequisite: FINC 231*

FINC 312 International Finance (3 credits)
Analysis of the international complexities of corporate financial management and investment strategies. Emphasis is placed on the nature of the close link between corporate financial management and developments in international financial institutions and international financial markets. *Prerequisite: FINC 231, ECON 202*

FINC 371 Financial Markets and Institutions (3 credits)
This course is designed to provide a broad introduction to the workings of financial markets and institutions. The chapter are selected to cover three main aspects of the course including: an overview of how financial markets work and the various types of markets and institutions, the Federal Reserve and interest rates, commercial banking and related institution, and various applications of the material covered. *Prerequisite: FINC 201*

FINC 410 Data Mining and Machine Learning (3 credits)

This course will enable students to gain critical knowledge and understanding of data mining and machine learning. Data mining and machine learning focuses on developing algorithms to automatically discover patterns and utilize models of large datasets. This course introduces students to the process and main techniques in data mining and machine learning. *Prerequisites: FINC 231*

FINC 411 Investments and Portfolio Management
A survey of investments including corporate and government securities, real property and financial intermediaries. Survey of investment theory emphasizing security analysis, valuation and portfolio management. **(**Prerequisite**:** FINC 231**)**

FINC 412 Data Driven Financial Analysis (3 credits)
This course is intended to give students the opportunity to widen and deepen their knowledge of financial theory and practice by explaining how financial models and techniques implemented. Students are expected to use Excel to model a number of common applications including the models used for valuation, construction of portfolios, estimation of risk measures, and performance measurement. By the end of the course students should have a critical understanding of finance concepts as well as an extended knowledge of the spreadsheet package. *Prerequisites: FINC 231*

FINC 414 Islamic Banking and Finance (3 credits)
The goal of this course is to provide students with an overview of Islamic financial institutions and how they vary from traditional ones. This course explains the foundations of the Islamic banking and economic systems as well as the ban on using riba in business transactions. It provides students with an introduction of the legal and regulatory framework in the Islamic finance business and exposes them to the main transactions in Islamic finance, such as murabaha, mudarabah, ijarah, and musharakah. It prepares its students to evaluate opportunities and problems in Islamic finance today with a critical eye **(**Prerequisite**:** ECON 202, FINC 221**)**

FINC 421 Alternative Investments (3 credits)
This course covers both theoretical and practical sides of managing alternative investments. The course provides a detailed analysis of various classes of alternative investments in the financial markets, in particular, real estate, hedge funds, commodities, and private capital. The purpose of the course is to give students a good understanding of the operation of these investments; the benefits and pitfalls associated with them; and strategies to integrate them into the context of portfolio management. ***(****Prerequisite: FINC 411****)***

FINC 451 Starting a New Business (3 credits)
Entrepreneurial ventures need capital to support their business models, grow market share and create shareholder value. This course explores the core considerations in addressing the financing needs and challenges to support the launch and growth of new ventures as well as growth considerations when starting a business and achieving new milestones. Major topics include investment analysis, capital structure and valuation. Financing options available to new ventures at various stages of development are examined in depth. The criteria used by investors, debt financiers and other players in the capital market are also considered. *Prerequisite: FINC 231*

FINC 461 Mergers and Acquisitions (3 credits)
This course provides an in-depth understanding of the fundamental principles and practices of mergers, acquisitions, takeovers, and corporate restructuring, with a particular emphasis on

valuation techniques. It aims to develop expertise in understanding the valuation processes essential for analysing and assessing the strategic rationale and financial implications of corporate consolidation activities. *(Prerequisite: FINC 311)*

FINC 480 Finance Internship (3 credits)
The purpose of the Internship subject is to provide students with opportunity to demonstrate the application of conceptual knowledge to the real world via industry placement in their selected field. This allows students to integrate their theoretical and conceptual knowledge with the skills and problem-solving techniques required in the workplace. Other outcomes include the acquisition of knowledge, research skills and the attitudes of business professionals, the ability to think independently, grow in originality, creativity, initiative, curiosity, enthusiasm, and resourcefulness, the ability to communicate ideas, an understanding of theory and procedures; knowledge of pertinent literature; and adeptness in the workplace. This subject provides a valuable transition between university and the workplace. *Prerequisites: Minimum of 90 credits, CGPA of 2.00, MRKG 101, MGMT 101, FINC 201*

FINC 499 Capstone Project (6 credits)
The capstone course is a method of summative evaluation in which the student is given an opportunity to demonstrate integrated knowledge and growth in the major. The course consequently builds on the knowledge gathered during years as a business student. It gives them the ability to work on an extended business project under the guidance of a supervisor while gathering very practical experience. Students will be required to work on a complex and real-life problem related to Business studies. In doing so, the Capstone makes the link between the academic discourse and the world thereafter. ***(****Prerequisite: BUSN 401, Minimum 90 credits****)***

FINC 536 Corporate Finance for a Global Environment (3 credits)
The course is designed to offer candidates rigorous learning experience that would allow them to thoroughly understand contemporary finance theories. It examines the fundamentals of finance with an increasing focus on applications relevant to corporate executives. Topics include time value of money, valuation of financial and real assets, relationships between risk and return, capital structure choice, and payout policy. As a result, the course's theme is the valuation process, which is emphasized throughout the topics. Moreover, in the globalization era, the course considers financial and investment decision-making withing the context of a global environment. *Prerequisites: None*

HIST 201: World History through Art & the Humanities (3 credits)
How are we going to study history and its transmission through art and culture? By attempting to discover the connection between different civilizations and the interplay of influence among them with the intention to find the common root of human expression. The course surveys world art and art history including the visual arts, sculpture, architecture from prehistoric times through WWII. Students will compare artistic styles, movements, artists, and theories of art history across cultures. *Prerequisites: none*

HRMT 302: Recruiting the Best Talent (3 credits)
This course provides an overview of the recruitment process and strategies by which organizations identify and hire the best talents. Students will develop specific skills and acquire the competencies needed to effectively assess and select the best candidate for the best job vacancy. *Prerequisites: MGMT302*

HRMT 304: Compensation, Benefits and HRIS Systems (3 credits)
Discover how compensation systems influence organizational productivity, equity, and competitiveness. Develop strategic and analytical business acumen skills by applying compensation principles to organizational objectives. Look at how corporations use HRIS systems for management, data, balance scorecard analyses, and payroll tracking to improve long-term performance. Get hands-on practice with tools and processes for developing job designs and descriptions, internal data systems, and pay surveys. *Prerequisites: FINC201, MGMT302*

HRMT 401: Labor Relations and Ethical Issues in HRM (3 credits)
Explore techniques for effectively dealing with labor relations, including team management, industrial relations, grievances, and conflict resolution. Identify legal and ethical issues surrounding the contemporary study of labor relations and learn how to analyze these considering both Bahraini and international labor laws. Topics in the course include business ethics, ethical management practices, ethical decision-making, dispute resolutions, and dealing with contemporary ethical dilemmas in the workforce. *Prerequisites: BUSN301, MGMT302, MGMT350*

HRMT 402: Training, Coaching, and Succession Planning (3 credits)
Research shows that Training and Development increases employees' job satisfaction and morale, which leads to more efficiency and better profits. Acquire techniques for successfully fulfilling employee training and development needs, incorporating training and learning theories. Gain an overview of the main concepts, strategies and methodologies of employee training and development. Examine the key concepts at each stage of the training process including needs analysis, delivery options and program evaluation. *Prerequisites: MGMT302*

HRMT 403: Relationship and Performance Management (3 credits)
How do you manage implementing career plans, writing performance improvement plans, or dealing with employee terminations or outplacements? Learn how the role of a performance and relationship manager is key to improving the skills and expertise of employees. Topics include managing performance systems, creating development plans, building succession plans, training and managing performance reporting platforms, dealing with legal compliances, and enhancing organizational and communication skills for all levels of a contemporary organization. *Prerequisites: MGMT302*

HRMT 480 Human Resources Internship (3 credits)
This course provides students with the opportunity to practice on the job at an actual Human Resources department of a business organization for a period of six to seven weeks, thereby transferring and developing industry-specific and business skills acquired from prior study. *Prerequisites: minimum of 90 credits and a CGPA of 2.00, MGMT 101, FINC 201, MRKG 101*

HRMT 499: Research Project: HR Practitioner Case Study (3 credits)
Case studies tell stories of real-life experiences and events that can influence decisions and practices. Develop an original case study analysis research project that identifies local and multi-national key problems or challenges related to a diverse HRM topic. Examine specific HR business case examples and use past course readings, outside research, resources, and tools to create best solutions. Also, reflect on knowledge and skills learned throughout the HRM program for the development of this real-world case study project. Analytical and communicational skills should be evident in this project.

Guidance will be given to prepare and present a case study research project in both written and presentation form. *Prerequisites: HRMT495, Minimum of 90 credits.*

HRMT 305: Role of an HR Practitioner and Leader (3 credits)
Exemplary HR leaders are known for being forward-thinking, strong communicators and collaborators, ethical, quick problem-solvers, innovative, and having strong conflict management and relationship skills. Learn the functions of HR practitioners and leaders, differences between generalist and specialist roles in small, midsize, and large corporations, and how they contribute to a company's success. Explore how organizational psychology theories and social sciences build the foundation for understanding human behavior, workplace productivity, and employee satisfaction. *Prerequisites: MGMT205, MGMT302*

HRMT 406: International HRM (3 credits)
Today, managing across borders is more common than not and requires effective communication, collaboration, and relationship management skills. Develop a critical understanding of human resources management's role in an international context. Topics covered include the recruitment and selection of expatriates, performance management, and reward systems in a multinational context. Case studies are explored for the better understanding of realistic problems in international HRM. Discover skillsets and talents needed to prepare future HR managers for the challenges of multiculturalism and global issues in the modern workplace*. Prerequisites: MGMT302*

HUM 101: Forms & Ideas in the Humanities (3 credits)
Introductory course provides instruction in the interdisciplinary analysis and interpretation of meaning in art, music and literature, and in the understanding of philosophical ideas in their own right and as they influence styles and themes in works of art. *Prerequisites: none*

MATH 098 Pre-algebra (0 credits)
This course introduces numbers and number systems, prime numbers, fractions, order of operations, rules of algebra, linear equations, graphs of straight lines, ratios, rates and proportions, direct and inverse variation, percentages, simple interest rates, areas, and volumes of simple geometric figures. *Pre-requisites: High School Math OR MATH 097*

MATH 099 Pre-calculus (0 credits)
This course introduces the rules of algebra, equations, inequalities, graphs, circles and lines, functions, transformations of functions, one-to-one and inverse functions, exponential functions, logarithmic functions, trigonometric functions and their identities, zeros of polynomials, complex numbers, the fundamental theorem of algebra, and systems of equations. *Pre-requisites:*
High School Math OR MATH 097

MATH 115 Introduction to Probability and Statistics (3 credits)
This course introduces the concepts of and need for statistics, collection, tabulations, graphical representation of statistical data, frequency distributions, measures of central tendency, measures of dispersion and skewness, Kurtosis, probability and probability distributions, the binomial, the Poisson, and the normal distributions, estimating means and confidence intervals, and correlation and regression. Prerequisites: MATH 098 or placement exam score

MATH 130 College Algebra (3 credits)

This course introduces sets, number systems, fractions, polynomials, rules of algebra and linear equations and inequalities in one variable. It also covers functions and graphs, with a focus on polynomial, exponential and logarithmic functions. Other topics include equations of a straight line, systems of equations, and applications to real life situations. *Pre-requisites: MATH 098 or placement exam.*

MATH 131 Finite Math with Calculus (3 credits)
This course introduces matrix algebra, inequalities and systems of linear inequalities, linear programming, and basics of differential and integral calculus. *Pre-requisites: MATH 130*

MATH 153 Calculus I (4 credits)
This course aims to enhance understanding of concepts and the development of problem-solving skills in the areas of single variable differential calculus and single variable integral calculus. Topics include limits, differentiation, curve sketching, optimization, and introductory integration. Functions studied range from simple algebraic and radical expressions to more sophisticated rational, logarithms, exponentials, and trigonometric functions. Prerequisites: MATH 099 or placement exam score

MATH 154 Calculus II (4 credits)
This course involves applications and techniques of integration, including substitution, by parts, trigonometric substitution, and by partial fractions. The course also introduces improper integrals, numerical integration, sequences and series, geometric series formula, criteria for convergence, power series, and Taylor expansion. Prerequisites: MATH 153

