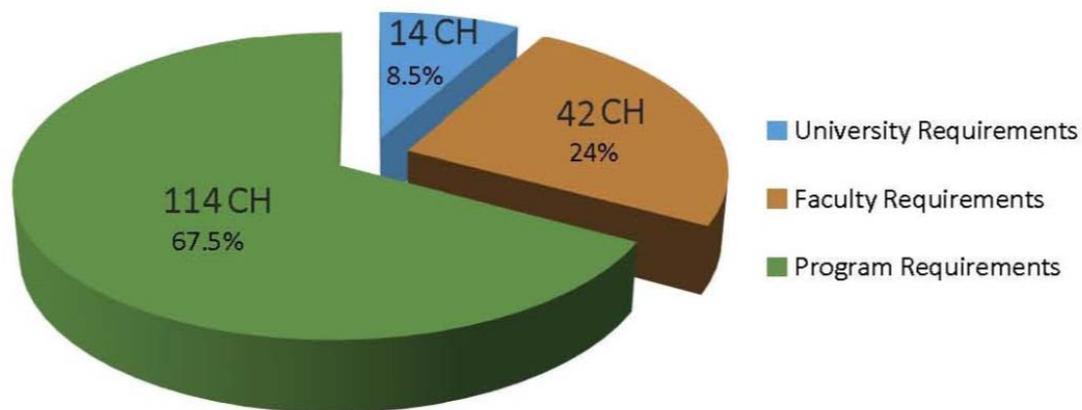


Building Engineering Program



Program Description

The work of the architect and civil engineer are closely linked. The Building Engineering program keeps this in mind. The aim of the Building Engineering Program is to graduate civil engineers who are capable of generating effective solutions by using engineering approaches in the field of Building Engineering. The graduates of the program will be well versed in technology, social, and environmental issues. The program aims to supply the students with the advanced concepts of structure design. Student will have basics of steel, concrete structure design and water tanks design, according to recent design codes versions. Also, Student will have basics of dynamic, earthquake, using recent design codes versions. Management of project recourses, risk, and safety are essential knowledge for structure engineer.

Career Prospects

Graduates of this department has a variety of opportunities to work, of the building engineering program, you will be qualified for positions at companies specializing in the design, analysis, operation, construction, and management of a wide range of residential, commercial, and industrial building projects. Our graduates can be found at numerous companies and organizations, for example:

- Government authorities,
- Consulting firms in civil engineering and construction,
- Civil engineering contractors and project managers,
- Environmental engineering organizations.

Program Concentrations

The program provides the undergraduate student with a thorough foundation and technologies in the basic tenets of Structural, Construction Project Managements and Environmental Engineering. The program provides three different fields in which the students in this program can specialize. These three fields are:

- Structural Engineering
- Construction Engineering Management
- Environmental and Sustainable Building Engineering

1- **Structural Engineering** is concerned with the structural design and structural analysis of buildings, bridges, towers and other structures. This involves identifying the loads which act upon a structure and the forces and stresses which arise within that structure due to those loads, and then designing the structure to successfully support and resist those loads. The loads can be self-weight of the structures, other dead load, live loads, moving (wheel) load, wind load, earthquake load, load from temperature change etc. The structural engineer must design structures to be safe for their users and to successfully fulfil the function they are designed for (to be serviceable). Due to the nature of some loading conditions, sub-disciplines within structural engineering have emerged, including wind engineering and earthquake engineering.

2- **Construction Engineering Management** gives students a specialized focus on planning, scheduling, Resources Management, quantity take off, computer applications, cost estimating, Risk and Safety Management, contracts, problem solving, people and networking, management and leadership skills.

3- **Environmental and Sustainable Building Engineering** gives students a specialized focus on how to: Reducing the demand for energy and the energetic consumption of buildings, Taking advantage of climate and natural resources to develop passive design strategies and sustainable architecture, Reusing and recycling building components and materials, Extending the lifetime of products and buildings, Adopting a sustainable environmental use, participatory planning and design, Reducing urban sprawl, promoting urban renewal, and protecting natural areas, Planning, designing and building in respect of natural constraints.

Agreements with another University

The program is in partnership with the University of East London (UEL), United Kingdom for a Bachelor Dual Degree. Students joining this agreement will pay an additional fee, to substitute expenses for the external Quality Audits/Moderation Boards that will take place in Egypt. The Graduates should receive two B.Sc. certificates, one from the University of East London, and one from Ain Shams University. Students are allowed to study a full year or more in London with a 10% reduction in the UK tuition fees.

Study Requirements

To obtain the Bachelor of Science Degree in Engineering, the student must successfully complete 180 credit hours, with a GPA at graduation of at least 2.0.

