



CIVIL ENGINEERING DEPARTMENT HANDBOOK

2022-23 Edition v2

Welcome to Civil Engineering:

The program, Department, and Profession

Message from the Head of Civil Engineering Department

We are delighted to have you join us as we embark on each new academic year. Our department provides students with the highest quality education in civil engineering, and we are proud of our commitment to excellence. Our faculty and staff are passionate about their work and strive to create an environment that encourages learning, innovation, and collaboration.

As a student in our department, you will have access to a wide range of courses and research opportunities. We offer courses in structural engineering, geotechnical engineering, water resources engineering, transportation engineering, construction management, environmental engineering, and more. Our faculty members are experts in their fields and will provide you with the knowledge and skills necessary for success in your chosen career path.

In addition to our course offerings, we also provide students with numerous research opportunities. Our faculty members are actively engaged in research projects that span a variety of topics related to civil engineering. We encourage students to participate in these projects as they gain valuable experience while making meaningful contributions to the field.

We also offer several student organizations that provide opportunities for networking and professional development. These organizations host events throughout the year such as guest lectures from industry professionals, panel discussions with alumni, field trips to local construction sites, and more.

Finally, our department is committed to providing students with the resources they need for success both inside and outside of the classroom. We look forward to having you join us! If you have any questions or concerns, please do not hesitate to reach out – we're here for you.



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1. The Mission of the Civil Engineering Department

Providing sophisticated academic education to graduate qualified civil engineers to meet the needs of the labor market, contribute to community service, and keep up with the professional development through self-learning and scientific research.

2. Objectives and Outcomes to Support the Department Mission

The objectives of the civil engineering program are summarized as follows:

- Prepare graduates to become qualified engineers in the field of civil engineering.
- Prepare graduates to work and communicate professionally and ethically with stakeholders in the labor market.
- Prepare qualified graduates to be admitted to postgraduate programs.

3. Orientation to the Civil Engineering Department

Being a student at Al-Baha University and the Civil Department, this expression you may have already heard "It is not like high school" from friends, family members, or guidance counselors that you will experience a different form of education when you enter college. Now, you should not be apprehensive about college, but it does imply that you should keep your eyes open to the new environment and learn to adjust.

During the next five years, you should find yourself gaining more self-reliance. However, self-reliance does not mean you have to do everything yourself; it does mean that you ask for help when you need it and stand on your own when you do not. Developing self-reliance should be one of your goals in the Civil Department.

3.1 History

The Civil Engineering Department was established after the foundation of the Faculty of Engineering in 1426/1427 AH to contribute to meeting the Kingdom's need for civil engineers. The civil engineering program qualifies students according to a study plan that extends for five academic years, during which the department works to build a scientific base that includes many engineering skills and knowledge in the fields of civil engineering, such as land and aerial surveying and all of its field applications, theories of structural analysis, in addition of traffic and transportation engineering applications and road networks design, as well as branches of irrigation, hydraulics, water resources, hydrology, water supply networks, sewage, sanitary and environmental engineering.

3.2 Code of Ethics

Al-Baha University values personal integrity. As a student at the Civil department, you are committed to respecting the faculty members, staff, and workers of the university's employees, and not exposing them to harm by word or deed in any way whatsoever. Also, you must commit to respecting the rules and arrangements related to the conduct and attending lectures. The student is committed to honesty, not attributing the work of others to himself, and avoiding cheating or participating in it by any way. The Code of Ethics of Al-Baha University found at <https://bu.edu.sa/en/web/policies-and-guidelines>

4. Faculty of the Civil Engineering Department.

Al-Baha University aims to provide an academic work environment to enhance the concept of teamwork and mutual respect among all employees, which shall be positively reflected in the quality of the outputs of the education. Also, the Civil Engineering Department is thrilled to welcome faculty staff to our vibrant department. This handbook serves as a comprehensive resource to help you navigate your role and responsibilities within the department.

For detailed information on faculty rights and responsibilities, please refer to the website below. This website outlines that created by Al-Baha University resources various policies, procedures, and specifically tailored for our faculty. The Polices & Regulations of Al-Baha University found at <https://bu.edu.sa/en/polices>

We hope you find this handbook informative and helpful. If you have any questions, please don't hesitate to contact the department chair.

4.1 Staff Directory

The department has 28 faculty members, including 6 Saudis employed by the department and 5 Saudis enrolled in master's or doctoral programs. The remaining 17 faculty members are non-Saudis on a contract basis.

#	Name	Information	Web page
1	Abdulaziz S. Alzahrani	✓ Head of Civil Engineering Department ✓ Assistant Professor ✓ Water Resources and Environmental ✓ Contact: aseidan@bu.edu.sa	https://bu.edu.sa/web/aseidan
2	Ahmed M. El-Sheikh	✓ Professor ✓ Engineering Mathematics ✓ Contact: aelsheikh@bu.edu.sa	https://bu.edu.sa/web/aelsheikh
3	Jamil A. Almaqtari	✓ Professor ✓ Transportation Engineering ✓ Contact: janji@bu.edu.sa	https://bu.edu.sa/web/jnaji
4	Osman M. Najjar	✓ Associate Professor ✓ Water Resources Engineering ✓ Contact: onajjar@bu.edu.sa	https://bu.edu.sa/web/onajjar
5	Brahim M. Bousalem	✓ Associate Professor ✓ Concrete Structures ✓ Contact: embousalem@bu.edu.sa	https://bu.edu.sa/web/embousalem
6	Nagi Z. Mohammed	✓ Associate professor ✓ Surveying ✓ Contact: nzomrawi@bu.edu.sa	https://bu.edu.sa/web/nzomrawi

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7	Amr B. Mohamed	<ul style="list-style-type: none"> ✓ Associate professor ✓ Steel Structures ✓ Contact: d.amro@bu.edu.sa 	https://bu.edu.sa/web/d.amro
8	Ahmed E. Elsaied	<ul style="list-style-type: none"> ✓ Associate professor ✓ Geotechnical ✓ Contact: a.elzoghby@bu.edu.sa 	https://bu.edu.sa/web/a.elzoghby
9	Mohamed M. Elshemy	<ul style="list-style-type: none"> ✓ Coordinator of the Faculty Registration Department ✓ Associate Professor ✓ Environmental Engineering ✓ Contact: melshemy@bu.edu.sa 	https://bu.edu.sa/web/melshemy
10	Ahmed M. Abdelbaki	<ul style="list-style-type: none"> ✓ Associate professor ✓ Water Resources ✓ Contact: aa.ahmed@bu.edu.sa 	https://bu.edu.sa/web/aa.ahmed
11	Khalid A. Alkhuzai	<ul style="list-style-type: none"> ✓ Dean, Faculty of Engineering ✓ Associate Professor ✓ Environmental Engineering ✓ Contact: kalkhuzai@bu.edu.sa 	https://bu.edu.sa/web/kalkhuzai
12	Abbas M. Alshahari	<ul style="list-style-type: none"> ✓ Graduation Projects Committee ✓ Assistant Professor ✓ Structural Engineering ✓ Contact: aalshahari@bu.edu.sa 	https://bu.edu.sa/web/aalshahari
13	Saif E. Eldeen	<ul style="list-style-type: none"> ✓ Coordinator of the Faculty Quality unit ✓ Assistant Professor ✓ Structural Engineering ✓ Contact: sayousef@bu.edu.sa 	https://bu.edu.sa/web/sayousef
14	Salih Y. Arbab	<ul style="list-style-type: none"> ✓ Summer training coordinator ✓ Assistant Professor ✓ Differential Geometry ✓ Contact: sarbab@bu.edu.sa 	https://bu.edu.sa/web/sarbab
15	Abusamra A. Yousif	<ul style="list-style-type: none"> ✓ Assistant Professor ✓ Space Structures ✓ Contact: Ayousif@bu.edu.sa 	https://bu.edu.sa/web/ayousif
16	Sami H. Tagalwi	<ul style="list-style-type: none"> ✓ Assistant Professor ✓ Hydraulic and Engineering Hydrology ✓ Contact: shassan@bu.edu.sa 	https://bu.edu.sa/web/shassan
17	Babikir A. Mobarak	<ul style="list-style-type: none"> ✓ Assistant Professor ✓ GIS and Geomatics Engineering ✓ Contact: bmobarak@bu.edu.sa 	https://bu.edu.sa/web/bmobarak
18	Raed N. Alahmadi	<ul style="list-style-type: none"> ✓ Assistant Professor ✓ Transportation Planning ✓ Contact: rnaif@bu.edu.sa 	
19	Ahmed A. Elbarbary	<ul style="list-style-type: none"> ✓ Assistant Professor ✓ Reinforced Concrete Structures Design ✓ Contact: aelbarbary@bu.edu.sa 	https://bu.edu.sa/web/aelbarbary

#	Name	Information	Web page
20	Mohanned A. Alghamdi	<ul style="list-style-type: none"> ✓ Vice Dean of the Deanship of Quality and Development for Quality and Accreditation Affairs ✓ Assistant Professor ✓ Environmental Engineering ✓ Contact: m.ghamdi@bu.edu.sa 	https://bu.edu.sa/web/m.ghamdi
21	Moustafa H. Saad	<ul style="list-style-type: none"> ✓ Assistant Professor ✓ Reinforced Concrete Structures Design ✓ Contact: M.saad@bu.edu.sa 	https://bu.edu.sa/web/m.saad
22	Abdulelah S. Aljohani	<ul style="list-style-type: none"> ✓ Vice Dean of Engineering College for Postgraduate Studies, Research and Innovation ✓ Assistant Professor ✓ Construction Project Management ✓ Contact: aaljohani@bu.edu.sa 	
23	Mohammed A. Sulaiman	<ul style="list-style-type: none"> ✓ Assistant Professor ✓ Construction Engineering ✓ Contact: msulaiman@bu.edu.sa 	https://bu.edu.sa/web/msulaiman

4.2 Other Teaching Staff

At the beginning of the academic year 1445 AH, there were five scholarship students at Civil engineering department, four of whom were pursuing a doctoral degree and one of whom was pursuing a master's degree.