MATH 203 Discrete Mathematics (3 credits)
This course focuses on logic, methods of proof, set theory, number theory, equivalence and order relations, counting (combinations and permutations), and solving recurrence relations.
Prerequisite: MATH 151 or MATH 153

MATH 252 Calculus III (4 credits)
This course emphasizes on vector functions (continuity, derivatives, and integrals), parametric curves and surfaces, polar coordinates, as well as functions of several variables (including continuity and partial derivatives, gradient, directional derivatives). Topics also include the chain rule, double and triple integrals, iterated integrals, integration using polar, cylindrical, and spherical coordinates, change of variables, line and surface integrals (including surface area), curl and divergence, and the integral theorems of Green, Stokes, and Gauss. *Pre-requisites: MATH 152 or MATH 154*

MATH 254 Introduction to Linear Algebra (4 credits)
This course is a survey of systems of linear equations and matrices, Gauss elimination, matrices, matrix operations, inverses, elementary matrices, diagonal and triangular matrices, symmetric, skew symmetric matrices, determinants of square matrices, vectors in 2- and 3-dimensional space, norm, dot product, cross product, lines, planes, Euclidean vector spaces, linear mappings between Euclidean spaces, properties of linear mappings, general vector spaces, subspaces, linear independency, base and dimension, row, column and null spaces, rank and nullity, inner product, angle, orthogonality, Gramm-Schmidt process, change of basis, orthogonal matrices, eigenvalues, eigenvectors, matrix diagonalization, linear transformations, Kernel, range, isomorphism and inverse linear transformations. *Pre-requisites: MATH 151*

MATH 255 Introduction to Linear Algebra (3 credits)
This course focuses on systems of linear equations and matrices, Gauss elimination, matrices, determinants vectors in 2- and 3-dimensional space, norm, dot product, cross product, lines, planes, Euclidean vector spaces, general vector spaces, and matrix diagonalization. Prerequisites: MATH 153

MATH 260 Probability and Statistics (4 credits)
This course is an introduction to probability and statistics. It emphasizes on operations of sets, counting problems, definition of probability, conditional probability, Bayes' theorem, one- and two-dimensional random variables, mathematical expectation and variance, basic discrete and continuous probability distributions, moment generating functions, law of large numbers, and central limit theorem. It also includes aspects of descriptive statistics, statistical intervals, hypothesis testing and simple linear regression and correlation. *Pre-requisites: MATH 152 OR MATH 154*

MECH 101 Solid Modeling I (3 credits)
The course is designed to teach the student sketching and visualization skills that will be used throughout their academic years and their professional career. Students will be introduced to different tools used in engineering drafting and will learn to draw of views in orthographic projection using first and third angle projections, as well as isometric drawings. Linework: Visible, Hidden, Centre Axis, Dimension and Section Lines. Dimensioning Principles: Appropriate dimensions in engineering drawings. Sections and Sectional Views: Include appropriate sectional views in engineering drawings. Then students are introduced to SolidWorks, a CAD program predominately used in the mechanical and aerospace industry. Students will learn the basic steps in a CAD environment, Dimensioning,2D & 3D creating and design. Students will have an introduction to assembly. *Pre-requisites: MATH 153*

MECH 204 Thermofluids
An introduction to engineering thermodynamics dealing with the application of the first and second laws of thermodynamics to the thermodynamic design and performance analysis of a typical thermo-mechanical plant using condensable vapors and gases as the working fluid. Basic fluid mechanics including: kinematics and dynamics of fluid flows; conservation laws applied to fluid flow; Euler, Bernoulli, Navier-Stokes equations; dimensional analysis; differential and integral flow analysis; flow visualization. (Prerequisite: PHYS 101)

MECH 204L Thermofluids Lab
The Thermofluids laboratory aims to provide students with hands on experience about Thermofluids field by setting up experiment, learn data acquisition theory, instrumentation, sensors, statistical and uncertainty analysis. The concepts of designing, performing and reporting experiments on thermal systems. Students will also learn technical report writing and work in teams. (Concurrent MECH 204)

MECH 210 Materials Science (3 credits)
This course will enable students to get the fundamental knowledge about materials structure and their mechanical properties in order to select the appropriate materials for engineering applications and design. The course will also provide basic understanding on various modes of materials strengthening and failure. It will cover various types of materials namely metals, polymers and composites. *Prerequisite: CHEM 101*

MECH 220 Engineering Mechanics - Dynamics (3 credits)

The purpose of the course is to present the foundations and applications of the relationship between forces acting on an object and its motion. This knowledge is essential for the detailed study of further courses such that fluid dynamics, flight dynamics and structural dynamics. The course is also designed to emphasize the critical importance of good problem-solving skills. ***(****Prerequisite: CIVL 200****)***

MECH 241 Engineering Materials (3 credits)
This course will enable students to get the fundamental knowledge about materials structure and their mechanical properties in order to select the appropriate materials for engineering applications and design. The course will also provide basic understanding on various modes of materials strengthening and failure. It will cover various types of materials namely metals, polymers and composites. ***(****Prerequisite: CHEM 101, CIVL 200****)***

MECH 241L Engineering Materials Lab (1 credit)
This course introduces students to experimental methods used to characterize engineering materials and mechanical behavior. Topics/experiments Included: experiments in mechanical properties, heat treatment, metallography, corrosion properties and X-ray diffraction. (Co-requisite: MECH 241)

MECH 310: Introduction to Engineering Design (3 credits)
This course introduces a professional approach to engineering design problems. The course content focuses on problem definition, information gathering, feasibility studies, analysis, final design and communication. Several design studies and projects are also introduced. The course requires filing an approved master plan with the department chair. *Prerequisites: MECH 302*

MECH 313: Numerical Analysis of Engineering Systems (3 credits)
This course introduces students to the concepts of modeling, simulation, and analysis of various mechanical systems, including dynamic, vibrational, electromechanical, and circuits for monitoring and controlling mechanical systems. Topics covered include an introduction to MATLAB, nonlinear algebraic equations, linear algebraic systems of equations, eigenvalue problems, regression and curve fitting, numerical differentiation and integration and ordinary differential equations. *(Prerequisite: MECH 220, ENGR 105)*

MECH 314 Engineering Design: Mechanical Components (3 credits)
This course involves the application of mechanics, physical properties of materials and solid mechanics to the design of machine elements. *Prerequisites: CIVL 302*

MECH 341: Manufacturing Processes (3 credits)
This course provides students with a comprehensive overview of the fundamental principles, techniques, and technologies utilized in modern manufacturing processes. This program emphasizes manufacturing concepts like Workshop safety, materials behavior under a range of design conditions, material selection techniques and shaping techniques so that graduates are equipped to design, control and innovate within this sector. The purpose of this course is to introduce students to various manufacturing processes and their underlying principles; develop understanding between material properties and manufacturing method selection; foster innovation while encouraging exploration of emerging technologies within manufacturing; as well as foster an innovative culture and investigate emerging technologies in manufacturing. *(Prerequisite: MECH 241)*

MECH 350: Thermodynamics (3 credits)

This course will provide undergraduate students with a comprehensive overview of the major areas of thermodynamics. Main thermodynamics concepts covered in this course range from the laws of Thermodynamics, concepts of energy, work, temperature, spontaneous and Irreversible heat processes, refrigerators, heat pumps, mass, and energy analysis of controlled volumes and closed systems and entropy. *Prerequisites: MATH 252*

MECH 451 Fluid Mechanics (3 credits)
Starting with an overview of fluid mechanics applications, then the fundamental fluids and flows properties are introduced. Fluid statics including pressure measurement devices are discussed. The Eulerian and Lagrangian approaches are presented along with some real-life applications. Integral formulation of fluid flow equations is discussed. Venturi meter and orifice meter are discussed as an application to the Bernoulli equation. Dimensional analysis and similitude are presented. Finally, viscous flow in pipes and ducts along with pressure losses are presented. Laminar and turbulent flows are introduced. *Prerequisite:* MATH 252

MECH 451L: Fluid Mechanics Laboratory (1 credit)
Introduction to fluid mechanics laboratory and design of experiments, including experiments on, Bernoulli's Theorem, Minor Losses, Specific Gravity, Impact of Jet, Reynolds' Number and Series and Parallel Pump. Students will also learn technical report writing and work in teams Prerequisite: PHYS 102

MECH 406 Mechanical Engineering Internship (6 credit)
This is a supervised internship course that provides mechanical engineering students with the opportunity to gain practical, hands-on experience in a professional work environment. The internship allows students to apply and further develop their knowledge and skills acquired throughout their academic studies. Under the guidance of industry professionals and academic supervisors, students engage in real-world projects, tasks, and responsibilities relevant to the field of mechanical engineering. (Prerequisite: Senior level (90 Credits), CGPA 2.0.)

MECH 410 Heating, Ventilating and Air-Conditioning (3 credits)
This course presents the fundamentals of air conditioning processes, psychometrics and building cooling-load calculations. Topics covered also include design and analysis of HVAC systems, equipment selection, design codes and standards and computerized cooling-load calculations. *Prerequisites: MECH 350 and MECH 453*

MECH 430: Industrial Management (3 credits)
This course introduces the different levels of management, productivity, and the importance of quality circle. Topics included: modern production management system, Lean manufacturing, and Total quality management (TQM), total productive maintenance (TPM), Human Resources and Management, and Industrial Relations and Legislations. **(**Prerequisites: MATH 252.)

MECH 440 Computer-Aided Manufacturing (3 Credits)
This course introduces students to the concepts of computer-controlled manufacturing and assembly techniques and devices, databases, and special languages, as well as agile manufacturing software programs and technologies. Prerequisites: MECH 310 AND MECH 341

MECH 453: Heat Transfer (3 credits)
This course focuses on the analytical and numerical solutions of steady and transient one and two-dimensional conduction problems, forced and natural convection in external and internal flows, as well as thermal radiation. (Prerequisites: MECH 451)

MECH 454: Renewable Energy and Sustainable Technology (3 credits)
This course covers Focuses on the practical application of renewable energy technologies. Topics included: energy and resource conservation and project siting, economics, financing, renewable energy and tax credits, technical and engineering aspects, regulatory issues, energy storage, monitoring and verification. Students study the advantages, limitations, and potential of various energy sources. Wind, solar, small-scale hydro, ground-source heat pumps, combined heat and power, biofuels, fuel cells, and other technologies are examined. Students will learn the strategies and cost/benefit analyses employed by energy analysts to meet demand with clean energy production. Discussions of economics, environment, politics and social policy are integral components of the course. Students will also complete their own study and proposal for a renewable energy project. (Prerequisites MECH 453)

MECH 457: Mechanical Vibrations (3 credits)
This course analyzes the concept of mechanical vibration. Topics covered also include single- and multi-degree freedom systems, free and forced vibrations, vibration isolation, vibration absorbers and theory of vibration measuring instruments. (Prerequisite MECH 220, and CIVL 302)

MECH 458: Automatic Control Systems (2 credits)
The course introduces students to the dynamic characteristics of control components and systems. Stability and response of closed-loop systems and design of control systems are also covered. (Prerequisite: MECH 313, and MATH 252)

MECH 458L: Automatic Control Systems Laboratory (1 credit)
This course introduces students to control theory (e.g., block diagrams, signal flow, stability, feedback, PID control) with applications in control of dynamic, vibrational and mechatronic systems. Analysis of system's time-domain and frequency-domain tools and performance assessment is to be carried out. Lead and lag compensator design according to the requirements of the plant will be implemented. Proportional, integral, and derivative control for motor speed and position control will be introduced to the students. Appling Control Systems knowledge to simulate and plot various characteristics of a system using MATLAB and/or SIMULINK are also discussed. (Co-requisite: MECH 458)

MECH 460: Computational Fluid Dynamics (3 credits)
This course covers the fundamentals of numerical algorithms for modeling dynamics of fluid flow computationally. Includes various approaches to discretize time and space on structured and unstructured grids with a variety of boundary conditions. Involves programming of basic CFD codes in MATLAB or Python to test example problems in fluid mechanics with different discretization schemes. Solution techniques for system of algebraic equations; Grid generation techniques; Solution techniques for Navier-Stokes equation; Finite element method for heat transfer and fluid flow problems; Turbulence modeling. Uses software to investigate more complex geometries and numerical approaches. Introduction to simulation of multiphase flow. (*Prerequisites* MECH 451.)