The study requirements are divided into:

University Requirements

To achieve this goal, Ain Shams University has designed a number of courses planned to build the student personality, develop his skills, and increase his awareness of different topics. These courses are called University Requirements. The Faculty of Engineering Ain Shams University has selected some of these courses to be offered within the Engineering Programs. These courses are:

Course Code	Course Title	Credit Hours
ASU011	Technical English Language	0
ASU111	Human Rights	2
ASU112	Report Writing and Communication skills	3
ASU113	Professional Ethics and Legislations	3
ASU114	Selected Topics in Contemporary Issues	2
-	ASU Elective (1)	2
-	ASU Elective (2)	2
Total		14
Pool of ASU Elective (1) Courses		
ASU321	Innovation and Entrepreneurship	2
ASU322	Language Course – can accept equivalent certificates	2
ASU323	Introduction to Accounting	2
ASU324	History of Engineering and Technology	2
Pool of ASU Elective (2) Courses		
ASU331	Human Resources Management	2
ASU332	History of Architecture	2
ASU333	Introduction to Marketing	2
ASU334	Building Safety and Fire Protection	2
ASU335	Literature and Arts	2
ASU336	Business Administration	2

A placement test in English Language will be conducted for some admitted students to the Faculty of Engineering. If the student passes this test, then he will be exempted from taking the Technical English Language Course. The Technical English Language course is a pre-requisite for all Faculty requirements courses.

For ASU322 – Language course, any non-English language is accepted including Arabic. If a student has an equivalent certificate, he is exempted from taking this course. Examples of equivalent certificates: TOEFL, IELTS ... etc

Faculty Requirements

To achieve these Intended Learning Outcomes, a set of courses must be completed as a Faculty Requirement. These courses are divided into Basic Science Courses and Basic Engineering Courses.

Course Code	Course Title	Credit Hours
PHM011	Basic Mathematics	0
ENG111	Field Training	0
PHM012	Mathematics (1)	3
PHM013	Mathematics (2)	3
PHM021	Vibration and Waves	3
PHM022	Electricity and Magnetism	3
PHM031	Statics	3
PHM032	Dynamics	3
PHM041	Engineering Chemistry	3
PHM111	Probability and Statistics	2
MDP081	Production Engineering	3
MDP011	Engineering Drawing	3
CEP011	Projection and Engineering Graphics	3
CSE031	Computing in Engineering	2
ENG011	Fundamentals of Engineering	2
CES151	Structures and Properties of Construction Materials	2
CES171	Engineering Economics and Finance	2
CES271	Project Management Essentials in Construction	2
Total		42

A placement test in Mathematics will be conducted for all admitted students except some High School Degrees which are determined by the Faculty Council. If the student passes this test, then he will be exempted from taking Basic Mathematics Course. The Basic Mathematics course is a pre-requisite for all Faculty requirements courses

Specialization requirements

In order to get a Bachelor of Science Degree in Building Engineering program, and to satisfy the Program Competences, the following set of courses need to be completed.

Course Code	Course Title	Credit Hours
PHM112	Differential Equations and Numerical Analysis	4
CES113	Structural Mechanics	3
CES114	Strength of Materials	3
CES213	Structural Analysis	3
CES315	Introduction to Structural Dynamics	3
CES224	Concrete Structures Design (1)	3
CES324	Concrete Structures Design (2)	3
CES427	Concrete Structures Design (3)	3
CES325	Construction Engineering	3
CES241	Steel Structures Design (1)	3
CES344	Steel Structures Design (2)	3
CES152	Properties and Testing of Materials	2
CES251	Concrete Technology (1)	3
CES252	Concrete Technology (2)	3
CES454	Modern Building Materials	3
CES161	Geology	2
CES263	Soil Mechanics (1)	4
CES364	Soil Mechanics (2)	3
CES365	Foundation Design (1)	3
CES467	Foundation Design (2)	3
CES372	Construction Planning and Scheduling	3
CEP213	Surveying (1)	4
CEP214	Surveying (2)	4
CEP221	Introduction to Transportation and Traffic Engineering	3
CEI113	Fluid Mechanics for Civil Engineers	3
ARC143	Building Engineering Drawing	3
ARC466	Building Envelope Design	2
ARC161	Introduction to Lighting Systems	2
ARC263	Fundamentals of Building Acoustics	2
MEP213	Thermal Analysis of Buildings	3
MEP342	HVAC System Design	2
-	Building Engineering Concentration Elective (1)	3
-	Building Engineering Concentration Elective (2)	3
-	Building Engineering Concentration Elective (3)	3
-	Building Engineering Concentration Elective (4)	3
-	Building Engineering Concentration Elective (5)	3
CES493	Building Engineering Design Graduation Project (1)	3

CES494	Senior Seminar	2
CES495	Building Engineering Design Graduation Project (2)	3
Total		114

Technical Electives for Building Engineering

The student shall select five Technical Elective Courses from the following list. Accordingly, a total number of 15 credit hours should be earned.