#	Name	Subspecialty	Degree	Rank
1	Nami A. Alsalamy	Transportation and Traffic Engineering	PhD	Lecturer
2	Youssef R. Almaliki	Water Resources Engineering	PhD	Lecturer
3	Sultan M. Alessa	Structural Engineering	Master	Teaching Assistant
4	Mohammad S. Alshehri	Water Resources Engineering	PhD	Teaching Assistant
5	Ali H. Alghamdi	Structural Engineering	PhD	Teaching Assistant



5. Facilities and Equipment

The Department of Civil Engineering at Al-Baha University provides many classrooms in Aqiq Building number 4 on the 2nd floor with different capacities. There are 31 classrooms with a total capacity of 1054 students. Some halls can accommodate 40-45 students and are considered large halls, and there are medium halls with a capacity of around 30-35 students, and finally, there are small halls with capacities ranging from 20 to 25 students. In addition, the Civil Engineering Department has 6 educational laboratories that allow the student to have practical applications, and thus the student is sufficiently qualified for any practical application of the materials that he studied theoretically. So, besides the theoretical portion, the students are qualified to perform selected lab experiments in different labs of the Department. These laboratories include a Computer Lab, Surveying Lab, Hydraulic Lab, Soil Mechanics Lab, Strength of Materials and Concrete Lab, and Traffic and Transportation Lab.

5.1 Blackboard Learning Platform

Al-Baha University created a learning platform (for online meetings) named RAFID. The study is available as an excellent alternative to in-person study in the event of adverse conditions such as Covid-19 or severe weather conditions. Also, for students to communicate with their professors and download scientific materials or upload the assignments and reports required from them. <https://rafid.bu.edu.sa/webapps/login/>

5.2 Computer Lab

The main purpose of the computer lab is providing exposure to data analysis using a modern computer system, especially the use of graphics. Laboratory components enable students to learn computer programs like AutoCAD in which the student can accurately draw structural elements through engineering drawing courses.



5.3 Surveying Laboratory

Surveying is associated with estimating some sort of measurement to determine the location of points to produce maps, or layout such points. Surveying can be related to all civil engineering branches such as building, roads constructing, water resources, irrigation, drainage engineering ... etc. in all steps of data acquisition and planning, designing, execution, and monitoring. The laboratory component of surveying engineering courses represents an integral part of the theoretical component. It combines theory with practice. In addition of giving the students a valuable chance to perform on-site type of work. Moreover, it enhances the students' self-confidence to work in the field. Finally, it assists the students to improve their skills in teamwork and leadership skills.



5.4 Fluid Mechanics and Hydraulics Laboratory

The Hydraulics Course is one of the main courses in Civil Engineering. Hydraulics Lab is concerned with the practical applications of fluids, primarily flowing water. The lab allows the students to perform several experiments that are outlined in the course specification. The students would design closed and open conduits water systems such as transmission lines, pumping stations, and open channels and select suitable hydraulic machines such as pumps and turbines based on the required hydraulic design.



5.5 Soil Mechanics Laboratory

Soil is the material that supports the foundation of all structures. It is also used as a construction material for civil engineering works. Knowledge of the physical and mechanical properties of soil is significant. Laboratory soil engineering courses represent an integral part of theoretical studies. The main objective of the lab is to relate theory with practice. The student will be qualified to perform experimental lab work.



5.6 Strength of Materials and Concrete Laboratory

Concrete Laboratory is one of the major laboratory tools used to evaluate concrete structures' performance and establish compliance with the quality of concrete. The students would become familiar with the nature and properties of concrete materials by conducting laboratory tests. It gives the students a valuable chance to do real work. Moreover, it enhances the students' self-confidence to work in the field.



5.7 Traffic and Transportation Laboratory

The lab is concerned with the characteristics of highway materials including soil, aggregate, asphalt, and hot asphalt mixtures. The main objective of this lab is to enable students to critically evaluate the characteristics of highway materials by running the appropriate experimentation and designing the flexible pavement structure. The laboratory of highway material represents an integral part of the theoretical component of the course of highway materials and pavement design. It gives the students a chance to run the experiments by themselves and gain self-confidence to work in the field.



6. Students' Academic Counseling

Civil Engineering Department seeks offering all that supports students' educational journey, given the importance of following up on student/student academic affairs with a scientifically proven positive impact on their academic achievement and performance. It is keen to invest in academic competencies at the various academic levels at the university. The main objective of the academic advising system is to link the students to the university with the appropriate academic advisor who enables them to obtain assistance and guidance to support their academic careers.

6.1 Advisor-Student Relationship

Academic Advising is continuous communication between the students and the academic advisor to ensure their smooth progress in the scientific program and the achievement of their desired goals. The advising process helps students to overcome the academic difficulties they may encounter during their academic careers. It is a task assigned to faculty members or administrators in colleges through guidance, and advice, including introducing them to the academic regulations and systems and helping them develop their capabilities. In addition, academic advising supports the students to overcome any obstacles that may negatively affect their academic level through the following:

1. Support the new students at the university to adapt to the new university life in full flow.
2. Introducing the university's rules and regulations, academic requirements, how to apply and deal with them, as well as the existing actual and virtual services.
3. Continuous support for the students at the university to develop their academic skills and raise them to the required levels.
4. Encouraging and supporting distinguished and outstanding students to become more distinguished.
5. Supporting students who have low academic levels to overcome difficulties and obstacles, by searching for causes and helping them to deal with them.
6. A stumbling block between weak student abilities, failure in academic achievement, and academic withdrawal and dropout.
7. Striving to achieve quality in the academic process by providing complementary services to students at the university and graduating qualified cadres from all scientific and practical aspects.

6.2 What is the Advisor's Responsibility?

1. Conducting an introductory meeting that includes the head of the department and members, in addition to the department's students, to enhance the culture of academic advising among students and to provide the service to those who need it, even if they do not request it.
2. The academic advisor prepares a file for each student that includes the following: an updated form containing all the student's data to communicate with him and follow up on his academic record, a copy of the academic record, a copy of the student's semester schedule, and a copy of any decision taken against the student.
3. The academic advisor must abide by the rules and regulations followed in the department when registering for any course for the students.
4. The academic advisor should hold a periodic meeting in the middle of the semester with his students to get acquainted with the proper functioning of the academic process and to solve any problem.
5. Paying attention to students with low grades by knowing, and addressing the causes, to guide them for raising their level of achievement.
6. Proposing a study schedule for each student before the start of registrations and educating the student about the need to adhere to the proposed schedule.
7. Help the student to solve the registration problems such as (changing a section to remove conflict of time, raising a capacity of a section to add new students if needed, and requesting to remove the department constraints when registering for equivalent courses in other departments)
8. After the initial registration process, the academic advisor must review the final schedule for each of his students and figure out the students who need help.
9. The academic advisor has an individual meeting in his office with each student who has a problem with his registration.
10. The academic advisor treats the registration problems such as adding or removing any course from the schedule by filling out the required form.
11. The academic advisor must provide his students with his schedule and inform them of his available office hours for academic advising.
12. Encouraging and supporting outstanding students to complete their higher studies.
13. Encouraging and supporting students with special needs and disabilities to continue their academic careers.
14. Urging students to attend and participate in the activities and workshops that are held within the university, which are provided by experts and specialists.

15. Urging students to participate in community volunteer fields, extracurricular activities, and competitions that represent the college and university.
16. The student's participation in thinking about the career opportunities available to the graduates of the program.

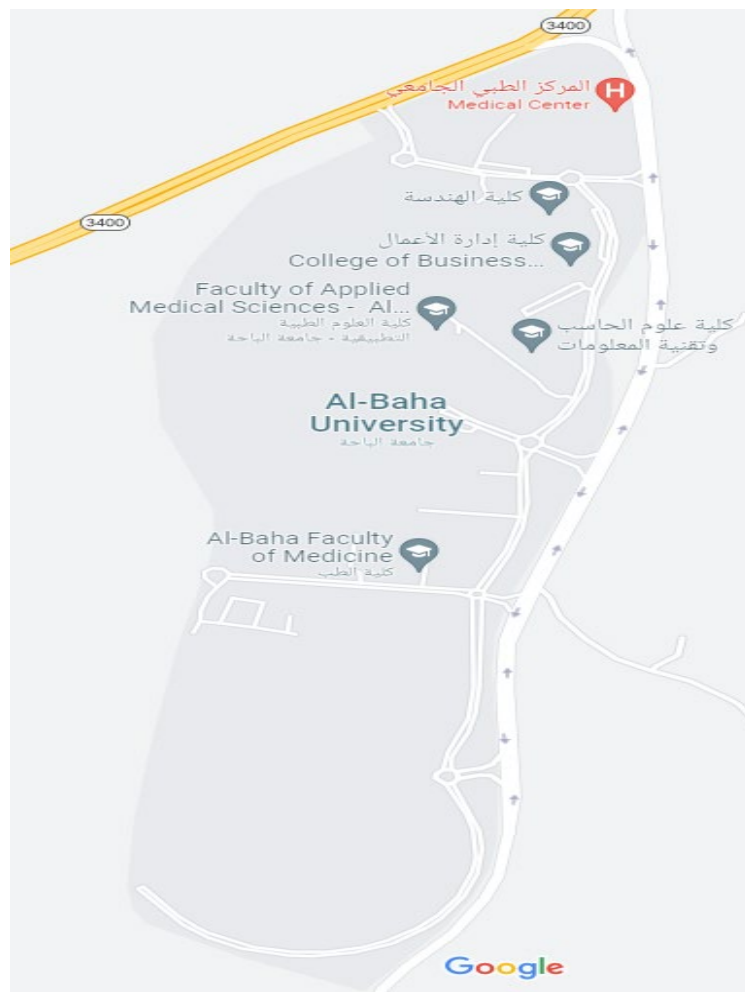
6.3 What is the Student's Responsibility?