MECH 470: Machinery Fault Diagnosis and Signal Processing (3 credits)
This course introduces signal processing techniques and their applications to mechanical systems. There will be demonstration of real time machinery health monitoring by various condition monitoring aspects. Specific topics will cover signal properties, time and frequency domain signal analysis, digital filtering, input/output relationships between signals, vibration and measurement, and applications to machinery fault detection in bearings, gears, and shafts. MATLAB will be used in programming. (*Prerequisites: MATH 252.*)

MECH 490L Mechanical and Thermal Systems Laboratory (1 credit)
This course introduces students to data acquisition theory, instrumentation, sensors, data reduction, statistical and uncertainty analysis, and experiment design. The concepts of designing, performing and reporting experiments on mechanical and thermal systems, mechanisms, vibrations, structures, thermodynamics, and heat transfer are also introduced. *Prerequisites: MECH 350 and MECH 453*

MECH 496: Advanced Machine Design (3 credits)
This course focuses on the application of advanced mechanics of materials to the design and analysis of mechanical elements. Topics covered in the course also include probabilistic design and finite element methods as well as applications. Applications to the design of typical machine elements such as gears, linkages, and Cams. Design projects involve extensive use of finite element programs. *(Prerequisite: MECH 314 and MECH 341)*

MECH 498: Thermal System Analysis and Design (3 credits)
The primary goal of this course is to equip students with practical knowledge and skills related to thermal-fluid applications. The course is designed to offer students hands-on experience in designing thermal-fluid systems by tackling real-world design challenges. Additionally, the course aims to connect fundamental theories with practical engineering applications in the thermal-fluid field. (Prerequisite: MECH 350 and MECH 453)

MECH 499A: Engineering Design: Capstone Project I (2 credits)
This course serves as the first part of a two-semester sequence. It provides students with the opportunity to apply their accumulated knowledge and skills in Mechanical engineering to a substantial, real-world project. Emphasizing teamwork, project management, and interdisciplinary collaboration, this course lays the foundation for the completion of a comprehensive engineering design project in the subsequent semester. *(Prerequisite: Senior level (90 credits), CGPA 2.0)* This course serves as the first part of a two-semester sequence. It provides students with the opportunity to apply their accumulated knowledge and skills in mechanical engineering to a substantial, real-world project. Emphasizing teamwork, project management, and interdisciplinary collaboration, this course lays the foundation for the completion of a comprehensive engineering design project in the subsequent semester. Prerequisite (Senior Level (90 credits), CGPA 2.0)

MECH 499B: Engineering Design: Capstone Project II (2 credits)
Building upon the foundation established in Capstone Project I, this course focuses on the implementation, testing, and refinement of the engineering design developed in the earlier phase. Working in teams, students will apply their technical knowledge and skills to design, build, and evaluate a solution to the identified problem or opportunity. They will follow a systematic approach to prototype development, perform rigorous testing, and iterate on the design based on feedback

and evaluation results. Throughout the course, students will engage in critical analysis, problem-solving, and effective project management to address any challenges that arise during the implementation phase. Successful completion of this course will culminate in a fully functional and validated engineering solution, along with comprehensive documentation and a final presentation. *(Prerequisite: MECH 499A)*

MECH 496 Advanced Machine Design (3 credits)

This course focuses on the application of advanced mechanics of materials to the design and analysis of mechanical elements. Topics covered in the course also include probabilistic design and finite element methods as well as applications. Applications to the design of typical machine elements such as gears, linkages, and Cams. Design projects involve extensive use of finite element programs. *(Prerequisite: MECH 314 and MECH 341)*

MECH 498 Thermal System Analysis and Design (3 credits)

The primary goal of this course is to equip students with practical knowledge and skills related to thermal-fluid applications. The course is designed to offer students hands-on experience in designing thermal-fluid systems by tackling real-world design challenges. Additionally, the course aims to connect fundamental theories with practical engineering applications in the thermal-fluid field. (Prerequisite: MECH 350 and MECH 453)

MGMT 101 Principles of Management (3 credits)

This course explores the basic managerial functions of planning, organizing, leading, motivating, and controlling the contemporary environment. This course will provide students with the basic concepts and principles of management and show the application of these concepts and principles to managerial roles and activities for efficiency and effectiveness in the workplace. This course will also help in developing students' critical thinking abilities and problem-solving skills reflected in managerial real-life scenarios. Moreover, focusing on their communication skills promotes teamwork which is essential in today's managerial environment. ***(****Prerequisite: None****)***

Pre-requisites: None

MGMT 205 Organizational Behavior (3 credits)

Organizational Behavior explores core theories and their practical application in real-world organizational contexts. Students gain the ability to interpret and analyze organizational dynamics through OB theories, implement a sophisticated understanding of behavioral science in practical scenarios, and evaluate contemporary OB issues. The course equips students to demonstrate effective leadership, guiding individuals and teams in the dynamic and diverse landscape of organizational settings. *Prerequisite: MGMT 101*

MGMT 411 Operations Management (3 credits)

This course examines issues included in productions and operations management, design, operation and control of industrial enterprises, plant location, scheduling quality control, layouts, facilities, planning, material processing and inventory control. ***(****Prerequisite: MGMT 101, MATH 115, Minimum of 60 Credits****)***

MGMT 302 Managing Human Resources (3 Credits)

This course provides an overview of the processes by which organizations acquire, deploy, and retain their workforce. Students will develop specific knowledge, skills, and abilities needed to effectively carry out staffing activities, including HR planning, recruiting, selecting, placing, onboarding, training, and developing employees, labor relations, workplace safety, and compensation. Emphasis will be placed on the practical application of relevant theory, related research, and legal constraints as well as developing and applying critical thinking skills. Students will also develop skills in planning their career path. *Prerequisites: MGMT 101*

MGMT 413 Management and Leadership Development (3 Credits)
This course introduces students to the major concepts of the behavioral sciences that apply to the management of organizations. The course focuses on understanding factors and developing skills that affect the behavior and ultimately the performance of individuals and groups within organizations. Course activities are structured to provide students with opportunities for skill development through application, practice and reflection. *Prerequisite: MGMT 101*

MGMT 305 International Business (3 Credits)
This course reviews the principles, tools, processes, and practices used by managers to understand international markets, cultures, economies and political environments and to achieve competitive advantage in an international setting. Topics covered include globalization, country differences (political, economic, legal, and cultural), global trade and investment, global monetary systems, strategy and structure of international businesses, and international business operations and practices. *Prerequisite: MGMT 205, ECON 102*

MGMT 306 Cross-Cultural Management (3 Credits)
This course introduces students to culture as an important variable in international management and examines its impact on organizations, strategy, negotiations, management of human capital, leadership, team building, and ethics. The course content includes a metaphor approach to explore key differences among cultures and examine their relevance for international management practice. *Prerequisites: MGMT 305*

MGMT 310 Managing Family Business (3 Credits)
The purpose of this course is to familiarize students with key topics in family business management, such as family firm goals, conflict management, human resources, strategy, financial management, family and business governance, and succession planning. A wide variety of cases and examples are used throughout the course to highlight cultural and institutional differences between family businesses in contrasting contexts. ***(****Prerequisite: MGMT 101****)***

MGMT 412 Negotiation and Conflict Management (3 Credits)
This course explores conflict as a management issue in business organizations and also investigates techniques and methods for reaching effective agreements. The course employs case studies, role playing and other experiential learning tools to develop analytical problem-solving abilities and enhance conflict resolution skills. ***(****Prerequisite: MGMT 101, Minimum 60 Credits****)***

MGMT 313 Managing Change and Innovation (3 credits)
This course explores the importance of innovation to business success and considers current trends in technology, society, consumer expectations and the workforce. The course includes examination

of strategies for enabling innovation and overcoming obstacles to change. The course content also presents the concept of a learning organization in the context of transformational leadership. *Prerequisites: MGMT 205*

MGMT 414 Management Intervention and Consultation (3 credits)
This course is designed to initially overview the consulting profession with a subsequent emphasis on organization consulting issues. Effort will be placed on developing proficiencies in various skills required to practice consulting. The overall objective of this course is to help students develop a basic understanding of consultation skills and knowledge. *(Prerequisite: MGMT 411)*

MGMT 350 Business Ethics (3 credits)
This course introduces the ethical dimensions of business as related to the various stakeholders inside and outside the organization. Topics include business ethical theory, ethical decision making, typical dilemmas, and corporate social responsibility. *Corequisite ENGL 205/ Prerequisite: MGMT 205*

MGMT 430 Project Management (3 Credits)
This course explores the concepts and techniques of managing projects in service and manufacturing settings. Course content includes the following topics: project selection and evaluation; dynamics, motivation, and evaluation of team members; scheduling, budgeting, and closure. ***(****Prerequisite:* *FINC 201, ACCT 202, ENGL 205, Minimum of 70 Credits)*

MGMT 403 Entrepreneurship (3 Credits)
The course introduces the fundamentals of starting the entrepreneurship journey as a career and as a business, backed up by empirical guidance and solid theoretical research in the field. Learners will be able to harness different tools and resources and would build the right attitude on how to start a new business venture that is relevant and can be competitive in the marketplace. *Prerequisites: MGMT 101, Minimum 70 credits*

MGMT 403 Entrepreneurship (3 credits) for MA in Multimedia Management
In the US, there are 30.2 million small businesses, and more than half a million new businesses are started every month. Gain the knowledge and skills needed to successfully manage new ventures across the entrepreneurial life cycle. Prepare yourself for starting your own business or taking your existing business to the next level. Students will learn how to identify business opportunities by evaluating ideas and assessing market potential. They will gain a deep understanding of the risks and rewards associated with entrepreneurship. Students will have the knowledge and abilities to recognize and capitalize on entrepreneurial opportunities, setting a strong foundation for their future endeavors in the business world. *Prerequisite(s): None*

MGMT 410 Business Policy and Strategic Management (3 credits)
This course provides critical understanding of strategic management and business policies in modern organizations. This course is designed to develop problem-solving and decision-making skills in business situations that involve the organization as a whole and integrate knowledge and skills acquired from all areas of business. Prerequisites: Minimum 75 credits, MGMT 101

MGMT 480 Management Internship (3 credits)

The purpose of the Internship subject is to provide students with opportunity to demonstrate the application of conceptual knowledge to the real world via industry placement in their selected field. This allows students to integrate their theoretical and conceptual knowledge with the skills and problem-solving techniques required in the workplace. Other outcomes include the acquisition of knowledge, research skills and the attitudes of business professionals, the ability to think independently, grow in originality, creativity, initiative, curiosity, enthusiasm, and resourcefulness, the ability to communicate ideas, an understanding of theory and procedures; knowledge of pertinent literature; and adeptness in the workplace. This subject provides a valuable transition between university and the workplace. *Prerequisites: minimum of 90 credits and a CGPA of 2.00, Business senior standing, MGMT 101, FINC 201, MRKG 101*

MGMT 404 Technology Entrepreneurship (3 credits)
This course introduces the fundamentals for starting any business with some empirical guidance on how to use the tools and resources to start a new technology venture that is relevant and can be competitive in the marketplace. *Pre-requisites: None*

MGMT 499 Capstone Project (6 credits)
The capstone course is a method of summative evaluation in which the student is given an opportunity to demonstrate integrated knowledge and growth in the major. The course consequently builds on the knowledge gathered during years as a business student. It gives them the ability to work on an extended business project under the guidance of a supervisor while gathering very practical experience. Students will be required to work on a complex and real-life problem related to Business studies. In doing so, the Capstone makes the link between the academic discourse and the world thereafter. **(**Prerequisite**:** BUSN 401, Minimum 90 credits**)**

MGMT 513 Leadership Development and Team Building (3 credits)
Leadership is the process by which a person guides and influences others to engage in collective endeavors and achieve common goals. Students will articulate goal-oriented personal leadership vision and develop their personal leadership plan. Throughout the semester, students will work in teams and will be receiving and giving personal feedback from and to their peers. This feedback will be incorporated in their self-evaluation and their personal plan. A before and after assessment will take place at the last meeting and students will present their leadership plan to the class. Prerequisites: None