- **Technical Electives for Structural Engineering**

Course Code	Course Title	Credit Hours
CES314	Computer Applications in Structural Design	3
CES421	Design of Prestressed Concrete and Bridges	3
CES428	Masonry	3
CES429	Advanced Design of Reinforced Concrete Structures	3
CES445	Steel Structures Design (3)	3
CES446	Advanced Design of Steel Structures	3

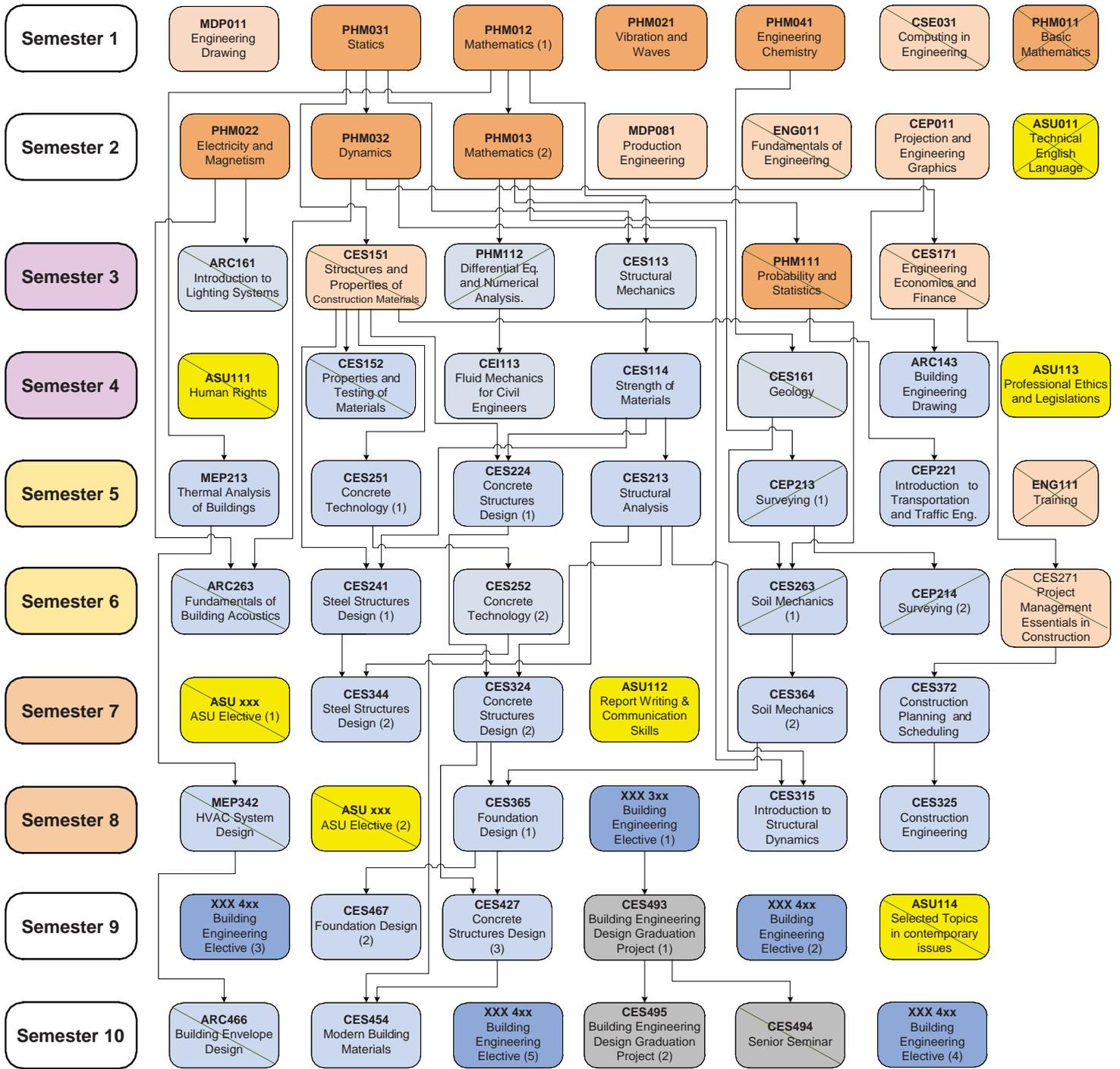
- **Technical Electives for Construction Engineering Management**

Course Code	Course Title	Credit Hours
CES373	Construction Cost Management	3
CES474	Resources Management	3
CES475	Project Risk and Safety Management	3
CES476	Legal Issues in Construction	3
CES477	Computer Applications in Construction Management	3
CES478	Quantity Surveying and Estimating	3

- **Technical Electives for Environmental and Sustainable Building Engineering**

Course Code	Course Title	Credit Hours
ARC367	Indoor Air Quality	3
ARC443	Computer Applications in Environmental Engineering	3
ARC468	Building Illumination and Day Lighting	3
ARC465	Building Acoustics	3
ARC467	Building Energy Conservation Technologies	3
CES455	Materials and Technologies for Sustainable Construction	3
CES480	Environmental Risk Management	3

Course Tree of Building Engineering Program – Bylaw 2018



- University Requirements
- Faculty Requirements (Basic Science)
- Specialization Requirements
- Specialization Requirements that require fourth-level standing
- Faculty Requirements (Basic Engineering)
- Specialization Requirements of Technical Electives (Prerequisites are determined according to the selected course)
- 0 Credit Hours
- 2 Credit Hours
- 3 Credit Hours
- 4 Credit Hours