1. During the course registration process, the student must add the proposed courses by his academic advisor to his schedule according to his study plan through the banner system, where all the courses available for registration appear on his account that does not conflict with his schedule and passed their prerequisites courses.
2. The student's schedule cannot exceed the maximum and minimum number of credit hours allowed for registration after the adding process.
3. Once the course registration is complete, the student should email a copy of their schedule to their academic advisor using their university email.
4. To receive assistance, students are encouraged to schedule appointments with their academic advisors during set office hours to address their concerns.

7. Rules, Regulations, and Important Information for Faculty Staff and CIVE Students

7.1 Al-Baha University

Al-Baha University is a public university located in the city of Al-Baha, Saudi Arabia. It was established in 2006 and offers undergraduate and graduate programs in various fields such as engineering, medicine, business, education, and humanities. The university has several faculties including the Faculty of Engineering, Faculty of Medicine, Faculty of Science, Faculty of Education, and Faculty of Arts and Humanities. The university also has research centers such as the Center for Research and Consultation Services and the Center for Innovation and Entrepreneurship. The campus is equipped with modern facilities including libraries, laboratories, sports facilities, and faculty housing. Al-Baha University aims to provide quality education to its students while promoting research and community service. More information about Al-Baha University may be found at <https://bu.edu.sa/en/about>



7.2 University Regulations

Regulations are a set of rules and guidelines that are established by an authority to ensure compliance and order. In the context of universities, regulations are put in place to govern the conduct of students, faculty, staff, and other stakeholders within the institution. These regulations cover a wide range of areas such as academic policies, student behavior, campus safety, research ethics, and financial management.

Regulations for Al-Baha University are essential to maintain the integrity and reputation of the institution. They provide a framework for ensuring that all activities within the university are conducted fairly and ethically. Regulations also help to protect the rights and interests of students, faculty, staff, and other stakeholders.

In addition to the legal requirements, Al-Baha University may also have internal regulations that govern its operations. These regulations may be established by the university's governing board or by individual departments or units within the institution.

Overall, regulations play a critical role in ensuring that Al-Baha University operates ethically and responsibly. By adhering to these regulations, Al-Baha University can maintain its reputation as an institution of higher learning that provides quality education while upholding high standards of conduct and accountability. More information about Al-Baha University Regulations may be found at <https://bu.edu.sa/en/web/policies-and-guidelines>

7.3 Admission and Graduation Requirements

The Deanship of Admission and Registration is a crucial department at Al-Baha University. It is responsible for managing the admission process of new students, maintaining students' records, and ensuring that students meet the academic requirements to graduate. The deanship also handles the registration process for courses and exams, manages student transfers, and provides academic advising services. The deanship plays a vital role in maintaining the academic integrity of an institution by ensuring that all students meet the necessary standards for admission and graduation. It also serves as a liaison between students, faculty, and administration to ensure that all parties are informed about academic policies and procedures. More information about Al-Baha University Admission and Graduation requirements may be found at <https://bu.edu.sa/en/web/deanship-of-admission-and-registration/students-guides>

7.4 The Transition From Another Program

Transferring from one college to another or program to another is a common occurrence for many students. There are various reasons why students choose to transfer, including academic, financial, or personal reasons. It is important for students to carefully consider their options and make informed decisions when transferring colleges. Al-Baha University allows its students this option, but according to conditions that can be found at <https://bu.edu.sa/en/transfer>

8. Civil Engineering Program

8.1 History of Study Plan Development

The study plan of the department has been designed to cover all aspects of civil engineering and provide the graduate with sufficient knowledge to be qualified to work in all of these disciplines. The department witnesses a great turnout of students joining the Faculty of Engineering, due to its good reputation, teaching competencies, and great ability to qualify students for the labor market.

8.2 Current (B.Sc.) Study Plan (1445 AH Study Plan)

Level	Course Code	Course Title	Pre-Requisite Courses	Credit Hours	Type of requirements
Level 1 12 Hours	CS1002	أساسيات التحول الرقمي	NA	2	Institution
	ISLM1003	Quran Kareem	NA	2	Institution
	ENGL1001	English Language 1	NA	0	Faculty
	CHEM1004	General Chemistry	NA	4	Faculty
	MATH1004	Calculus 1	NA	4	Faculty
Level 2 13 Hours	ISLM1001	Islamic Culture 1	NA	2	Institution
	ARAB1001	مهارات لغوية	NA	2	Institution
	ENGL1002	English Language 2	ENGL1001	3	Faculty
	MATH1005	Calculus 2	MATH1004	4	Faculty
	MENG1003	Engineering Drawing	NA	2	Department
Level 3 11 Hours	ISLM1002	Islamic Culture 2	NA	2	Institution
	HIST1001	تاريخ المملكة العربية السعودية	NA	2	Institution
	ENGL1003	English Language 3	ENGL1002	3	Faculty
	PHYS1003	General Physics 1	NA	4	Faculty
Level 4 12 Hours	MENG1005	Engineering Economics	NA	2	Department
	CENG1003	Computer Programming	NA	4	Faculty
	ENG1256	Applied Algebra	MATH1005	4	Department
	CIVE1002	Building Construction	MENG1003	2	Department
Level 5 12 Hours	EENG1254	Basics of Electrical Engineering	PHYS1003	3	Department
	CIVE1001	Statics	NA	3	Department
	ENG1257	Applied Differential Equations	MATH1005	4	Department
	CIVE1003	Tech. Writing & Research Meth.	NA	2	Department

Level	Course Code	Course Title	Pre-Requisite Courses	Credit Hours	Type of requirements
Level 6 12 Hours	CIVE1004	Dynamics	CIVE1001	3	Department
	CIVE1257	Civil Engineering Drawing	MENG1003	3	Department
	CIVE1258	Engineering Design	CENG1003	3	Department
	MENG1258	Probability and Statistics	MATH1005	3	Department
Level 7 13 Hours	CIVE1259	Structural Analysis 1	CIVE1001	3	Department
	CIVE1260	Strength of Materials	CIVE1001	4	Department
	CIVE1261	Engineering Geology	NA	2	Department
	CIVE1262	Fluid Mechanics	CIVE1004	3	Department
Level 8 12 Hours	CIVE1516	Structural Analysis 2	CIVE1259	3	Department
	CIVE1263	Surveying 1	ENG1256	3	Department
	CIVE1517	Hydraulics	CIVE1262	3	Department
	MENG1518	Numerical Analysis	ENG1257	3	Department
Level 9 12 Hours	CIVE1518	Surveying 2	CIVE1263	3	Department
	CIVE1519	Traffic and Transportation Eng.	MENG1258	3	Department
	CIVE1520	Concrete Technology	CIVE1260	3	Department
	CIVE1521	Environmental Engineering	CHEM1004 & CIVE1517	3	Department
Level 10 13 Hours	CIVE1522	Reinforced Concrete 1	CIVE1259 & CIVE1260	4	Department
	CIVE1523	Steel Structures 1	CIVE1259 & CIVE1260	4	Department
	CIVE1524	Geotechnical Engineering 1	CIVE1260 & CIVE1261	3	Department
	ENG525	Profession Ethics		2	Faculty
Level 11 13 Hours	CIVE1527	Reinforced Concrete 2	CIVE1522	4	Department
	CIVE1528	Hydrology	CIVE1517	3	Department
	CIVE1529	Geotechnical Engineering 2	CIVE1524	3	Department
	CIVE1530	Geometric Design of Roads	CIVE1519	3	Department
Level 12 13 Hours	CIVE1531	Water Supply Engineering	CIVE1517	3	Department
	CIVE1532	Steel Structures 2	CIVE1523	4	Department
	CIVE1533	Project Management	MENG1005	3	Faculty
	CIVE1793	Water Resources Engineering	CIVE1528	2	Department
	CIVE1797	Intro. to Graduation Project	Passing 123 Credit Hours	1	Department
Summer term 2 hours	SINT1751	Field Training	Passing 12 level	2	Faculty
			Passing 110 Credit Hours.		