MGMT 520 Operations Management in Global Supply Chains (3 credits)
Operations management is the design, operation, and improvement of the systems that create and deliver goods and services. Students will demonstrate mastery level knowledge of concepts and tools in fundamental areas of operations management, including process design and analysis, quality management, inventory management, demand forecasting, sales and operations planning, material requirements planning, lean production, and supply chain management. Students will also develop the ability to perform both quantitative and qualitative analysis of problems and issues in operations management as well as to analyze the ethical consequences of their decisions. Prerequisites: None

MGMT 530 People Analytics for Leaders (3 credits)
The people analytics movement has contributed important insights to help managers become more effective at leading people and making better human-resources (HR) decisions. This course is designed to introduce these insights and the use of data to improve the practice of managing people

within organizations. All practices and approaches learned in this course are backed up by robust empirical evidence that has demonstrated their effectiveness. Ethical considerations relating to the use of data about the organization's workforce will be discussed. Additionally, the course will examine important regional and international legal aspects pertaining to existing work laws and their implications. The course will utilize a variety of methods including lectures, case analyses, class discussions, and hands-on exploration of a variety of data sets. Prerequisites: None

MGMT 532 Global Strategic Management and Innovation (3 credits)
The MBA Global Strategic Management and Innovation course provides students the opportunity to critical evaluate concepts related to global strategy and innovation and their importance for firms to succeed specially in dynamic business environments. A unique feature of this course is the corporation of a cutting-edge global strategy simulation game, allowing students to apply theoretical knowledge in a practical, risk-free, virtual environment. The curriculum covers diverse aspects such as cross-cultural management, strategic design options, disruptive innovation, and technology clusters. Assessments methods include, participation, in class quizzes, a team project report based on the simulation game, an online discussion question, and a final exam based on innovation. (Prerequisite: None) Prerequisites: None

MRKG 101 Principles of Marketing (3 credits)
This is an introductory course in marketing. It examines the role of marketing within the organization and in society. Key marketing concepts include consumer needs, market research, pricing and promotion. *Pre-requisites: None*

MRKG 201 Consumer Behavior (3 credits)
This course will help students understand how consumer behavior is central to the planning, development and implementation of marketing strategies. In addition to discussing classic consumer behavior concepts such as personality, perception, learning and attitude, this course will shed light on contemporary trends and issues including the role of new media, technological advances, and recent ethical concerns affecting the marketing industry. *Prerequisites: MRKG 101*

MRKG 202 Online Marketing Channels (3 credits)
This course is designed to provide students with a thorough understanding of how different digital channels (including: social media marketing, search engine optimization (SEO), paid-search, email marketing, website optimization, and mobile marketing, among others) operate, in tandem, as a part of an overarching online marketing strategy. The students will also learn how digital marketing theory and research can be utilized to achieve marketing goals in the online sphere. *Prerequisites: None*

MRKG 401 Principles of Marketing Research (3 credits)
The purpose of this course is to familiarize students with the key challenges facing marketing researchers in a modern world. The course will introduce students to the transactional stages of marketing research, including problem definition, research design development, data collection and analysis, and communication of research findings. It will further teach students to apply research findings to current marketing challenges. *Prerequisites: Minimum 70 credits, MATH 115*

MRKG 302 Marketing Strategy and Planning in a Digital World (3 credits)
The purpose of this course is to familiarize students with the process of developing and implementing a marketing strategy in a digital world. The course focuses on competitive positioning at the heart of

marketing strategy and offers in-depth emphasis on the processes used in marketing to achieve competitive advantage. The course pays special attention to the role of digital marketing tools in informing digital marketing strategy and planning. *Prerequisites: MRKG 101, MRKG 202, Minimum 60 credits*

MRKG 310 Integrated Marketing Communications in a Digital World (3 credits)
The purpose of this course is to familiarize students with an evolved definition of integrated marketing communications (IMC) and teach them how to effectively communicate in the business world. It will help students understand the importance of weaving together all marketing activities into one clear message and voice and how communications are produced and transmitted in a digital world. The subject additionally explores advertising and promotions, and the roles of social media, and other marketing tactics to effectively reach consumers. *Prerequisites: MRKG 101*

MRKG 410 Services Marketing (3 credits)
The purpose of this course is to enable students to acquire critical knowledge and understanding about the vital role that services play in the economy and its future and how services dominate the advanced economies of the world. This course will also cover implementing service strategies for competitive advantage across industries. ***(****Prerequisite: MRKG 201, Minimum of 60 Credits****)***

MRKG 421 Data Analytics and Visualization (3 credits)
The purpose of this course is to enable students to acquire critical knowledge and understanding of digital marketing analytics and its impact on marketing strategy and planning. Students will be able to critically analyze marketing data and use specialist tools to make informed marketing decisions. *Prerequisites: MRKG 101, MRKG 202, Minimum 60 credits*

MRKG 430 Project Management for Creative Industries (3 credits)
This course will give you the basic skills of project management with an emphasis on the creative industries (design, media etc.). You will acquire the technical tools to plan, estimate resources and pilot the progress of the project. Additionally, you will get a practical overview of the human aspects of project management. *Prerequisites: MGMT 101, Minimum 70 credits*

MRKG 480 Marketing Internship (3 credits)
The purpose of the Internship subject is to provide students with opportunity to demonstrate the application of conceptual knowledge to the real world via industry placement in their selected field. This allows students to integrate their theoretical and conceptual knowledge with the skills and problem-solving techniques required in the workplace. Other outcomes include the acquisition of knowledge, research skills and the attitudes of business professionals, the ability to think independently, grow in originality, creativity, initiative, curiosity, enthusiasm, and resourcefulness, the ability to communicate ideas, an understanding of theory and procedures; knowledge of pertinent literature; and adeptness in the workplace. This subject provides a valuable transition between university and the workplace. *Prerequisites: minimum of 90 credits and a CGPA of 2.00, Business senior standing, MGMT 101, FINC 201, MRKG 101*

MRKG 431 Contemporary Issues in Social Media Campaigns (6 credits)
The purpose of this course is to teach students about the latest developments in social media marketing research and practice. This will be achieved by presenting a balance of essential theory

and practical applications in the field of social media campaigns in the 21st century. *Prerequisites: MRKG 101, MRKG 202, Minimum 60 credits*

MRKG 499 Marketing and Social Media Project (3 credits)
This course is designed for final year digital marketing and social media students to further their digital marketing knowledge and skills. As they take this course, students will research and present solutions to a real-world digital marketing problem. This course encourages students to think analytically, logically, and creatively to integrate experience and knowledge in real world digital and social media marketing situations. *Prerequisites: MRKG401, Minimum 90 credits*

MRKG 515 Marketing Management & Strategy (3 credits)
This course explores a wide array of topics in marketing management and strategy, including elements of marketing strategy, planning, competition, and consumer behavior. Special emphasis is placed on developing students' analytical and creative understanding of the intricacies of marketing management in a business environment that is defined by vast advances in technology and increased attention to ethics and sustainability. *Prerequisites: None*

MSYS 201 Principles of Management Information Systems (3 credits)
An information system collects, stores, manages, and processes data to provide relevant and timely information for decision-making, operations, and business processes. This course equips students with a thorough understanding of MIS concepts and their significance in organizational contexts. Participants will learn to analyze and address the benefits and challenges of information technology within a business framework. Emphasis is placed on leveraging MIS principles to improve business processes through the application of reengineering principles and adept use of information technology. *Pre-requisites: None*

NDSE 301 Operations Research: Modeling (3 credits)
This course focuses on nonlinear and linear concepts, programming, optimization, and problem formulation in one variable, convexity, unconstrained, constrained optimization, as well as optimality conditions, direct search and gradient methods, computational complexity, and major heuristic approaches. Other areas include annealing, neural networks, tabu search, and genetic algorithms, duality and sensitivity analysis, transportation, trans-shipment and assignment problems and project management. ***(****Prerequisite:* MATH 154***)***

NDSE 302: Stochastic and Probability Modeling (4 credits)
This course is a continuation of the first course in Operations Research. The focus is on complementary concepts and methods of Markov Chains, Integer Linear Programming, Goal Programming, Probabilistic Models, Decision and Risk Analysis, Queuing Systems, and Simulation Modelling. (Prerequisite: NDSE 301 Operations Research Modeling, MATH 260 Probability and Statistics)

NDSE 306 Systems Simulation (3 credits)
This course introduces basic concepts of discrete-event simulation modeling and analysis. Topics include event-scheduling versus process-interaction approach, as well as random number and random variate generation, inverse transformation and other selected techniques, input data

analysis and goodness-of-fit tests, specific computer simulation languages, and analysis of simulation output and model validation. *Prerequisite: MATH 260*

NDSE 404: Design and Analysis of Experiments (3 credits)
This is an advanced course that focuses on the principles, methodologies, and optimization of systems through experimental design. The course emphasizes the practical utility of experimental design to enhance product and process design, development, and optimization. Students will learn how to use experimental design techniques to improve the quality, efficiency, and performance of working systems. The course takes a balanced approach to both designing experiments and analyzing the obtained data. ***(****Prerequisite:* *NDSE 301, ENGR 342, COSC 390****)***

NDSE 406 Industrial Engineering Internship (6 credits)
The is a supervised internship course that provides industrial engineering students with the opportunity to gain practical, hands-on experience in a professional work environment. The internship allows students to apply and further develop their knowledge and skills acquired throughout their academic studies. Under the guidance of industry professionals and academic supervisors, students engage in real-world projects, tasks, and responsibilities relevant to the field of industrial engineering. ***(****Prerequisite:* Senior level (90 Credits), CGPA 2.0***)***

NDSE 412 Facilities Design and Planning (3 credits)
This course is your gateway to understanding the intricate dance between functionality, aesthetics, and human well-being that breathes life into the buildings we inhabit. This course focuses on facilities design and planning in the intricate process of envisioning, creating, and managing the physical spaces where we work, learn, play, and live. It's a blend of art and science, weaving together functionality, aesthetics, and human well-being to craft environments that are not only efficient and productive, but also inspiring and comfortable. ***(****Prerequisite:* ENGR 100***)***

NDSE 415 Supply Chain Management (3 credits)
This course provides an overview of the fundamentals of supply chain management and enterprise resources planning (ERP). Topics also include aggregate production planning (static, dynamic, nonlinear, and lot sizing models), operations scheduling (flow shops and job shops), materials management and materials requirement planning (MRP), capacity resources planning (CRP), distribution system management, and implementation of manufacturing management strategies. *Prerequisite: NDSE 412*

NDSE 423 Quality Engineering (3 credits)
This course provides an overview of the principles of quality control systems, process control concepts, specification and tolerances, process capability studies, control charts, acceptance sampling plans, cost aspects of quality decisions, quality improvement programs, and quality information systems. *Prerequisite: MATH 260*

NDSE 481 Safety Engineering (3 credits)
This course focuses on human protection systems, emergency and accident handling, hazard identification techniques, safety vs reliability and systems safety quantification. ***(****Prerequisite:* ***ENGR*** 100***)***

NDSE 499A Engineering Design: Capstone Project I (2 credit)

To conduct an independent state of the art applied research project on a variety of topics in the field of industrial engineering, that involves formulating a real-world problem, developing its specifications, designing, and implementing it. The outcome of the project is expected to address the performance of the proposed solution, present the findings of the project, and finally write a report to highlight the process and the viability of the proposed solution. *(Prerequisite:* Senior level (90 Credits), CGPA 2.0*)*

NDSE 499B: Engineering Design: Capstone Project II (2 credit)
Building upon the foundation established in Capstone Project I, this course focuses on the implementation, testing, and refinement of the engineering design developed in the earlier phase. Working in teams, students will apply their technical knowledge and skills to design, build, and evaluate a solution to the identified problem or opportunity. They will follow a systematic approach to prototype development, perform rigorous testing, and iterate on the design based on feedback and evaluation results. Throughout the course, students will engage in critical analysis, problem-solving, and effective project management to address any challenges that arise during the implementation phase. Successful completion of this course will culminate in a fully functional and validated engineering solution, along with comprehensive documentation and a final presentation. ***(****Prerequisite:* NDSE 499A***)***

PHIL 101 Introduction to Philosophy (3 credits)
This course introduces students to central questions in philosophy through exploration of issues and concepts from selected renowned Western philosophers. It engages students in the close study of their own values and beliefs on themes such as the nature of reality, knowledge, the self, the good, and the right, and all in light of some of the greatest works in the Western philosophic enterprise, while considering their historical context and contribution to human thought and development. *(Pre-requisites: None)*

