Major
Architectural Engineering

Program
College of Engineering and Advanced Computing
Major

Bachelor of Architectural Engineering Study Plan

Fall (Year 1)

Item #	Title	Credits
SE 100	Programming for Engineers	3
SE 100 L	Programming for Engineers Lab	1
CHM 102	Introduction to Chemistry	3
CHM 102 L	Introduction to Chemistry lab	1
MAT 101	Calculus I	3
PHU 103	Mechanics and Waves for Engineers	3
PHU 103 L	Mechanics and Waves for Engineers Labs	1
ENG 101	Freshman English 1	3

Spring (Year 1)

Item #	Title	Credits
ARE 110	Architectural History and Theories	3
ARE 120	Drafting and Drawing	1
ARE 120-S	Drafting and Drawing Lab	2
ME 201	Materials Science and Engineering	3
ME 201 L	Materials Science and Engineering Lab	1
MAT 112	Calculus II	3
PHU 124	Electromagnetism and Waves for Engineers	3
PHU 124 L	Electromagnetism and Waves for Engineers Labs	1
ENG 112	Freshman English II	3

Fall (Year 2)

Item #	Title	Credits
ARE 201	Architectural Design I	3
ARE 231	Building Materials and Construction Technology	3
ARE 231 L	Building Materials and Construction Technology Lab	1
ARE 232	Building Construction	3
BME 207	Electrical Circuits in Biomedical Engineering	3
BME 207 L	Electrical Circuits in Biomedical Engineering	1
ME 203	Applied Mechanics I: Statics	3
MAT 211	Calculus III	3

Spring (Year 2)

Item #	Title	Credits
ARE 202	Architectural Design II	3
ARE 220	Construction Drawing (CAD)	2
ARE 220 S	Construction Drawing (CAD) Studio	2
ARE 297	Architecture and Buildings	3
ME 206	Thermal Fluids Engineering I	3
ME 206 L	Thermal Fluids Engineering I Lab	1
ARB 101	Arabic Language I	2
ENG 222	Technical Writing	3

Fall (Year 3)

Item #	Title	Credits
ARE 303	Interior Design	2
ARE 303 S	Interior Design Studio	1
ARE 355	Quantity Surveying	3
ARE 341	The Built Environment	3
ME 407	Heating, Ventilation, and Air-Conditioning	3
MAT 212	Linear Algebra	3
MAT 213	Differential Equations	3
ISL 101	Islamic Studies I	2

Spring (Year 3)

Item #	Title	Credits
ARE 311	Building Acoustics	3
ARE 313	Electrical Installations	3
ARE 315	Lighting Systems and Applications	3
ARE 321	Structural Mechanics	3
ARE 321 L	Structural Mechanics Lab	1
ARE 232	Building Construction	3
ARE 332 L	Building Services Engineering Lab	1

Summer (Year 3)

Item #	Title	Credits
ARE 390	Architectural Engineering Summer Internship	0

Fall (Year 4)

Item #	Title	Credits
ARE 405	Structural Analysis	3
ARE 409	Project Management and Economics	3

ARE 410	Contracts and Liabilities for Buildings and Construction	3
ARE 412	Environmental Management and Policy	3
	ARE *** - Technical Elective I	3
	ARE 4** - Technical Elective II	3
ARE 491	Architectural Engineering Capstone Project I	2

Spring (Year 4)

Item #	Title	Credits
ARE 406	Fundamentals of Reinforced Concrete Design	3
ARE 465	Management Principles in Building Engineering	3
ARE 492	Architectural Engineering Capstone Project II	2
	ARE 4 ** - Technical Elective III	3
MAT 224	Numerical Methods	3
ARB 112	Arabic Language II	2
ISL 112	Islamic Studies II	2

Technical Electives

Item #	Title	Credits
ARE 302	Indoor Air Quality Engineering	3
ARE 314	Architectural Design III	2
ARE 314 S	Architectural Design III Studio	1
ARE 400	Special Topics in Architectural Engineering	3
ARE 435	Undergraduate Research in Architectural Engineering	0
ARE 452	Soil Mechanics and Foundations	3
ARE 455	Sustainable Buildings	3
ARE 460	Waste Management in Buildings	3
ARE 470	Building Automation and Control	3
ARE 475	Building Energy Management	3
ARE 477	Smart Buildings	3
ARE 480	Construction Economics and Finance	3
ARE 482	Operation Analysis in Building Construction	3
ARE 484	Construction Professional Practice	3

Architectural Engineering Tracks:

Construction Management Track

Construction management is primarily concerned with getting the project completed on time, budget and to the desired and stated specification. The course teaches the students how to manage and lead a construction project, using technical and leadership skills, within a multi-organizational team that work on a project's lifecycle. Construction Management looks at engineering management as a cohesive process, examining projects from initiation through to completion, directing, planning and scheduling and communication which are key for the project success. Students get grips with a wide range of project management tools and techniques that are commonly used in the industry. Students who successfully complete the course will have gained practical experience with project management, allowing them to excel within their current role or in the next job. The construction management course offers:

- Get a critical understanding of the social, economic and environmental issues commonly affecting construction problems and the practical means to address them. Practical case studies will be presented to examine how project sites are equipped, manned and managed. Site visits will also be part of the teaching activities.
- Gain experience with important project management tools, techniques and software.
- Become contractually familiar with laws surrounding construction, particularly construction contract law.
- Examine case studies and develop appropriate project management processes and strategies.
- Gain an understanding of financial planning (planned and earned values).

Track Course Requirements (15 CRHs)

In addition to completing the core courses **ARE 409 – Project Management and Economics** and **ARE 465 – Management Principles in Building Engineering**, students should complete the following three technical electives courses:

Item #	Title	Credits
ARE 480	Construction Economics and Finance	3
ARE 482	Operation Analysis in Building Construction	3
ARE 484	Construction Professional Practice	3

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Item #	Title	Credits
ARE 480	Construction Economics and Finance	3
ARE 482	Operation Analysis in Building Construction	3

Spring (Year 4)

Item #	Title	Credits
ARE 484	Construction Professional Practice	3

Sustainable Development Track

Reducing building energy consumption through adaptive and sustainable design has become a basic criterion of architectural practice. The aim of this track is to deepen students' understanding and knowledge about basic principles and best practices of sustainability and high-performance buildings. Through this track, students will be able to develop problem-solving skills and market-driven solutions, which will help them become leaders in sustainable design and better serve their society. Emphasis will be placed on the analysis of the environmental impacts of buildings, and how we can mitigate these impacts through various and innovative design solutions/practices.

Through three electives students will be equipped with knowledge related to creating sustainable building structures and using processes and systems that are environmentally responsible and resource-efficient. These courses will address a full range of issues associated with sustainable building including energy and water

efficiency, materials, waste and storm-water management, and the building operational efficiency in relation to the use of advanced and smart technologies. There will be also a focus on principles of smart (IoT) and green building systems, and how the components of these two systems can integrate and interact with one another.

Track Course Requirements (15 CRHs)

In addition to completing the core courses **ARE 341 – The Built Environment** and **ARE 412 – Environmental Management and Policy**, students should complete the following three technical electives courses:

Item #	Title	Credits
ARE 455	Sustainable Buildings	3
ARE 475	Building Energy Management	3
ARE 477	Smart Buildings	3

Track Plan

Fall (Year 4)

Item #	Title	Credits
ARE 455	Sustainable Buildings	3
ARE 475	Building Energy Management	3

Spring (Year 4)

Item #	Title	Credits
ARE 477	Smart Buildings	3