Level	Course Code	Course Title	Pre-Requisite Courses	Credit Hours	Type of requirements
Level 13 12 Hours	CIVE1791	Foundation Engineering	CIVE1522 +CIVE1529	4	Department
	CIVE1790	Highway Mater. & Pav. Design	CIVE1519 & CIVE1524	3	Department
		Elective Course (1)	NA	3	Department
		Elective Course (2)	NA	3	Department
Level 14 11 Hours	CIVE1792	Wastewater Engineering	CIVE1517	4	Department
	CIVE1795	Construction Engineering	CIVE1533 + CIVE1002	3	Department
	CIVE1798	Graduation Project Part 1	CIVE1797	1	Department
		Elective Course (3)	لا يوجد	3	Department
Level 15 12 Hours	CIVE1796	Hydraulic Structures	CIVE1517	4	Department
	CIVE1799	Graduation Project Part 2	CIVE1798	2	Department
	CIVE1794	Contracts, Specs & Quantities	CIVE1527	3	Department
		Elective Course (4)	NA	3	Department

Elective courses available within the program are listed as follows:

#	Course Title	Source Code	Credit Hours	Pre-Requisite Courses	Type of requirements
Structural Engineering					
1	Design of RC Bridges	CIVE1801	3	CIVE1527	Department
2	Design of RC Water Tanks	CIVE1802	3	CIVE1527	Department
3	Comp. App. in Structural Eng.	CIVE1803	3	CIVE1522	Department
4	High Rise Buildings	CIVE1804	3	CIVE1516	Department
5	Advanced RC Design	CIVE1805	3	CIVE1527	Department
6	Prestressed Concrete	CIVE1806	3	CIVE1527	Department
7	Design of Steel Bridges	CIVE1807	3	CIVE1532	Department
Concrete Technology					
1	Advanced Concrete Technology	CIVE1808	3	CIVE1520	Department
2	Rehabilitation of Concrete Structures	CIVE1809	3	CIVE1520	Department
3	Selected Topics in Structures	CIVE1810	3	CIVE1516	Department

#	Course Title	Source Code	Credit Hours	Pre-Requisite Courses	Type of requirements
Transportation Engineering					
1	Transportation Planning	CIVE1811	3	CIVE1519	Department
2	Transportation and Logistics	CIVE1812	3	CIVE1519	Department
3	Airports Design	CIVE1813	3	CIVE1519	Department
4	Computer Applications in Transportation	CIVE1814	3	CIVE1530	Department
Survey Engineering					
1	GPS Applications	CIVE1815	3	CIVE1518	Department
2	Remote Sensing applications	CIVE1816	3	CIVE1518	Department
3	GIS Applications	CIVE1817	3	CIVE1518	Department
4	Selected Topics in Transportation and Surveying	CIVE1818	3	CIVE1519 & CIVE1518	Department
Geotechnical Engineering					
1	Advanced Soil Mechanics	CIVE1819	3	CIVE1529	Department
2	Soil Improvement.	CIVE1820	3	CIVE1529	Department
Water Resource Engineering					
1	Irrigation and Drainage Engineering	CIVE1821	3	CIVE1517	Department
2	Ground Water Engineering	CIVE1822	3	CIVE1517	Department
3	Computer Applications in Water & Environmental Engineering.	CIVE1823	3	CIVE1517	Department
4	Harbor Engineering	CIVE1824	3	CIVE1517	Department
5	Water Desalination	CIVE1825	3	CIVE1517	Department
Environmental Engineering					
1	Wastewater Disposal	CIVE1826	3	CIVE1792	Department
2	Municipal Solid Waste Disposal and Treatment	CIVE1827	3	CIVE1792	Department
3	Selected Topics in Water and Environment	CIVE1828	3	CIVE1517	Department
1	Construction Project Control	CIVE1829	3	CIVE1533	Department
2	Construction Planning and Scheduling	CIVE1830	3	CIVE1533	Department
Cooperative Training					
1	Cooperative Training 1	COOP1801	3	Pre-Req: SINT1751 (Co-Req: COOP1801	Department
2	Cooperative Training 2	CIVE1828	3	Pre-Req: SINT1751 Co-Req: COOP1801	Department

#	Course Title	Source Code	Credit Hours	Pre-Requisite Courses	Type of requirements
Construction Engineering					
1	Construction Project Control	CIVE1829	3	CIVE1533	Department
2	Construction Planning & Scheduling	CIVE1830	3	CIVE1533	Department

8.3 Current (M.Sc.) Study Plan

The Civil engineering department offers a M.Sc. program in Engineering Management a graduate-level program that combines the principles of engineering and construction management. It was established 1442 AH and designed to equip students with the skills and knowledge to manage complex engineering projects, teams, and organizations.

The program typically covers project management, financial management, leadership, strategic planning, operations management, quality control, and risk assessment. Students also learn about the legal and ethical aspects of engineering management. Graduates of a master's program in engineering management can pursue careers as project managers, operations managers, technical directors, consultants, or entrepreneurs. They can work in various industries such as manufacturing, construction, energy, transportation, healthcare, and technology. The duration of the program typically takes two years to be completed. The curriculum may include coursework as well as research projects. For more information visit this link <https://bu.edu.sa/en/web/deanship-of-graduate-education/guidelines>

• **First Path of (M.Sc.) Study Plan (Project Track)**

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours
Level 1	MEM60103	Advanced Engineering Economy	Required	-	3
	MEM60102	Management for Engineers	Required	-	3
Level 2	MEM60205	Applied Engineering Optimization	Required	-	3
	-	Elective Course 1	Elective	-	3
Level 3	MEM60101	Statistical Analysis of Engineers	Required	-	2
	MEM60306	Engineering Project Management	Required	Management for Engineers	3
Level 4	-	Elective Course 2	Elective	-	3
	MEM60104	Research Methods and M. Sc. Seminar	Required	-	1
	MEM60307	Project Cost Estimation	Required		3
Level 5	MEM60408	Project Planning and Control	Required		3
	MEM60409	Risk Management and Innovation	Required		3
Level 6	-	Elective Course 3	Elective	-	3
	PROJ60001	Research project	Required	After Level 4 with 21 earned hours	3
Total		13			36

- **Second Path of (M.Sc.) Study Plan (Thesis Track)**

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours
Level 1	MEM60103	Advanced Engineering Economy	Required	-	3
	MEM60102	Management for Engineers	Required	-	3
Level 2	MEM60205	Applied Engineering Optimization	Required	-	3
	-	Elective Course 1	Elective	-	3
Level 3	MEM60101	Statistical Analysis of Engineers	Required	-	2
	MEM60306	Engineering Project Management	Required	Management for Engineers	3
Level 4	MEM60104	Research Methods and M. Sc. Seminar	Required	-	1
	MEM60307	Project Cost Estimation	Required	-	3
Level 5	-	Elective Course 2	Elective	-	3
	-	Elective Course 3	Elective	-	3
Level 6	THES60002	Thesis	Required	After Level 4 with 21 earned hours	6
Total		11			33

Elective courses available within the program are listed as follows:

No.	Course Code	Course Name	Credit Hours	Pre-request
1	MEM60212	Safety Engineering Management	3	-
2	MEM60213	Engineering Design, Methodology & Applications	3	-
3	MEM60214	Product Innovation and Design Management	3	-
4	MEM60215	Artificial intelligence: Reasoning and decision-making	3	-
5	MEM60316	Decision support system	3	-
6	MEM60317	Principal of supply chain management	3	-
7	MEM60318	Infrastructure project finance and management	3	-
8	MEM60319	Strategic Management	3	-

9. Courses and Course Descriptions

9.1 Course Description For (B.Sc.)

Quran Kareem- ISLM10003

The course includes eleven topics, namely: the definition of the Qur'an, its virtues, the etiquette of its recitation, the rulings on seeking refuge with Allah, the basmalah, the singing, the rulings of the noun sakna and tanween, the rulings of the static meem, the rulings of the extended, the Qalqalah, the exaltation, the tareeqah, the hamzat al-wasl and al-qat'.

English (1) - ENGL1001

This course prepares first-year students to communicate, exchange information, and interact successfully in real-life situations. It also builds cultural awareness and develops A1 & A2 levels of proficiency. This student-centered course covers all language skills and focuses on the most effective way to progress in English.

General Chemistry - CHEM1004

This course is the first-semester course in the General Chemistry sequence that provides a thorough foundation of chemical principles. This course is appropriate both as an introductory course for chemistry and other science majors as well as an introductory and terminal course for non-science majors who desire a foundation in chemical principles. The course may contain the fundamentals of Matter, the Structure of the atom, the Periodic Table, Electron Configurations, Chemical Substances, The Mole Concept, Chemical Reactions, Chemical bonding, States of Matter, Gaseous state, Liquid state, Solid state, Acids, and Bases, as well as an introduction to organic chemistry.

Calculus 1- MATH1004

This course introduces the student to the basic concepts and method of calculus, including real numbers and inequalities - main properties of functions - domain, and range of functions - inverse functions - combination of functions and composition of functions - types of functions, and the theory of equation - properties of limits and limits of polynomial and rational functions - one-sided limit limits involving infinity - limits of trigonometric functions - limits and continuity – definition of derivation - basic techniques of derivatives - derivatives of the trigonometric functions - chain rule - implicit differentiation - derivatives of the inverse of the trigonometric functions -derivatives of the logarithmic, exponential, hyperbolic, inverse hyperbolic, parametric functions - higher order derivatives - Leibniz formula.

Islamic Culture (1) (Islamic Morality)- ISLM10001

The course includes nine topics: the concept of Islamic culture and morals, the sources of Islamic morals, their characteristics, their connection to belief and worship, methods of formation and protection, and some examples of virtuous morals.