PHYS 101 Principles of Physics I (3 credits)
This course provides an overview of the fundamental principles of physics in areas of mechanics. Topics include standards and units, vectors and coordinate systems, kinematics, dynamics of single particles, work energy and power, conservation on energy, dynamics of system of particles, collisions, and rotational kinematics and dynamics. The course is designed for students requiring calculus-based physics. *Pre-requisites: MATH 151 or MATH 153*

PHYS 101L Principles of Physics I Laboratory (1 credit)
This course is designed to reinforce topics presented in PHYS 101 lectures. Through scientific experimentation, students will improve their understanding of basic concepts in mechanics while developing their foundation of the scientific process. Laboratory work includes the setting up and running of physics' experiments, whether hands on or online. Regular activities include data taking, data presentation, data visualization, data analysis, fitting, and drawing of conclusions. Pre-*Co-requisites: PHYS 101*

PHYS 102 Principles of Physics II (3 credits)
The course provides an overview of the fundamental principles of physics in the areas of electricity and magnetism. Topics include electric field, Gauss law, electric potential, capacitance and dielectrics, current and resistance, direct current circuits, magnetic fields, sources of magnetic fields,

Biot-Savart Law, Ampere's Law, Faraday's law, and Lenz's Law. The course is designed for students requiring calculus-based physics. *Prerequisites: PHYS 101 and either MATH 152 OR MATH 154*

PHYS 102L Principles of Physics II Laboratory (1 credit)
This course is designed to reinforce topics presented in PHYS 102 lectures. Through scientific experimentation, students will improve their understanding of basic concepts in electricity and magnetism while developing their foundation of the scientific process. Laboratory work includes the setting up and running of physics' experiments, whether hands on or online. Regular activities include data taking, data presentation, data visualization, data analysis, fitting, and drawing of conclusions. *Pre-Co-requisites: PHYS 102*

PHYS 103 Physics and the Visual Arts (4 credits)
Physics and the Visual Arts provides students in non-science or engineering disciplines a fundamental understanding of how physics relates to the visual arts. The focus of the course is optics and includes both light and radiations. The course is designed for students studying design or other programs where calculus is not required. *Pre-requisites: None*

PHYS 104 Physics of Sound and Acoustics (4 credits)
Physics of Sound and Acoustics provides students in non-science or engineering disciplines a fundamental understanding of the physics of sound and acoustics. The focus of the course is on the principles of musical and architectural acoustics, waves and vibrations, digital techniques for generating and recording sound, perception and measure of sound. The course is designed for students studying design or other programs where calculus is not required. *Pre-requisites: None*

PHYS 105 Principles of Physics III (3 credits)
This course provides an overview of the fundamental principles of physics in the areas of static equilibrium and elasticity, fluid mechanics, kinetic theory of gases, first and second law of thermodynamics, mechanical waves, vibrating bodies, and acoustic phenomena. Prerequisites: PHYS 101 and either MATH154

PHYS 105L Principles of Physics III Laboratory (1 credit)
PHYS 105L is designed to reinforce topics presented in PHYS 105 lectures. Through scientific experimentation, students will improve their understanding of basic concepts in static equilibrium and elasticity, fluid mechanics, kinetic theory of gases, first and second law of thermodynamics, mechanical waves, vibrating bodies, and acoustic phenomena while developing their foundation of the scientific process. Pre-*co-requisites: PHYS 105*

POLS 321 Comparative Political Ideologies (3 credits)
This course examines, compares, and contrasts a range of political ideologies and their interpretation and application in contemporary societies. Attention is paid to defining the role and function of ideologies in specific contemporary states. *Pre-requisites: None*

PSYC 101 Introduction to Psychology (3 credits)
Psychology is the scientific study of behavior and mental processes. The content focuses on the exploration of major theories and concepts, methods, and research findings in psychology. Topics include the biological bases of behavior, ethics involved in research, perception, cognition, learning, memory,

emotion, motivation, development, personality, social psychology, psychological disorders and therapeutic approaches, and applied psychology.. *Pre-requisites: None*

SOCS 101 Introduction to Sociology (3 credits)
This course will introduce students to the basic concepts and theories of sociology, as well as to the methods utilized in sociological research. The course will address how sociological concepts and theories can be utilized to analyze and interpret our social world, and how profoundly our society and the groups to which students belong influence them. *Pre-requisites: None*

SOCS 201 Introduction to Criminology (3 credits)
The course surveys various theories of crime, with an emphasis on understanding the social causes of criminal behavior. The techniques for measuring crime as a social phenomenon and the nature of crime are examined. This course addresses crime types (such as consensual or white-collar crimes), the criminal justice system, and other social responses to crime with a focus on cyber-crime. The course prepares students to be informed citizens in a global technological society. *Pre-requisites: None*

SUST 101 Principles of Sustainability (3 credits)
This introductory course uses an interdisciplinary approach to help students understand the main concepts of sustainability. Students will learn about sustainability as it relates to economic development, social equity, and current environmental challenges. Students will also develop the ability to apply sustainable thinking in their personal and professional lives. *Pre-requisites: None*

SWEN 360 Software Design and Engineering (3 credits)
This course provides students with an overview of Software Engineering, introducing theory and practical exercises with main focus on practical work in teams and individually. Concepts and techniques for systems engineering, requirements analysis, design, implementation and testing of computer systems. Principles of software engineering for production of reliable, maintainable and portable software products. Emphasis on object-oriented analysis and design techniques. This is a lecture portion of a course in software engineering involving the design and partial implementation of a software system as a group project. *(Prerequisite: COSC 125)*

SWEN 360L: Software Design and Engineering Laboratory (1 credit)
This laboratory-based course provides students with practical experience in applying software engineering principles and techniques to real-world scenarios. Students will work individually and in teams to engage in various software engineering activities, including requirements analysis, design, implementation, testing, and maintenance of software systems. Through a series of guided projects and exercises, students will develop skills in problem-solving, critical thinking, and effective collaboration within a software engineering context. This laboratory course serves as a valuable opportunity for students to gain practical insights into the application of software engineering concepts and refine their skills in building reliable and maintainable software products. *(Co-requisite: SWEN 360)*

UNSS 101 University Success (1 credit) – Degree Plans starting in Fall 2023 and onwards.
This course is designed to help students function as independent learners within a university environment. The course teaches students various transferable study skills, including time

management, dealing with group projects, test preparation, and critical reading. It also intends to raise students' understanding of themselves as learners. *Prerequisites: None*

COURSE DESCRIPTIONS ABBREVIATIONS

Disciplinary Acronyms for Course Description Purposes

ACCT	Accounting
ARHG	Arabic Heritage
ARCH	Architecture
BIOL	Biology
BUSN	Business
CHEM	Chemistry
CIVL	Civil Engineering
CMAD	College of Media and Design
CMPE	Computer Engineering
COSC	Computer Science
DSAI	Data Science and Artificial Intelligence
DSGN	Design
ECON	Economics
ELEC	Electrical Engineering
ENGL	English
ENGR	Engineering
ENVM	Environmental Science
FINC	Finance
MATH	Mathematics
MECH	Mechanical Engineering
MGMT	Management
MSYS	Management Information Systems
MRKG	Marketing
NDSE	Industrial Engineering
PHYS	Physics
PSYC	Psychology
SOSC	Sociology
SWEN	Software Engineering

Appendix

Bachelor of Arts in Multimedia Design
Curriculum plan

General Education Requirements (38 credits)

English Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ENGL 101	Composition I	3	0	3	
ENGL 102	Composition II	3	0	3	ENGL 101
ENGL 205	Business Communication in Its Rhetorical Contexts	3	0	3	

Arab Heritage Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 104/101	Arabic for Arabic Speakers/ Arabic for Non Arabic Speakers	3	0	3	
ARHG 102	Modern History of Bahrain	3	0	3	

Mathematics Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MATH 130	College Algebra	3	0	3	MATH098 or placement exam
MATH 131	Finite Math with Calculus	3	0	3	MATH 130

Science Requirements (8 credits)- Choose two courses

Examples of course subjects that are satisfy the Science Requirement include Biology, Chemistry, Geology, and Physics. Other courses may be considered if approved by the academic unit in advance.

Social Science Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 103	Human Rights	3	0	3	
PSYC 101	Introduction to Psychology	3	0	3	
SOCS 101	Introduction to Sociology	3	0	3	

Core Requirements (51 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
DSGN 101	Visual Culture I	3	0	3	
DSGN 102	Visual Culture II	3	0	3	DSGN 101
DSGN 111	Basic Design I	3	0	3	

DSGN 112	Basic Design II	3	0	3	DSGN 111, DSGN 141
DSGN 141	Computer Culture I	3	0	3	
DSGN 142	Computer Culture II	3	0	3	DSGN 141
DSGN 201	Typography	3	0	3	DSGN 141
DSGN 211	Photography Techniques	3	0	3	
DSGN 244	Digital Image Processing	3	0	3	DSGN 142
DSGN 261	Video Production I	3	0	3	
DSGN 321	Introduction to Multimedia	3	0	3	
DSGN 411	Physical Interaction Design	3	0	3	DSGN 341
DSGN 401	Capstone Project I	3	0	3	DSGN 332 Senior Level standing 90cr.
DSGN 402	Capstone Project II	6	0	6	DSGN 401
DSGN 405	Multimedia Design Internship	6	0	6	90 credits and a minimum CGPA of 2.00

Major Requirements (18 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
DSGN 232	Digital Vector Graphics	3	0	3	DSGN 141
DSGN 301	Web Design	3	0	3	
DSGN 302	Interactive Web Projects	3	0	3	DSGN 301
DSGN 331	Multimedia Design	3	0	3	DSGN 321
DSGN 332	Multimedia Production	3	0	3	DSGN 331
DSGN 341	3-D Computer Graphics	3	0	3	DSGN 142

Major Electives (9 Credits)

Students pursuing Bachelor of Fine Arts in Multimedia Design must complete a minimum of nine elective credits in design (DSGN) coursework offered at or above the 200-level and which are not considered courses within the major requirements. 9 credits must be earned in the area of art/design history, theory and criticism (as a part of common body of knowledge).

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
DSGN 212	Photography Workshop	3	0	3	DSGN 211
DSGN 210	Digital Storytelling	3	0	3	
DSGN 241	Concept Development	3	0	3	
DSGN 223	Sound and Image	3	0	3	
DSGN 262	Video Production II	3	0	3	DSGN 261
DSGN 319	Composition and Digital Effects	3	0	3	DSGN 142

Professional Elective Options (9 Credits)

Students pursuing a Bachelor of Arts in Multimedia Design must complete a minimum of 9 elective credits. Elective credits can be earned via any courses offered at or above the 100-level.

(Choose 3 courses) Each of the following courses bear 3 credit units:

- MRKG 101- Principles of Marketing
- MGMT 101- Principles of Management
- ACCT 101 Introduction to Financial Accounting
- BUSN 101 Introduction to Business
- CMPE 160 Introduction to programming & applications.

Total Number of units: 125

BBA in Digital Marketing and Social Media
Curriculum plan

General Education Requirements (38 credits)

English Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ENGL 101	Composition I	3	0	3	
ENGL 102	Composition II	3	0	3	ENGL 101
ENGL 205	Business Communication	3	0	3	

Arab Heritage Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 104/101	Arabic for Arabic Speakers/ Arabic for Non Arabic Speakers	3	0	3	
ARHG 102	Modern History of Bahrain	3	0	3	

Mathematics Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MATH 115	Business Statistics	3	0	3	

Choose one course:

MATH 130	College Algebra	3	0	3	
MATH 131	Finite Math with Calculus	3	0	3	MATH 130

Science Requirements (8 credits)- Choose two courses

Examples of course subjects that are satisfy the Science Requirement include Biology, Chemistry, Geology, and Physics. Other courses may be considered if approved by the academic unit in advance.

Social Science Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 103	Human Rights	3	0	3	
PSYC 101	Introduction to Psychology	3	0	3	
SOCS 101	Introduction to Sociology	3	0	3	

Business Core Requirements (39 Credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ACCT 101	Introduction to Financial Accounting	3	0	3	
ACCT 102	Introduction to Managerial Accounting	3	0	3	ACCT 101

BUSN 101	Introduction to Business	3	0	3	
BUSN 301	Business Law	3	0	3	60 credits
ECON 101	Principles of Microeconomics	3	0	3	
ECON 102	Principles of Macroeconomics	3	0	3	ECON 101
FINC 101	Essentials of Financial Analysis	3	0	3	
MGMT 101	Principles of Management	3	0	3	
MGMT 205	Organizational Behavior	3	0	3	MGMT 101
MGMT 350	Business Ethics	3	0	3	MGMT 205 Co req: ENGL 205
MGMT 410	Business Policy and Strategic Management	3	0	3	Minimum of 75 credits, MGMT 101
MRKG 101	Principles of Marketing	3	0	3	
MSYS 101	Principles of Management Information Systems	3	0	3	

Major Requirements (36 Credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
DSGN 141	Computer Culture I	3		3	
DSGN 412	Media Law and Ethics	3		3	BUSN 301
MRKG 421	Data Analytics and Visualization	3		3	Minimum 60 credits, MRKG 101, MRKG 202
MRKG 431	Contemporary Issues in Social Media Campaigns	3		3	Minimum 60 credits, MRKG 101, MRKG 202
MRKG 430	Project Management for Creative Industries	3		3	MGMT 101, Minimum 70 credits
MRKG 201	Consumer Behavior	3		3	MRKG 101
MRKG 202	Online Marketing Channels	3		3	
MRKG 401	Principles of Marketing Research	3		3	MATH 115, Minimum 70 credits
MRKG 302	Marketing Strategy and Planning in a Digital world	3		3	MRKG 101, MRKG 202, Minimum 60 credits
MRKG 480	Marketing Internship	3	0	3	Minimum 90 credits, CGPA of 2.00, MRKG 101, MGMT 101, FINC 101
MRKG 499	Marketing and Social Media Project	6		6	MRKG 401, CGPA of 2.00, Minimum of 90 credits

Major Electives (6 Credits)

Students pursuing a BBA in Digital Marketing and Social Media must complete a minimum of 6 elective credits of which 6 credits are either from the Design courses (DSGN) or 6 credits are from business courses offered at or above the 100 level and which are not considered courses within the Major Requirements

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MGMT 305	International Business	3	0	3	MGMT 205, ECON 102
MRKG 310	Integrated Marketing Communications in a Digital World	3	0	3	MRKG 101
MGMT 313	Managing Change and Innovation	3	0	3	MGMT 205
DSGN 301	Web Design	3	0	3	
MRKG 410	Services Marketing	3	0	3	MRKG 201, Minimum 60 credits
BUSN 410	Artificial Intelligence for Business	2	1	3	MATH 115 or MATH 153, ENGL 102 , COSC 101 , min 90 credits

Professional Elective Options (6 Credits)

Students pursuing a BBA in Digital Marketing and Social Media must complete a minimum of 6 Professional Elective credits. Professional Elective credits may be earned via any courses offered at or above the 200 level.

Total number of units: **125**

Bachelor of Business Administration in Finance
Curriculum plan

General Education Requirements (38 credits)

English Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ENGL 101	Composition I	3	0	3	
ENGL 102	Composition II	3	0	3	ENGL 101
ENGL 205	Business Communication	3	0	3	

Arab Heritage Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 104/101	Arabic for Arabic Speakers/ Arabic for Non Arabic Speakers	3	0	3	
ARHG 102	Modern History of Bahrain	3	0	3	

Mathematics Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MATH 115	Business Statistics	3	0	3	

Choose one course:

MATH 130	College Algebra	3	0	3	
MATH 131	Finite Math with Calculus	3	0	3	MATH 130

Science Requirements (8 credits)- Choose two courses

Examples of course subjects that are satisfy the Science Requirement include Biology, Chemistry, Geology, and Physics. Other courses may be considered if approved by the academic unit in advance.

Social Science Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 103	Human Rights	3	0	3	
PSYC 101	Introduction to Psychology	3	0	3	
SOCS 101	Introduction to Sociology	3	0	3	

Business Core Requirements (39 Credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ACCT 101	Introduction to Financial Accounting	3	0	3	
ACCT 102	Introduction to Managerial Accounting	3	0	3	ACCT 101
BUSN 101	Introduction to Business	3	0	3	
BUSN 301	Business Law	3	0	3	60 credits

ECON 101	Principles of Microeconomics	3	0	3	
ECON 102	Principles of Macroeconomics	3	0	3	ECON 101
FINC 101	Essentials of Financial Analysis	3	0	3	ACCT 101
MGMT 101	Principles of Management	3	0	3	
MGMT 205	Organizational Behavior	3	0	3	MGMT 101
MGMT 350	Business Ethics	3	0	3	MGMT 205 co-req ENGL 205
MGMT 410	Business Policy and Strategic Management	3	0	3	75 Credit units, MGMT 101,
MRKG 101	Principles of Marketing	3	0	3	
MSYS 101	Principles of Management Information Systems	3	0	3	

Major Requirements (30 Credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
FINC 111	Banking	3	0	3	
FINC 211	Financial Services	3	0	3	
FINC 231	Managerial Finance	3	0	3	FINC 101
FINC 311	Corporate Finance	3	0	3	FINC 231
FINC 312	International Finance	3	0	3	FINC 231, ECON 102
FINC 321	Investments	3	0	3	FINC 231
BUSN 401	Business Research Methods	3	0	3	MATH 115, Min 70 credits
BUSN 402	Case study, project or dissertation	6	0	6	BUSN 401, 90 credits
FINC 401	Internship	3	0	3	Minimum of 90 credits, CGPA of 2.00, MRKG 101, MGMT 101, FINC 101

Major Electives (9 Credits)- Choose three courses

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
FINC 331	Portfolio Management	3	0	3	FINC 321
FINC 341	Financial Analysis	3	0	3	FINC 231
FINC 351	Starting a New Business	3	0	3	FINC 231
FINC 361	Mergers and Acquisitions	3	0	3	FINC 311
FINC 371	Financial markets and Institutions	3	0	3	FINC 101
FINC 410	Data Mining and Machine Learning	3	0	3	FINC 231
FINC 412	Data Driven Financial Analysis	3	0	3	FINC 231
BUSN 410	Artificial Intelligence for Business	2	1	3	MATH 115 or MATH 153, ENGL 102 , COSC 101 , min 90 credits

Professional Elective Options (9 Credits)

Students pursuing a Bachelor of Business Administration in Finance must complete a minimum of 9 elective credits. Elective credits can be earned via any courses offered at or above the 200 level.

Total Number of units: **125**

Bachelor of Business Administration in Human Resource Management
Curriculum plan

General Education Requirements (38 credits)

English Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ENGL 101	Composition I	3	0	3	
ENGL 102	Composition II	3	0	3	ENGL 101
ENGL 205	Business Communication	3	0	3	

Arab Heritage Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 104/101	Arabic for Arabic Speakers/ Arabic for Non Arabic Speakers	3	0	3	
ARHG 102	Modern History of Bahrain	3	0	3	

Mathematics Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MATH 115	Business Statistics	3	0	3	

Choose one course:

MATH 130	College Algebra	3	0	3	
MATH 131	Finite Math with Calculus	3	0	3	MATH 130

Science Requirements (8 credits)- Choose two courses

Examples of course subjects that are satisfy the Science Requirement include Biology, Chemistry, Geology, and Physics. Other courses may be considered if approved by the academic unit in advance.

Social Science Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 103	Human Rights	3	0	3	
PSYC 101	Introduction to Psychology	3	0	3	
SOCS 101	Introduction to Sociology	3	0	3	

Business Core Requirements (39 Credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ACCT 101	Introduction to Financial Accounting	3	0	3	
ACCT 102	Introduction to Managerial Accounting	3	0	3	ACCT 101
BUSN 101	Introduction to Business	3	0	3	
BUSN 301	Business Law	3	0	3	60 credits

ECON 101	Principles of Microeconomics	3	0	3	
ECON 102	Principles of Macroeconomics	3	0	3	ECON 101
FINC 101	Essentials of Financial Analysis	3	0	3	ACCT 101
MGMT 101	Principles of Management	3	0	3	
MGMT 205	Organizational Behavior	3	0	3	MGMT 101
MGMT 350	Business Ethics	3	0	3	MGMT 205 Co req: ENGL 205
MGMT 410	Business Policy and Strategic Management	3	0	3	Minimum of 75 credits, MGMT 101
MRKG 101	Principles of Marketing	3	0	3	
MSYS 101	Principles of Management Information Systems	3	0	3	

Major Requirements (30 Credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MGMT 302	Managing Human Resources	3	0	3	MGMT 101
HRMT 302	Recruiting the Best Talent	3	0	3	MGMT101
HRMT 304	Compensation, Benefits and HRIS Systems	3	0	3	FINC101, MGMT 302
HRMT 401	Labor Relations and Ethical Issues in HRM	3	0	3	BUSN301, MGMT 302, MGMT 350
HRMT 402	Training, Coaching, and Succession Planning	3	0	3	MGMT 302
HRMT 403	Relationship and Performance Management	3	0	3	MGMT 302
HRMT 480	Human Resources Internship	3	0	3	Minimum of 90 credits, MGMT 101, MRKG 101, FINC 101, GPA of 2.00
HRMT 495	Research Influence on HRM Practice	3	0	3	MATH 115 Minimum of 70 credits, MATH 115
HRMT 499	Research Project: HR Practitioner Case Study	6	0	6	HRMT495, Minimum of 90 credits,

Major Electives (9 Credits)- Choose 3 courses:

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
HRMT 305	Role of an HR Practitioner and Leader	3	0	3	PSYC101, MGMT205, MGMT302
HRMT 406	International HRM	3	0	3	MGMT302
MGMT 301	Operations Management	3	0	3	MGMT 101, MATH 115

MGMT 306	Cross-Cultural Management	3	0	3	MGMT 205
MGMT 312	Negotiations and Conflict Management	3	0	3	MGMT 101
MGMT 313	Managing Change and Innovation	3	0	3	MGMT 205
BUSN 410	Artificial Intelligence for Business	2	1	3	MATH 115, ENGL 102, min 90 credits

Professional Elective Options (9 Credits)

Students pursuing a BBA in Human Resource Management must complete a minimum of 9 Professional Elective credits. Professional Elective credits may be earned via any courses offered at or above the 200 level.

Total number of units: **125**

Bachelor of Business Administration in Management
Curriculum plan

General Education Requirements (38 credits)

English Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ENGL 101	Composition I	3	0	3	
ENGL 102	Composition II	3	0	3	ENGL 101
ENGL 205	Business Communication	3	0	3	

Arab Heritage Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 104/101	Arabic for Arabic Speakers/ Arabic for Non Arabic Speakers	3	0	3	
ARHG 102	Modern History of Bahrain	3	0	3	

Mathematics Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MATH 115	Business Statistics	3	0	3	
MATH 130	College Algebra	3	0	3	

Science Requirements (8 credits)- Choose two courses

Examples of course subjects that are satisfy the Science Requirement include Biology, Chemistry, Geology, and Physics. Other courses may be considered if approved by the academic unit in advance.

Social Science Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 103	Human Rights	3	0	3	
PSYC 101	Introduction to Psychology	3	0	3	
SOCS 101	Introduction to Sociology	3	0	3	

Business Core Requirements (39 Credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ACCT 101	Introduction to Financial Accounting	3	0	3	
ACCT 102	Introduction to Managerial Accounting	3	0	3	ACCT 101
BUSN 101	Introduction to Business	3	0	3	
BUSN 301	Business Law	3	0	3	60 credits
ECON 101	Principles of Microeconomics	3	0	3	
ECON 102	Principles of Macroeconomics	3	0	3	ECON 101

FINC 101	Essentials of Financial Analysis	3	0	3	ACCT 101
MGMT 101	Principles of Management	3	0	3	
MGMT 205	Organizational Behavior	3	0	3	MGMT 101
MGMT 350	Business Ethics	3	0	3	MGMT 205 Co req: ENGL 205
MGMT 410	Business Policy and Strategic Management	3	0	3	Minimum 75 credits, MGMT 101
MRKG 101	Principles of Marketing	3	0	3	
MSYS 101	Principles of Management Information Systems	3	0	3	

Major Requirements (30 Credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MGMT 301	Operations Management	3	0	3	MGMT 101, MATH 115
MGMT 302	Managing Human Resources	3	0	3	MGMT 101
MGMT 303	Management and Leadership Development	3	0	3	MGMT 101
MGMT 305	International Business	3	0	3	MGMT 205, ECON 102
MGMT 306	Cross-Cultural Management	3	0	3	MGMT 205
MGMT 380	Project Management	3	0	3	FINC 101, ACCT 102, ENGL 205, and MGMT 301
BUSN 401	Business Research Methods	3	0	3	MATH 115, Min 70 credits
BUSN 402	Case study, project or dissertation	6	0	6	BUSN 401, 90 credits
MGMT 401	Internship	3	0	3	minimum of 90 credits and a CGPA of 2.00 Business senior standing, MGMT 101, FINC 101, MRKG 101

Major Electives (9 Credits)- Choose 3 courses:

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MGMT 310	Fundamentals of Family Business	3	0	3	MGMT 101 and ACC 102
MGMT 312	Negotiations and Conflict Management	3	0	3	MGMT 101
MGMT 313	Managing Change and Innovation	3	0	3	MGMT 205

MGMT 314	Management Intervention and Consultation	3	0	3	MGMT 301
BUSN 410	Artificial Intelligence for Business	2	1	3	MATH 115 or MATH 153, ENGL 102, COSC 101, min 90 credits
MGMT 403	Entrepreneurship	3	0	3	Minimum 70 credits, MGMT 101

Professional Elective Options (9 Credits)

Students pursuing a Bachelor of Business Administration in Management must complete a minimum of 9 elective credits. Elective credits can be earned via any courses offered at or above the 200 level.