English (2) – ENGL1002

It is a goals-based English language course that prepares first-year students to interact successfully in real-life situations. It aims to provide them with rich, high-frequency vocabulary and explicit grammar syllabi to achieve such goals. It also builds cultural awareness and develops B1 and B2 levels of proficiency across the four skills via the explicit presentation of grammar, vocabulary, reading texts, and social exchange in conversations and listening activities related to general topics.

Calculus 2- MATH1005

This course introduces the student to the basic concepts and method of integration, including applications of derivatives: Linear Approximation, L’ Hospital’s rule, maximum and minimum values, extrema, the mean value theorem - partial differentiation and its Engineering Applications: Basic definitions, second and higher partial derivatives, increments and differentials, chain rule in partial differentiation - definite and Indefinite Integrals: Integration rules - methods of integration: Introduction, Simple substitution (Change of variables), removing roots, integration involving power sine and cosine, integration by parts, successive reduction - applications of definite Integrals: Area of a region enclosed between two curves, volume of solids, the arc length of a plane curve.

Engineering Drawing - MENG1003

This course includes Knowledge and mastery of engineering drawing methods and terminology, to identify the types of lines, deducing the third projection from two given projections, dimensioning techniques, and the derivation of various sections.

Islamic Culture (2) (Islamic Civilization)- ISLM10002

The course includes nine topics: the concept of civilization and the factors of its emergence, the conditions of the Arabs before Islam, the origins of the Islamic civilization, its characteristics, impact and manifestations, and the impact of Islamic civilization on the East and Europe and the means of its spread.

English Language 3 – ENGL1003

This course prepares first-year students to communicate, exchange information, and interact successfully in real-life situations. It also builds cultural awareness and develops B2 level of proficiency. This student-centered course covers all language skills and focuses on the most effective ways to progress in English.

General Physics 1- PHYS1003

This course includes recognizing the concepts of units, dimensions, and vectors. In addition of Stating the different kinds of motion including one-dimension and two-dimension motion, and the laws that govern them. Illustrate the basic principles of fluid mechanics, memorize the reflection and refraction of light using different optical devices, and summarize the elastic inelastic properties of solids.

Engineering Economics – MENG1005

This course includes Introduction to engineering economy, the time value of Money, analysis of break-even point (BEP), assessment of the benefit/cost, decision-making and the choice between alternatives, laws of return, and the effective Rate of return (ERR), economic analysis, replacement policy, depreciation rates, fundamentals of inflation and introduction to cost accounting.

Computer Programming - CENG1003

The course includes Introduction to Computers, Learning C++ programming language, Elementary C++ Programming, Selection Statements, Loops, Introduction to Arrays, and File Input/output.

Applied Algebra – ENG1256

This course introduces the student to the basic concepts and methods of calculus, including Complex numbers and Complex plane: complex numbers and their properties, complex plane, polar form of complex numbers, powers and roots, sets of points in the complex plane - Matrices and Linear Systems: Properties of matrices, Gauss-Jordan reduction, Inverse of a matrix, Determinants, and linear systems, Eigen values and Eigen vectors - Infinite Series: Binomial series, Sequences, Basic theorem in series, Tests of convergence of series, Alternating series, Absolute and conditional convergence, Power series, Maclaurin and Taylor - Vectors in Two and Three Dimensional Spaces: Scalar and vectors, Unit vector, Properties of vectors, Cosine and direction ratios, Dot product, Cross product. Equations of a straight line in space, Equation of a plane in space – Analytic geometry: Geometric interpretation of the circle, ellipse, parabola, hyperbola, and quadratic equations in two variables.

Building Construction – CIVE1002

The course includes: Traditional and modern construction Systems, building joints / walls Construction of different types / brick walls systems Flemish and English / bearing walls and skeleton / double Wall. Study of simple and conventional foundations / continuous foundations / separate foundations / raft foundations. The sequence of building implementation work.

Basic of Electrical Engineering - EENG1254

This course includes systems of electrical units, Basic DC circuit elements, and concepts; Electrical quantities; DC circuits; Basic laws of circuit theory: Ohm's law, Current divider, Voltage divider, Kirchhoff's current law (KCL), Kirchhoff's voltage law (KVL); AC circuits; Sinusoidal sources and the concept of phasor in circuit analysis; Phasor Relationships for R, L, and C; Kirchhoff's Laws in phasor domain; Introduction to the concepts of average power, reactive power, complex power, and power factor.

Statics – CIVE1001

This course includes: Evaluation of the equilibrium condition of a particle under static forces and calculation of their resultant - Determination of equivalent systems of forces acting on rigid bodies - Development of equilibrium equations, definition of supports types and calculations of supports reactions - Calculation of member forces in plane truss systems - Calculation of internal forces of frame members - Calculation of the centroids and moment of inertia of plane areas - Definition of the concept of friction, evaluation of the balanced condition of rigid bodies under static loads and friction force.

Applied Differential Equations – MATH1257

Introduction, Basic definitions and types of solutions - First Order ODE:(Standard form of first-order ODE, Separable ODE, Homogeneous ODE, ODE reducible to separable or Homogeneous ODE, Exact ODE, ODE reducible to exact, Linear first order ODE, Bernoulli ODE, Orthogonal trajectories) - Higher Order ODE: (the method of reduction of order, Theory of linear homogeneous second order ODE, Homogeneous linear second order ODE with constant coefficients, Higher order ODE, The general Linear equations with constant coefficients, Non-homogeneous linear ODE, The method of undetermined coefficients, Annihilator Approach. Cauchy-Euler's ODE. The method of variation of parameters, Linear Systems of ODE's)- Series Solution of Linear ODE: (Power series solution about both an ordinary and singular points, Taylor series method) - Laplace transformation: (definition of the Laplace transformation, inverse transformation, and transformation of derivatives. Applications to the ordinary differential equations).

Tech. Writing & Research Meth. CIVE1003

This course includes the basics of technical reports writing, types and structure of technical reports, technical writing guidelines, effective tables, graphs and presentations.

Dynamics – CIVE1004

This course includes: the study of kinematics and the kinetics of particles (linear and curvilinear motion).

Civil Engineering Drawing – CIVE1257

This course includes: AutoCAD 2D commands and tools used to draw some civil engineering 2D drawings such as reinforced concrete and reinforcement detailing of some structural elements.

Engineering Design CIVE1258

This course introduces active learning, teamwork, team dynamics, team norms, and communication, conducting effective meetings and quality assessment, problem-solving procedures, problem definition, generation of solutions, selection methodology, solution implementation, assessment of implementation, levels of learning, and degrees of internalization, ethical decision, organization of the work and design notebook, reverse engineering, and design projects.

Probability and Statistics – MENG1258

This course includes: Introduction to engineering statistics, Applications of statistics, Types of statistics, Statistical population and statistical sample, Types of data (Quantitative Data and Qualitative Data), Data Description and Representation: (Graphical Representation of Data: Frequency Distribution, Histogram, frequency polygon, The cumulative frequency graph, Line graph, Ogive graph, Pareto Chart, Stem-and-leaf display, Bar and Pie Charts, five-number summary and Box plot) and (Numerical Description of Data: Measures of Central Tendency and Dispersion). An Introduction to probability: a review of Sets, Random Experiments, Sample Space and Events, Venn diagrams, Probability of event, Some important theorems of Probability, Conditional probability, and Bayes` Theorem. Random variables and probability distributions, discrete and continuous random variables, Probability function, Expectation, Variance, and Standard Deviation for a random variable.

Structural Analysis 1 – CIVE1259

This course includes Classification of structures, loads, and supports - stability and degrees of indeterminacy - Calculation of supports reactions for statically determinate structures - Calculation and drawing diagrams of internal forces for statically determinate beams and frames. Analysis of statically determinate trusses - Deflection of statically determinate beams using double integration method and conjugate beam method - Influence lines of beams.

Strength of Materials – CIVE1260

This course includes Types of loadings, a review of reactions, stress, strain, displacement, shearing, bending, and twisting stresses, and a graphical representation of shearing, bending, and twisting stresses.

Engineering Geology – CIVE1261

Introduction. Structure of Earth. Minerals and Rocks. Igneous Rocks and Volcano. Weathering, erosion, and soil formation. Sedimentary Rocks. Metamorphic Rocks. Engineering geological maps and their applications. Site investigation. Geology of Saudi Arabia

Fluid Mechanics – CIVE1262

Systems of units and dimensions - properties of fluids - Fluid statics - Fluid kinetics - Applications of continuity, energy, and momentum in equations of fluid flow.

Structural Analysis 2 – CIVE1516

This course includes the deformations of statically determinate structures using virtual work methods - Methods of solving statically indeterminate structures - Three-moment equation - Consistent deformation method - Moment distribution method - Slope deflection method - Settlement of supports.

Surveying 1 – CIVE1263

This course includes Definition and types of surveying – Distance Measurement - Angle measurement – Bearing - Control surveying and Traverse - Area computation and division – Levelling and its applications.

Hydraulics – CIVE1509

This course discusses Flow and losses in pipes - pipe system analysis and design - hydraulic machines - flow in open channels - open channels flow measurement and design.

Numerical Analysis – MENG1518

This course includes General introduction, generation and propagation of errors, and stability. Numerical solution for nonlinear equations, Newton-Raphson method, numerical solution for the system of linear equations. Interpolation and the Lagrange polynomial, Newton forward method, Newton backward method. Numerical integration, trapezoidal rule, Simpson's rule, and its error. Solution of the ordinary differential equation (initial value problems), Euler's method, error control, Taylor expansion method, Runge-Kutta method for difference orders, error studies, and convergent conditions.