Total number of units: **125**

Bachelor of Science in Computer Engineering
Curriculum Plan

General Education Requirements (38 credits)

English Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ENGL 101	Composition I	3	0	3	
ENGL 102	Composition II	3	0	3	ENGL 101
ENGL 205	Business Communication	3	0	3	

Arab Heritage Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 101 or ARHG 104	Arabic for non-Arabic speakers/ Arabic for Arabic speakers	3	0	3	
ARHG 102	Modern History of Bahrain	3	0	3	

Mathematics Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MATH 151	Calculus I	3	0	3	Math 099 or Math Placement Test
MATH 152	Calculus II	3	0	3	MATH 151 or MATH 153

Natural Sciences Requirements (8 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CHEM 101/L	Introductory Chemistry	3	1	4	
PHYS 101/L	Principles of Physics I	3	1	4	MATH 099

Social Science Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 103	Human Rights	3	0	3	
PSYC 101	Introduction to Psychology	3	0	3	
SOCS 101	Introduction to Sociology	3	0	3	

Engineering Core Requirements (17 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CIVL 200	Engineering Mechanics - Statics	3	0	3	PHYS 101
CMPE 160	Introduction to Computer Programming and Applications	3	0	3	MATH 099 or passing the Math Placement Test
ENGR 201	Methods of Analysis	3	0	3	MATH 152 or MATH 154
MATH 252	Calculus III	4	0	4	MATH 152 or MATH 154

PHYS 102	Principles of Physics II	3	1	4	PHYS 101, (MATH 152 or MATH 154)

Major Lower-Level Requirements (21 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CMPE 270	Digital Systems	3	0	3	MATH 151 or MATH 153
CMPE 270L	Digital Systems Laboratory	0	1	1	Co-requisites: CMPE 270
CMPE 271	Computer Organization	3	0	3	(CMPE 160 OR COSC 102) and CMPE 270
ELEC 210	Circuit Analysis I	3	0	3	PHYS 102, (MATH 152 or MATH 154)
MATH 203	Discrete Mathematics	3	0	3	MATH 151 or MATH 153
MATH 254	Introduction to Linear Algebra	4	0	4	MATH 151 or MATH 153
MATH 260	Probability and Statistics	4	0	4	MATH 152 or MATH 154

Major Upper-Level Requirements (36 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CMPE 361	Windows Programming	3	0	3	(CMPE 160 or COSC 102) and CMPE 271
CMPE 375	Embedded Systems Programming	3	0	3	CMPE 271
CMPE 460	Software Design and Engineering	3	0	3	CMPE 361
CMPE 460L	Software Design and Engineering Laboratory	0	1	1	Co-requisites: CMPE460
CMPE 470	Digital Circuits	3	0	3	CMPE 375
CMPE 470L	Digital Logic Laboratory	0	1	1	Co-requisites: CMPE 470
CMPE 475	Microprocessors	3	0	3	CMPE 375
CMPE 495A	Engineering Design: Capstone Project I	3	0	3	Senior level (90 credits) CMPE 460, CMPE 470/L
CMPE 495B	Engineering Design: Capstone Project II	3	0	3	CMPE 495A
ELEC 310	Circuit Analysis II	3	0	3	ELEC 210 and MATH 252
ELEC 330	Fundamentals of Engineering Electronics	3	0	3	ELEC 210
ELEC 330L	Engineering Electronics Laboratory	0	1	1	Co-requisites: ELEC 330
CMPE 405	Computer Engineering Internship	6	0	6	Senior level (90 Credits)

Professional Electives (12 credits)

Students pursuing the Bachelor of Science in Computer Engineering must complete a minimum of 12 elective credits per the following:

- One approved elective course in mathematics at 300 level or above (3 credits)
- Three engineering elective courses (9 credits)

At least one course from the following list:

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
COSC 448	Mobile Programming II	3	0	3	COSC 348, COSC 312
COSC 442	Artificial Intelligence	3	0	3	CMPE 390
COSC 484/L	Web Engineering and Laboratory	2	1	3	COSC 312
COSC 412	Implementation of Database Systems	3	0	3	COSC 312
COSC 463	Data Mining Techniques	3	0	3	COSC 412
CMPE 560	Computer and Data Networks	3	0	3	
CMPE 561	Windows Database and Web Programming	3	0	3	
CMPE 565	Multimedia Communication Systems	3	0	3	
CMPE 571	Real-Time Operating Systems	3	0	3	
CMPE 572	VLSI Circuit Design	3	0	3	
ELEC 410	Signals and Systems	3	0	3	
ELEC 556	Digital Signal Processing	3	0	3	

At most two courses from the following list:

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CMPE 390	Introduction to Machine Learning and Data Analytics	3	0	3	MATH 260, (CMPE 160 or COSC 102)
COSC 312	Design and Usage of Databases	3	0	3	MATH 203 and COSC 125
COSC 372/L	Operating Systems and Laboratory	3	1	4	CMPE 271
COSC 348	Mobile Programming I	3	0	3	(CMPE 160 or COSC 102) and CMPE 271
COSC 371	Computer Organization II	3	0	3	CMPE 271

Total number of units: 124

Bachelor of Science in Computer Science
Curriculum Plan

General Education Requirements (42 credits)

English Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ENGL 101	Composition I	3	0	3	
ENGL 102	Composition II	3	0	3	ENGL 101
ENGL 205	Business Communication	3	0	3	

Arab Heritage Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 101 OR ARHG 104	Arabic for non-Arabic speakers OR Arabic for Arabic speakers	3	0	3	
ARHG 102	Modern History of Bahrain	3	0	3	

Mathematics Requirements (10 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MATH 151	Calculus I	3	0	3	Math 099 or passing Math placement test
MATH 152	Calculus II	3	0	3	MATH 151
MATH 252	Calculus III	4	0	4	MATH 152

Natural Sciences Requirements (8 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CHEM 101/L	Introductory Chemistry	3	1	4	
PHYS 101/L	Principles of Physics I	3	1	4	MATH 099

Social Sciences Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 103	Human Rights	3	0	3	
PSYC 101	Introduction to Psychology	3	0	3	
SOCS 101	Introduction to Sociology	3	0	3	

Major Requirements (79 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
COSC 110	Introduction to Computer Science and Networks	3	0	3	
COSC 125	Data Structures and Programming Techniques	3	0	3	CMPE 160
CMPE 160	Introduction to Computer Programming and Applications	3	0	3	Math 099 or passing Math placement test
MATH 203	Discrete Mathematics	3	0	3	MATH 151
COSC 210	Management Information Systems	3	0	3	COSC 110
COSC 215	Communication Networks	3	0	3	COSC 125

MATH 254	Introduction to Linear Algebra	4	0	4	MATH 151
COSC 248	Algorithms and Complexity	3	0	3	MATH 203, COSC 125
MATH 260	Probability and Statistics	4	0	4	MATH 152
COSC 262	Operations Research	3	0	3	MATH 152
CMPE 270	Digital Systems	3	0	3	MATH 151
CMPE 270L	Digital Systems Laboratory	0	1	1	Corequisite: CMPE 270
CMPE 271	Computer Organization	3	0	3	CMPE 160 and CMPE 270
CMPE 361	Windows Programming	3	0	3	CMPE 160 and CMPE 271
COSC 312	Design and Usage of Databases	3	0	3	MATH 203, COSC 125
COSC 372	Operating Systems	3	0	3	CMPE 271
COSC 372L	Operating Systems Laboratory	0	1	1	Corequisite: COSC 372
CMPE 390	Introduction to Machine Learning and Data Analytics	3	0	3	MATH 260, CMPE 160
COSC 405	Computer Science Internship	3	0	3	Senior Standing
COSC 412	Implementation of Database Systems	3	0	3	COSC 312
COSC 413	Protection and Security of Information Systems	3	0	3	COSC 372, COSC 215
COSC 442	Artificial Intelligence	3	0	3	CMPE 390
COSC 467	Network Management	3	0	3	COSC 215
CMPE 460	Software Design and Engineering	3	0	3	CMPE 361
CMPE 460L	Software Design and Engineering Laboratory	0	1	1	Corequisite: CMPE 460
COSC 484	Web Engineering	2	0	2	COSC 312
COSC 484L	Web Engineering Laboratory	0	1	1	Corequisite: COSC 484
COSC490	Senior Design Project	3	0	3	CMPE 460, 90 credits, GPA 2.0
COSC 490L	Senior Design Project Laboratory	0	1	1	Corequisite: COSC 490
COSC 491L	Senior Project Laboratory	0	1	1	COSC 490/L

Major Electives (6 credits)

Students will choose 2 courses from this list:

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
COSC 371	Computer Organization II	3	0	3	CMPE 271
COSC 463	Data Mining Techniques	3	0	3	COSC 412
COSC 472	Cryptography	3	0	3	COSC 248
CMPE 375	Embedded Systems Programming	3	0	3	CMPE 271
COSC 348	Mobile programming I	3	0	3	CMPE 271, CMPE 160
COSC 448	Mobile Programming II	3	0	3	COSC 348, COSC 312

Total number of units: 127

Bachelor of Science in Industrial Engineering
Curriculum plan

General Education Requirements (38 credits)

English Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ENGL 101	Composition I	3	0	3	
ENGL 102	Composition II	3	0	3	ENGL 101
ENGL 205	Business Communication	3	0	3	

Arab Heritage Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 101 or ARHG 104	Arabic for Non-Arabic Speakers OR Arabic for Arabic Speakers	3	0	3	
ARHG 102	Modern History of Bahrain	3	0	3	

Mathematics Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MATH 151	Calculus I	3	0	3	MATH 099 or passing the Math placement test
MATH 152	Calculus II	3	0	3	MATH 151

Natural Sciences Requirements (8 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CHEM 101/L	Introductory Chemistry	3	1	4	
PHYS 101/L	Principles of Physics I	3	1	4	MATH 099

Social Science Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 103	Human Rights	3	0	3	
PSYC 101	Introduction to Psychology	3	0	3	
SOCS 101	Introduction to Sociology	3	0	3	

Engineering Core Requirements (17 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CIVL 200	Engineering Mechanics - Statics	3	0	3	PHYS 101
CMPE 160	Introduction to Computer Programming and Applications	3	0	3	MATH 099 or passing the Math Placement Test
ENGR 201	Methods of Analysis	3	0	3	MATH 152
MATH 252	Calculus III	4	0	4	MATH 152
PHYS 102	Principles of Physics II	3	1	4	PHYS 101, MATH 152

Major Lower-Level Requirements (17 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ELEC 204	Principles of Electrical Engineering	3	0	3	MATH 152 and PHYS 102
MATH 260	Probability and Statistics	4	0	4	MATH 152
MECH 101	Solid Modeling I	3	0	3	MATH 151
MECH 210	Materials Science	3	0	3	CHEM 101
NDSE 120	Introduction to Industrial Engineering	1	0	1	
NDSE 202	Operations Research I: Linear Models	3	0	3	MATH 152

Major Upper-Level Requirements (44 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CMPE 390	Introduction to Machine Learning and Data Analytics	3	0	3	MATH 260, CMPE 160
ECON 341	Engineering Economic Analysis	3	0	3	MATH 152
MGMT 404	Technology Entrepreneurship	3	0	3	NDSE 120, NDSE 202, NDSE 306, ECON 341
NDSE 303	Operations Research II: Nonlinear Models	3	0	3	NDSE 202
NDSE 304	Operations Research III: Stochastic Models	4	0	4	NDSE 303, MATH 260
NDSE 306	Systems Simulation	3	0	3	MATH 260
NDSE 312	Facilities Design and Planning	3	0	3	NDSE 120, NDSE 202
NDSE 381	Safety Engineering	3	0	3	NDSE 120
NDSE 413	Supply Chain Management	4	0	4	NDSE 312
NDSE 423	Quality Engineering	3	0	3	MATH 260
NDSE 495A	Engineering Design: Capstone Project I	3	0	3	NDSE 306, NDSE 304, NDSE 381, NDSE 312, ECON 341, NDSE 405 Senior level (90 credits)
NDSE 495B	Engineering Design: Capstone Project II	3	0	3	NDSE 495A
NDSE 405	Industrial Engineering Internship	6	0	6	NDSE 423, NDSE 312, NDSE 381, Senior level (90 credits)

Professional Electives (9 credits)

Students pursuing the Bachelor of Science in Industrial Engineering must complete a minimum of 9 elective credits of industrial engineering (NDSE) courses offered at or above the 400 level and/or 300 level or above from the approved list of courses from other programs.

At least one course from the following list:

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
COSC 442	Artificial Intelligence	3	0	3	CMPE 390
COSC 463	Data Mining Techniques	3	0	3	COSC 412
MGMT 410	Business Policy and Strategic Management	3	0	3	MGMT 404, Passing 75 credits
MGMT 380	Project Management	3	0	3	ENGL 205, ECON 341

At most two courses from the following list:

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MGMT 301	Operation Management	3	0	3	MATH 260
MGMT 302	Managing Human Resources	3	0	3	NDSE 120
MGMT 303	Management and Leadership Development	3	0	3	NDSE 120
MGMT 305	International Business	3	0	3	NDSE 120, ECON 341
MGMT 306	Cross cultural Management	3	0	3	NDSE 120
MGMT 350	Business Ethics	3	0	3	ENGL 205
CIVL 355	Environmental Engineering	3	0	3	CHEM 101

Total number of units: 125

Bachelor of Science in Civil Engineering
Curriculum plan

General Education Requirements (38 credits)

English Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ENGL 101	Composition I	3	0	3	
ENGL 102	Composition II	3	0	3	ENGL 101
ENGL 205	Business Communication	3	0	3	

Arab Heritage Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 101 OR ARHG 104	Arabic for non-Arabic speakers OR Arabic for Arabic speakers	3	0	3	
ARHG 102	Modern History of Bahrain	3	0	3	

Mathematics Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MATH 151	Calculus I	3	0	3	Math 099 or passing Math placement test
MATH 152	Calculus II	3	0	3	MATH 151

Natural Sciences Requirements (8 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CHEM 101/L	Introductory Chemistry	3	1	4	
PHYS 101/L	Principles of Physics I	3	1	4	MATH 151

Social Sciences Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 103	Human Rights	3	0	3	
PSYC 101	Introduction to Psychology	3	0	3	
SOCS 101	Introduction to Sociology	3	0	3	

Engineering Core Requirements (17 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CIVL 200	Engineering Mechanics - Statics	3	0	3	PHYS 101
CMPE 160	Introduction to Computer Programming and Applications	3	0	3	Passing the Math Placement Test or MATH 099
ENGR 201	Methods of Analysis	3	0	3	MATH 152
MATH 252	Calculus III	4	0	4	MATH 152

PHYS 102	Principles of Physics II	3	0	3	PHYS 101, MATH 152
PHYS 102L	Principles of Physics II Laboratory	0	1	1	Co-requisite: PHYS 102

Major Requirements (63 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CIVL 100	Introduction to Civil Engineering	1	0	1	
CIVL 120	Computer Applications in Civil Engineering	3	0	3	MATH 152
CIVL 121	Computer Graphics for the Built Environment	3	0	3	CMPE 160
CIVL 160	Statistical Methods for the Built Environment	3	0	3	MATH 152
CIVL 218	Surveying for Civil Engineering and Construction	3	0	3	CIVL 160, MATH 152
CIVL 220	Civil and Environmental Engineering Computer Applications	3	0	3	CIVL 121
ELEC 204	Principles of Electrical Engineering	3	0	3	MATH 152, PHYS 102
MECH 240	Introduction to Engineering Materials	3	0	3	CIVL 200, CHEM 101
MECH 240L	Introduction to Engineering Materials Laboratory	0	1	1	Co-requisite: MECH 240
CIVL 301	Introduction to Solid Mechanics	3	0	3	CIVL 200
CIVL 301L	Solid Mechanics Laboratory	0	1	1	Co-requisite: CIVL 301
CIVL 321	Structural Analysis I	3	0	3	CIVL 301, CIVL 301L
CIVL 355	Environmental Engineering	3	0	3	CHEM 101
CIVL 401	Civil Engineering and Society	1	0	1	senior standing
CIVL 444	Applied Hydraulics	3	0	3	MECH 360
CIVL 462	Geotechnical Engineering	3	0	3	CIVL 301 or MECH 360
CIVL 462L	Geotechnical Engineering Laboratory	0	1	1	Co-requisite: CIVL 462
CIVL 481	Transportation Engineering	3	0	3	CIVL 218
CIVL 495A	Engineering Design: Capstone Project I	3	0	3	Completing 90 credits or above, completing the internship and CGPA 2.0
CIVL 495B	Engineering Design: Capstone Project II	3	0	3	CIVL 495A
ECON 341	Engineering Economic Analysis	3	0	3	MATH 152
MECH 360	Introduction to Fluid Mechanics	3	0	3	MATH 252
MECH 360L	Introduction to Fluid Mechanics Laboratory	0	1	1	Co-requisite: MECH 360

CIVL 405	Civil Engineering Internship	6	0	6	90 credits and above and CGPA 2.0

Professional Electives (12 credits)

Students pursuing the Bachelor of Science in Civil Engineering must complete a minimum of 12 elective credits from six specialization options with a maximum of six credits from any one specialization.

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CIVL 421	Reinforced Concrete Design	3	0	3	CIVL 321
CIVL 445	Applied Hydrology	3	0	3	CIVL 444
CIVL 465	Foundation Engineering and Earth Retaining Structures	3	0	3	CIVL 462/L
CIVL 482	Highway Engineering	3	0	3	CIVL 481
CIVL 491	Construction Methods	3	0	3	CIVL 321
CIVL 492	Construction Engineering	3	0	3	CIVL 491
CIVL 441	Structural Analysis II	3	0	3	CIVL 321
CIVL 525	Design of Steel Structures	3	0	3	CIVL 321
CIVL 528	Masonry Structures Design	3	0	3	CIVL 301, CIVL 321
CIVL 530	Open Channel Hydraulics	3	0	3	CIVL 444
CIVL 580	Traffic Engineering Design	3	0	3	CIVL 481

Total number of units: 130

Bachelor of Science in Mechanical Engineering
Curriculum plan

General Education Requirements (38 credits)

English Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ENGL 101	Composition I	3	0	3	
ENGL 102	Composition II	3	0	3	ENGL 101
ENGL 205	Business Communication	3	0	3	

Arab Heritage Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 101 OR ARHG 104	Arabic for non-Arabic speakers OR Arabic for Arabic speakers	3	0	3	
ARHG 102	Modern History of Bahrain	3	0	3	

Mathematics Requirements (6 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MATH 151	Calculus I	3	0	3	Math 099 or passing Math placement test
MATH 152	Calculus II	3	0	3	MATH 151

Natural Sciences Requirements (8 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CHEM 101/L	Introductory Chemistry	3	1	4	
PHYS 101/L	Principles of Physics I	3	1	4	MATH 099

Social Sciences Requirements (9 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
ARHG 103	Human Rights	3	0	3	
PSYC 101	Introduction to Psychology	3	0	3	
SOCS 101	Introduction to Sociology	3	0	3	

Engineering Core Requirements (17 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
CIVL 200	Engineering Mechanics - Statics	3	0	3	PHYS 101
CMPE 160	Introduction to Computer Programming and Applications	3	0	3	Passing the Math Placement Test or MATH 099
ENGR 201	Methods of Analysis	3	0	3	MATH 152
MATH 252	Calculus III	4	0	4	MATH 152

PHYS 102	Principles of Physics II	3	0	3	PHYS 101, MATH 152
PHYS 102L	Principles of Physics II Laboratory	0	1	1	Co-requisite: PHYS 102

Major Requirements (68 credits)

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
PHYS 105	Principles of Physics III	3	0	3	PHYS 102
PHYS 105L	Principles of Physics III Laboratory	0	1	1	Co-requisite: PHYS 105
ELEC 204	Principles of Electrical Engineering	3	0	3	MATH 152, PHYS 102
MECH 101	Solid Modeling I	3	0	3	MATH 151
MECH 102	Solid Modeling II	3	0	3	MECH 101
MECH 220	Engineering Mechanics - Dynamics	3	0	3	CIVL 200
MECH 240	Introduction to Engineering Materials	3	0	3	CHEM 101, CIVL 200
MECH 240L	Materials Laboratory	0	1	1	Co-requisite: MECH 240
CIVL 301	Introduction to Solid Mechanics	3	0	3	CIVL 200
MECH 310	Introduction to Engineering Design	3	0	3	MECH 102, MECH 220
MECH 312	Simulation of Engineering Systems	3	0	3	MECH 220, CMPE 160, ELEC 204 and MATH 252
MECH 314	Engineering Design: Mechanical Components	3	0	3	CIVL 301, MECH 220
MECH 330L	Control Systems Laboratory	0	1	1	ELEC 204, ENGR 201, MECH 220
MECH 340	Materials, Manufacturing, and Design	3	0	3	CIVL 301, MECH 240, and MECH 240L
MECH 350	Thermodynamics	3	0	3	CIVL 200, MATH 252, PHYS 105
MECH 351	Engineering Thermodynamics	3	0	3	MECH 350
MECH 360	Introduction to Fluid Mechanics	3	0	3	MATH 252
MECH 360L	Introduction to Fluid Mechanics Laboratory	0	1	1	Co-requisite: MECH 360
MECH 405	Mechanical Engineering Internship	6	0	6	Senior Standing (90 credits and above), CGPA 2.0
MECH 452	Principles of Heat Transfer	3	0	3	MECH 360
MECH 490L	Mechanical and Thermal Systems Laboratory	0	1	1	MECH 314, MECH 330L, MECH 351, and MECH 452
MECH 495A	Engineering Design: Capstone Project I	3	0	3	MECH 405, 90 credits, CGPA 2.0
MECH 495B	Engineering Design: Capstone Project II	3	0	3	MECH 495A
MECH 496	Advanced Machine Design	3	0	3	MECH 314 and MECH 340

MECH 498	Thermal Systems Analysis and Design	3	0	3	MECH 351 and MECH 452

Major Electives (9 credits)

Students pursuing the Bachelor of Science in Mechanical Engineering must complete a minimum of three elective courses in mechanical engineering courses or approved courses from other departments.

Course Code	Course title	Credit units			Pre-requisites
		LEC	LAB	Total	
MECH 210	Materials Science	3	0	3	CHEM 101
MECH 355	Continuum Mechanics	3	0	3	CIVL 301 and MECH 312
MECH 357	Introduction to Mechanical Vibrations	3	0	3	MECH 220, CMPE 160, and MATH 252
MECH 358	Automatic Control Systems	3	0	3	MECH 220, CMPE 160, and MATH 252
MECH 365	Nonmetallic Materials	3	0	3	MECH 240, CIVL 301 and MECH 340
MECH 368	Powder-Based Manufacturing	3	0	3	MECH 340
MECH 408	Computer-Aided Manufacturing	3	0	3	ENGR 201, MECH 102, MECH 314, and MECH 340
MECH 410	Heating, Ventilating and Air-Conditioning	3	0	3	MECH 351 and MECH 452
MECH 415	Solar Energy Conversion	3	0	3	MECH 351 and MECH 452
MECH 420	Biomechanics	3	0	3	CIVL 301, MECH 240 and MECH 360
MECH 425	Micro-Electro-Mechanical Systems	3	0	3	ELEC 204, MECH 220, and MECH 240

Total number of units: 132