Surveying 2 – CIVE1518

Horizontal and vertical curves, methods of setting out, area and volume computation, introduction to GPS and photogrammetry.

Traffic and Transportation Eng. – CIVE1519

An initial course in the field of traffic and transportation engineering, which covers the following main topics: Modes of transportation, transportation system, human and vehicle characteristics, traffic studies, road capacity & level of service, and traffic control.

Concrete Technology – CIVE1520

This course includes the basic principles of concrete materials, types, and tests - Properties of concrete ingredients - Manufacturing processes of concrete - The main properties of fresh and hardened concrete - Principles and design methods of concrete mixes - Properties and applications of special types of concrete.

Environmental Engineering – CIVE1521

This course includes fundamentals of Environmental Engineering, Water Quality Management, Climate Change Impacts, Environmental Impact Assessment of Engineering Projects, Solid Waste Management, Air Pollution & Noise Pollution Control.

Reinforced Concrete 1 – CIVE1522

Analysis and design of singly reinforced concrete rectangular and T-sections for flexure - Analysis and design of doubly reinforced concrete sections for flexure - Design of beams for shear and torsion - Details of reinforcement - Design methods and other related topics required by the Saudi Building Code and the American Concrete Institute Code.

Steel Structures 1- CIVE1523

This course includes Introduction to steel constructions - General layout of steel trusses - Tension members - Short slender column under axial loads – Beams - Beam-columns Related topics required by Saudi Building Code Requirements (SBC301, SBC306) and the American Institute of Steel Construction Specifications (AISC ASD and LRFD SI, 2010).

Geotechnical Engineering 1 – CIVE1524

An initial course in soil mechanics which covers the Physical and Mechanical Properties of soil including soil formation, weight-volume relationships. Physical properties of soil which include water content, unit weight, specific gravity, voids ratio, porosity, degree of saturation ...etc. Mechanical analysis of soil- sieve analysis - consistency of soil (Atterberg limits), Engineering classification of soil. Hydraulic conductivity of soil, In Situ Stresses in Saturated soil and Concepts of Effective Stress, and Permeability of Soil.

Profession Ethics- CIVE1525

This course includes concepts of Engineering Ethics, Ethics of the profession in the Saudi regimes, International Engineering Codes of Ethics, and case studies.

Reinforced Concrete 2 – CIVE1527

This course includes Introduction - Reinforced concrete used in one-way and two-way slabs - Solid and ribbed structural slab systems - Compression members - Axially-loaded columns - Eccentrically-loaded columns - short and long columns - Slab-type and cantilever-type stairs. Design methods and other related topics are required by the Saudi Building Code and the American Concrete Institute Code.

Hydrology – CIVE1528

This course includes fundamentals of hydrology and advanced elements of the hydrologic cycle - groundwater and precipitation.

Geotechnical Engineering 2 – CIVE1512

This course includes: Compressibility of Soil, consolidation theory and consolidation settlement analysis, secondary compression, methods of predicting soil settlements. Settlement of Shallow Foundations: immediate or elastic settlement and consolidation settlement calculations. Shear strength of soils: determination of shear strength parameters, and calculation of Lateral earth pressure.

Geometric Design of Roads – CIVE1530

Topics include Design controls and criteria, Route selection, Cross-sectional elements, Sight distances, Horizontal and Vertical alignments, and At-grade Intersections.

Water Supply Engineering – CIVE1531

This course includes Quality of water - Drinking water treatment - Water supply systems - Water usage and demand assessment - Water supply sources - Design of water supply systems - Design of water supply systems using the Water CAD program.

Steel Structures 2 – CIVE1532

This course includes Introduction to steel frames constructions - Planning of general layout - Welded and bolted connections for trusses - Beam-column under eccentric, and biaxial loads - Eccentric connections - Composite members - Related topics required by Saudi Building Code Requirements (SBC301, SBC306) and the American Institute of Steel Construction Specifications (AISC ASD and LRFD SI, 2010).

Project Management – CIVE1533

This course includes Fundamentals of the Project Management Techniques, Professional hands-on training for scheduling, controlling, and evaluation of project completion time, Resources allocation, and crashing procedures, and built a natural acquaintance with Project Management software packages.

Highway Mater. Pavement Design– CIVE1790

The topics of this course includes: Pavement types, design factors, stress and strain in flexible pavement, road materials characterization, asphalt mix design, estimation of design traffic, determination of layers thicknesses, introduction to computer application in pavement design.

Foundation Engineering – CIVE1791

This course includes Introduction - Site investigation - Bearing capacity of shallow foundations - Types of foundations - Design of shallow foundations - Single pile capacity - Related topics required by the Saudi Building Code and the American Concrete Institute Code.

Wastewater Engineering – CIVE1792

This course includes the following: Properties and sources of wastewater - Initial studies for designing drainage projects - types of drainage systems - planning and design of both sewage and storm water networks - Sewage Treatment. Design of sewage system using Sewer CAD program.

Intro. To Graduation Project Part – CIVE1797

This course includes: Choosing the project topic- establishing the project - literature review - preparing for/or preliminary conducting the experiments - collecting the required field or Lab. data - developing the mathematical / computer model if applicable - writing the first part of the project along with any preliminary findings.- presenting and defending the project.

Water Resources Engineering – CIVE1793

This course includes fundamentals water resources Engineering; Reservoir capacity, Flood routing and Hydrographs – unit hydrographs.

Contracts, Specs & Quantities – CIVE1794

The topics of this course include General specification for buildings announcement of competition presentations documents - Competition - Application of regulations of the Kingdom tenders - Form prices - Financial guarantees - Insurance opening and evaluation of tenders - Foundation for selecting contractors - Negotiation of competitors - Definition of contracts - Conditions of validity of the contract – Parties classification of contracts - The initialization of the contract - Contract documents, rules, and regulations governing competitions - Award & contract formalities, assignment & subcontracting contract documentation - General obligations.

Construction Engineering – CIVE1795

This course includes Different types and uses of construction equipment, Equipment owning and operating costs, and Management of construction equipment. Stationery and moving scaffolds, Wooden form members, and Wooden forms design. Execution of reinforced concrete members at work sites (Foundations, Columns, Solid Slabs, Hollow block Slabs, Flat Slabs, and R.C. Stairs), The geometric design of reinforced concrete stairs, and Estimating methods of Steel Reinforcement (Foundations, Columns, Solid Slabs, Hollow block Slabs, Flat Slabs, and R.C. Stairs).

Graduation Project Part 1 – CIVE1798

This course includes: continuation of introduction to graduation project including - running and finalizing the experimental program or the mathematical / computer model - analyzing the results.

Hydraulic Structures – CIVE1796

This course includes the following: Design of stable channels - The lining of channels - Design of culvers, weirs, and regulators - Planning, design, and operation of dams - Types of dams - Seepage under hydraulic structures.

Graduation Project Part 2 – CIVE1799

Continuation of part 1 of the graduation project including - Completely finished analyzing the results - finding and drawing the conclusion - writing the complete project report - presenting and defending the project.

Elective courses descriptions are listed as follows:

Design of Reinforced Concrete Bridges – CIVE1801

This course includes Description of essential parts of bridge structure - Various types of structural forms - Materials for bridges construction. Influence lines and their application. Design of slab bridges - Design of RC T beam bridges and box Girder Bridge - Design Criteria - Code requirements - Detailing applications.

Design of Reinforced Concrete Water Tanks – CIVE1802

This course includes Introduction, Strength Design Method, Modifications according to ACI 350M-06, Requirements for the execution of water structures and tanks, Design of different types of circular concrete tanks, and Design of different types of rectangular concrete tanks.

Computer Applications in Structural engineering – CIVE1803

This course includes Introduction to finite element method - Local and global axes - Displaying some of the available software in the field of structural engineering - Using software for structural analysis of beams and frames - Load cases and combinations - Structural analysis of trusses using FE software - Moving loads on bridges - Analysis and design of reinforced concrete solid slabs, flat slabs, hollow blocks slabs, stairs, and raft foundations - Transfer drawings from AutoCAD to structural engineering software - Introduction to high rise buildings subjected lateral loads.

High Rise Buildings – CIVE1804

This course includes Structural concepts involved with tall buildings include complexity in geometry, appearance, and loading conditions. The course introduces the student to different structural forms used in the construction of tall buildings, performance indicators, and computer modeling techniques involved in the analysis and design of these structures.

Advanced Reinforced Concrete Design – CIVE1805

The course includes Arched slab - Arched girder - Truss and Vierendeel - Saw-tooth frames - Surfaces of revolution - Introduction to cylindrical shells.

Prestressed Concrete – CIVE1806

This course includes Analysis and design of prestressed concrete beams - Concept and principles of prestressing - Methods of concrete prestressing - Stress limits - Losses of prestress - Selection of section for serviceability and strength requirements - Complete analysis and design procedure of simply supported prestressed concrete beams - Relevant codes SBC304, ACI, PCI requirements.

Design of Steel Bridges – CIVE1807

This course includes Introduction to steel bridges constructions - Planning of the general layout of steel bridges - Moving loads - Shear and moment envelopes for the design truck - Secondary beams - Steel plate girders - Specifications related to the design of bridges in general with emphasis on steel bridges - Related topics required by Saudi Building Code Requirements (SBC301, SBC306) and AASHTO requirements for the bridge.

Advanced Concrete Technology – CIVE1808

The course includes the following topics: Review the basic principles of concrete materials, types, and tests - Properties of concrete ingredients- Types and main properties of additives - Quality control of concrete - Properties and applications of special types of concrete.

Rehabilitation of Concrete Structures – CIVE1809

This course includes Deterioration of concrete structures – Causes and effects of various cracks in R.C. buildings - Damage assessment & evaluation of structures - Importance of maintenance of R. C. structures - Repair materials - Methods of crack repair - Repair of various corrosion damaged structural elements (slab, beam, column, and foundation) - Column jacketing - Beam jacketing - Beam column joint jacketing - Long term health monitoring, and structural health monitoring.

Selected Topics in Structures – CIVE1810

This course includes Subjects of selected topics related to structural engineering. The subject is chosen by the instructor - The instructor declares the content and description of the course to the students at the beginning of the semester - The course content will vary each time the course is offered and will be focused on state-of-the-art concepts that are not addressed in current course selections.

Transportation Planning – CIVE1811

This course includes Data collection, transportation planning process, Forecasting travel demand, Evaluation of Transportation Alternatives, and Transportation Systems Management TSM.

Transportation and Logistics – CIVE1812

In this course, the students will take an end-to-end view of the logistics and transportation network to understand how changes in one link impact others.

Airports Design – CIVE1813

The course is designed to cover the following topics: Geometric design of "runway, taxiway, high speed exists, aprons", the structural design of airport pavement, the airports' "lightning, marking, visual aids, and land navigation".

Computer Applications in Transportation – CIVE1814

Introduction to the software and its capabilities, the software interface, and related windows importing points manipulating and editing, building the surfaces, horizontal and vertical alignment of roads, design of cross-section, production of drawings, and preparing the bill of quantities.

GPS Applications - CIVE1815

This course includes Definition and components of GPS, Signal structure and receivers, GPS errors, Procedures of field observations, Other global navigation systems in the world, and Selected applications of GPS.

Remote Sensing Application – CIVE1816

This course includes History and basic concepts of Remote Sensing, Electromagnetic energy, Remote Sensing platform and Satellites, Digital image processing, and analysis, and Remote sensing applications in Civil engineering.

GIS Applications – CIVE1817

This course includes Overview, Concepts, and fundamentals of GIS - Data, Information, Data models and Topology - Information system - Coordinate Systems and Projections - Data Analysis - Selected applications of GIS in Civil engineering fields (governmental - infrastructures and social services projects).

Selected Topics in Transportation and Surveying – CIVE1818

This course covers two main topics in the field of transportation engineering: The fundamentals of rigid pavement and the introduction to pavement management systems.

Advanced Soil Mechanics – CIVE1819

An advanced course in soil mechanics which covers slope stability analysis at the rest, active, and passive lateral earth pressure. Design different types of retaining structures that are subjected to lateral earth pressure.

Soil Improvement – CIVE1820

This course includes the principles of weak/difficult soil improvement, the different types of improvement and factors influencing them, the mechanical and hydro improvement techniques such as compaction and watering, and the physical and chemical improvements techniques such as stabilization by cement and lime.

Irrigation and Drainage Engineering – CIVE1821

This course includes the following: Types of irrigation - Design of water storage and transport systems - Planning, design, and implementation of irrigation and drainage systems - Construction requirements - Selection of equipment and materials - Operation and maintenance.

Ground Water Engineering – CIVE1822

This course includes the following: Groundwater occurrence, exploration, and characteristics - Estimation of quantities - Design of wells - Groundwater movement and flow.

Computer Applications in Water & Environmental Engineering – CIVE1823

This course includes the following: Design of water networks using EPANET - Design of water transmission lines networks using EPANET - Design of water transmission lines networks using EXCEL SHEET - Design of wastewater networks using EXCEL SHEET - Design of wastewater screens using EXCEL SHEET - Design of wastewater grit removal channels using EXCEL SHEET - Design of wastewater Imhoff Tank (Reactor) using EXCEL SHEET - Design of wastewater septic tank using EXCEL SHEET - Design of wastewater oxidation ponds using EXCEL SHEET.

Harbor Engineering – CIVE1824

This course includes the following: Planning of ports - Formation of periodic waves - Wind, Tides, and waves - Effects of waves on structures - Wave forces on structures - Design of coastal structures - Operations in the coastal areas - Sediment transport on long coast.

Water Desalination – CIVE1825

The course provides theoretical and practical aspects of seawater/brackish water desalination technologies. The main topics include basic concepts of water chemistry; detailed evaluation and technology description of thermal-based (MSF, MED, VC) and membrane-based (RO, NF, ED/EDR) desalination processes; conventional and innovative intake and pretreatment systems (including MF, UF); process design and system performance; fouling, scaling (including biofouling) and cleaning; product water quality and post-treatment. Other related topics such as innovative desalination technologies (Forward Osmosis (FO), Membrane

Distillation (MD), Adsorption Desalination (AD)); energy consumption; environmental impact; economics; hybrid systems; desalination using renewable energy; trends of the desalination market; full-scale plants and case studies, will also be covered in this course depending on time availability.

Wastewater Disposal – CIVE1826

This course includes the following: Types and composition of wastewater, methods of physical, chemical, and biological treatment, disposal methods, safety standards, treatment of sewerage and its reuse, treatment of sludge, reuse, and disposal.

Municipal Solid Waste Disposal and Treatment – CIVE1827

This course includes the following: Types and compositions of municipal solid waste - collection and storage capabilities - Disposal alternatives of solid waste and associated problems - Recycling of solid waste and reuse.

Selected Topics in Water and Environment – CIVE1828

The contents of this course are to be specified by the course instructor based on the selected subjects.

Construction Project Control – CIVE1829

The objectives of Construction Planning and Scheduling course is to provide the students with the necessary skills to adequately schedule and control building construction projects.

Construction Planning and Scheduling- CIVE1830

The objectives of Construction Project Control course are to introduce the students to the techniques used in project control systems such as the cost and work breakdown structures, cost and schedule control systems, project performance evaluation methods, and construction safety

Cooperative Training 1 – COOP1801

Describes the major student activities taking place during the cooperative training.

Cooperative Training 2 – COOP1802

Describes the major student activities taking place during the cooperative training.

9.2 Course Description For (M.Sc.)

Core Courses

Statistical Analysis of Engineers – MEM60101

Applied statistical methods for analyzing engineering and management systems including inferential statistics; nonparametric statistics; regression and correlation analysis; analysis of variance; time series analysis and forecasting models. The course is application-oriented, and examples drawn from industrial applications will be used. Students will use statistics packages such as SPSS.

Management for Engineers – MEM60102

This course is an introduction to the main principles and practices of project management. It covers projects in contemporary organizations; project initiation, organizational structures, the project manager; project planning, risk management, cost estimation, scheduling, resource allocation; monitoring and controlling projects; project contracts; ethical issues; project termination; practice using project management software packages.

Advanced Engineering Economy – MEM60103

This course covers the theory and application of advanced engineering economy principles and methods. Studies the effects of inflation, depreciation, and taxes, cost estimation, sensitivity analysis, risk and uncertainty, capital budgeting, multi-attribute decision making, advanced asset replacement analysis, and real options analysis. Includes case studies and a term project related to the topic.

Research methods and M. Sc. Seminar - MEM60104

This course introduces and discusses approaches, strategies, and data collection methods relating to research in social sciences. Postgraduates will consider how to select the appropriate methodology for use in a study to be performed. Additionally, these students will learn how to collect data based on different data collection methods and construct for academic work, considering aspects related to language, writing style, and layout. To culminate in the final stage, they will learn to write a comprehensive research proposal that may be conducted in the future. Students are required to attend seminars given by faculty members, visitors, and graduate students. Students must submit reports of the seminars they attended. Each student is also required to present one seminar on a research topic.

Applied Engineering Optimization – MEM60205

This course introduces the concepts of optimization by presenting different classes of problems. Topics include classical optimization theory and other optimization models and techniques such as linear programming, integer programming, dynamic programming, nonlinear programming, modern heuristics, and metaheuristics. Applications of these techniques in different engineering disciplines are also presented.

Engineering Project Management – MEM60306

This course aims to introduce students to the theory and practice of project management. The course covers topics of project management framework, project organization, conflicts and negotiations, scope management, time management, cost management, risk management, contracts and procurement, and modern developments in project management.

Project Cost Estimation – MEM60307

This course covers topics on the procedures and techniques used for estimating the cost of construction projects. This may include: the cost estimation process; elements of project cost; conceptual and cost estimation techniques; types of construction cost estimates, construction pricing, and contracting; controlling and monitoring of project costs; computer-aided estimating; and Case studies.

Project Planning and Control – MEM60408

This course covers the theory and practice of decision analysis and risk assessment. The course covers decision theory, game theory, utility and risk attitude, probability assessment, and multi-criterion decision-making models. Describes practical applications through real-world engineering/project management decision analysis applications. Computer applications.

Risk Management and Innovation – MEM60409

Risk and innovation increasingly go hand in hand in modern management. This course will be equipped with a grounding in risk management and innovation theory and how it is applied in practice within the engineering environment. Students will evaluate the relationship between risk and the way he can leverage it to facilitate innovation and the implications that this has on organizational culture and human resources. The course will use practical scenarios and a range of case studies to investigate the impact of risk and innovation on Engineering practice.

Research project – PROJ60001

Students have to carry out independent project work that involves formulating and solving an engineering problem under the direct supervision of a faculty member. The project has to be carried out over two semesters, typically during the final two semesters. They are

required to submit a written report and make an oral presentation of the project. Prerequisite: Completion of at least 18 credits including M. Sc. Seminar.

Thesis – THES60001

Students have to conduct research, prepare a written thesis, and defend it at a final oral examination before a committee. The thesis should exhibit competence in the research process by applying an existing body of knowledge in the critical analysis of a new question or of a specific problem or issue in a new setting. Students are expected to submit for publication at least one refereed article before passing the defense. Prerequisite: Completion of at least 6 credits including M. Sc. seminar.

Elective courses descriptions are listed as follows:

Safety Engineering Management – MEM60212

This course includes Introduction to safety management systems and regulations; types of occupational hazards; risk management strategies; workplace and process safety assessment tools; heat stress; management of hazardous substances, industrial pollutants, and hazardous waste; emergency and evacuation plans; occupational diseases; fire safety; environmental safety; safety culture.

Engineering Design, Methodology & Applications – MEM60213

This course covers topics on design creativity & problem-solving, engineering conceptual design & embodiment design, practices for product realization design theories and methodologies, parametric design, probabilistic design, industrial design, design and manufacturing integration, concurrent engineering, materials selection in design, engineering design communication, Applications of design theories and methodologies.

Product Innovation and Design Management – MEM60214

This course covers the critical factors affecting product development and innovation and identifies the common characteristics of successful new products drawing upon best industrial practices. The aim is to provide students with an understanding of the managerial and technical processes commonly involved in product development and innovation. Three main subjects will be covered throughout this course: Product Design and Innovation; Idea Generation Techniques; Design and Innovation Project Management.

Artificial intelligence: Reasoning and decision-making – MEM60215

The course presents artificial intelligence history and applications, Intelligent Agents, Basic Search Strategies, Constraint Satisfaction, Advanced Search Strategies, Knowledge Representation, Logical Agents, Knowledge base reasoning, Reasoning in Uncertain Situations, Review, and Project presentation.

Decision Support System – MEM60316

This course aims to introduce students to the concept of DSS. The course presents basic principles and concepts of DSS in organizations, including its role in organizations and strategic planning and data mining function, and the importance of decision-making in achieving organizations' targets. The course allows students to discover theoretical and technical tools related to DSS applications. Finally, the course includes academic situations and uses case studies allowing students to test their knowledge and learn more about practicing data mining systems, and artificial intelligence applications and tools within private and public organizations.

Principal of Supply Chain Management – MEM60317

This course presents an introduction to operations and supply chain management. The design of the chain supply network. Creating value through operations and supply chains. Operations and supply chain strategies, establishing the operations environment, process choice and layout decisions in manufacturing and services, business processes, managing quality and capacity, establishing supply chain linkages, supply management, logistics, planning and controlling operations, supply chains forecasting, sales, and operations planning, managing inventory throughout the Supply Chain, Managing Production across the Supply Chain and JIT/Lean Production

Infrastructure Project Finance and Management – MEM60318

This course presents an introduction to project finance and management, transaction management, financial structuring, financial modeling, case study- resource financing, and infrastructure financing.

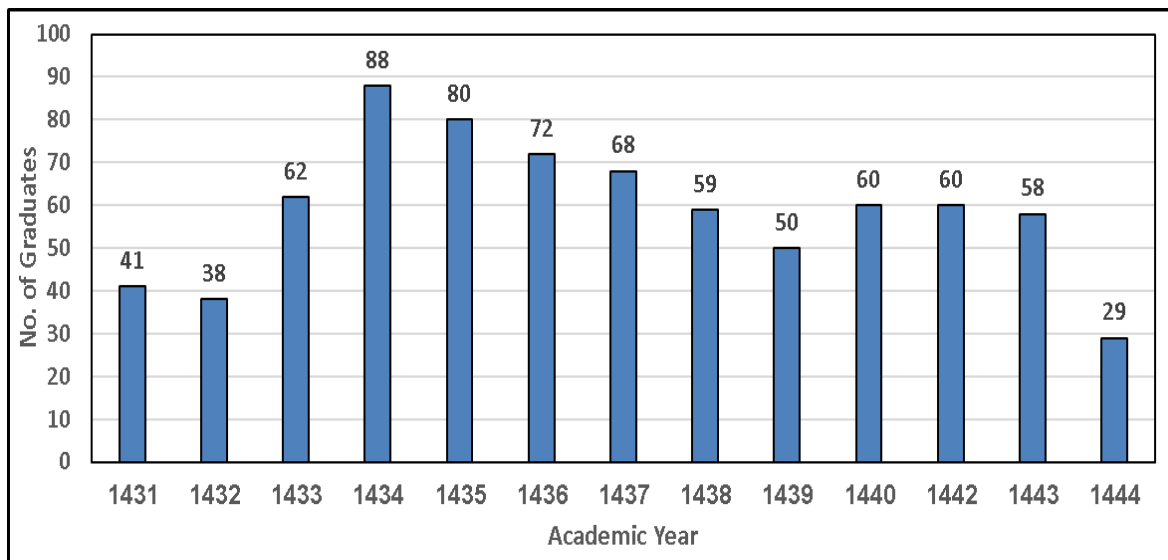
Strategic Management – MEM60319

This course introduces the key concepts, tools, and principles of strategy formulation and competitive analysis. It is concerned with managerial decisions and actions that affect the performance of business enterprises. The course is focused on the information, organizational processes, and skills that business judgment managers must use to devise strategies, position for their businesses, define firm boundaries, and maximize long-term profits in the face of uncertainty and competition.

10. Alumni

10.1 Alumni Record

The study in the civil engineering department was started with the start of Al-Baha University in the academic year 1426/1427 H and the first graduate of the department was in the 2nd semester of the academic year 1430/1431 H. The following figure shows the number of the graduates of civil engineering department from its foundation date until the academic year 1443/1444 H. The number of graduates ranged from 29 in 1444 (with the end of the 2nd semester) to 88 in 1434 with an average value of 60 graduates annually. The system of study in the department was two semesters annually in addition to the summer semester until the academic year 1443. In the academic year 1444, the system of study in the department was transformed to three semesters annually. In addition to the bachelor program, the civil engineering department started the study in the master program (M. Sc.) and the first graduates of the program were 20 in the academic year 1443.



10.2 Jobs and graduate attributes

Graduates from the civil engineering department are equipped with all the tools and skills necessary to flourish and thrive in the engineering sector. The graduates are technically knowledgeable, well-founded, and fully aware of the fundamentals of basic science, engineering science, and ethical and societal responsibilities. We strive to enhance graduates' skills through enrolling in graduate studies, life-long training, and interacting with professional societies. The department alumni have the following attributes:

- **Critical Thinking:** Ability to think critically and creatively.
- **Continuous Self-education:** Ability to acquire new knowledge on an ongoing basis.
- **Communication, Professional Behaviors, and Teamwork Skills:** Ability to interact effectively with others and implement professional behaviors in a team environment.
- **Planning and Organizational Skills:** Ability to plan and organize to reach objectives in each environment.
- **Competency to Solve Engineering Problems:** Ability to solve engineering problems using principles, tools, and practices.
- **Analysis and Interpretation:** Ability to analyze and interpret data and information.

The department alumni with these attributes are qualified for the following jobs:

1. Surveyor
2. CAD technician
3. Building engineer
4. Transport engineer
5. Construction engineer
6. Environmental engineer
7. Structures design engineer
8. Geotechnical engineer
9. Water resources engineer
10. Project manager

11. Al-Baha University Support Services

Al-Baha University has many services, such as Student Support Services, Counseling Services, etc., to help you whether your needs are related to academic or personal issues.

11.1 Deanship of Students Affairs

Deanship of Students Affairs is located in the Administration Building and Assistant Deanships and offers services related to rehabilitating students psychologically, socially, culturally, and athletically. In addition, the Deanship of Student Affairs seeks also to develop programs and services for students, establish partnerships with community institutions to exchange experiences and improve the quality of services provided to students. The Deanship is committed to keeping national and Islamic culture in achieving its vision. Seminars are offered on topics. For appointments or further information on this service, call 966-17-7257700 Ext 15813. The web address for the Deanship of Students Affairs found at <https://bu.edu.sa/en/web/deanship-of-students-affairs/home>

11.2 University Medical Center

Al-Baha University provides medical care services to serve students and help them achieve the healthiest form of themselves. For appointments or further information on this service use the web address for University Medical Center found at

<https://bu.edu.sa/en/web/university-medical-center/home>

11.3 Unit of National and International Scholarships

International student advising is available at the Unit of National and International Scholarships. The Scholarships Unit organizes the application and admission process for scholarship applicants for postgraduate programs at Al-Baha University. The unit receives the submitted applications and follows the admission procedures according to the regulations and instructions issued by the Ministry of Education. For further information on this service or appointments, call 966-17-7257700 Ext 15333 and 15334 or visit

<https://bu.edu.sa/ar/web/deanship-of-graduate-education/unit-of-national-and-international-scholarships>

11.4 Accessibility Services

Al-Baha University provides all services and assistance to students with special needs, which include detection and identification of the problems they face, to provide services and devices that ensure a suitable educational environment for them to complete the academic stage in the department. In addition to providing preparation programs for them once they are accepted, which include psychological and social preparation and work to integrate them into the university environment and participate in student activities. For appointments or further information on this service, call 966-17-7257700 Ext 15813. The web address for the Deanship of Students Affairs found at <https://bu.edu.sa/en/web/deanship-of-students-affairs/home>