



Program Guide

2019-2020

**Department of Civil Engineering
College of Engineering
Najran University**

THE DEAN'S WORD

The Government of the Custodian of the Two Holy Mosques has done all efforts to ensure the welfare of its citizens and placed them in a position among highly civilized and cultural nations.

As a first priority, great efforts have been exerted to propose development plans for the improvement of our beloved kingdom to meet the needs of the citizens. According to the governmental policies, the demands of the developmental plans and the Saudi nationwide renaissance, educational institutions have carried the responsibilities to build, educate and develop the generations who are the bases of development in all fields. As part of them, Najran University has set its plans to graduate qualified students in various fields of knowledge.



College of Engineering, as one of the other fourteen colleges of the University, was established in 1431 AH according to the recommendation of the University Council to meet the needs of Najran Region. In its strategic plan, the college has established six scientific departments. They are: Electrical Engineering, Civil Engineering, Architectural Engineering, Mechanical Engineering, Chemical Engineering, and Industrial Engineering. We are grateful to Allah, that some batches have been graduated from three departments (Electrical Engineering, Civil Engineering and Architectural Engineering).

The College endeavors to provide an integrated learning environment to achieve the plans of its programs which have been built according to the latest international standards and to keep up with the standards of the Saudi National Center for Academic Accreditation and Evaluation (NCAAE) and the American Accreditation Board for Engineering and Technology (ABET). These have been done through the following:

1- Providing classrooms with the best modern technologies in education to give the student the opportunity of receiving information in more than one way of learning in the classroom. Therefore, students can use the programs of laptops /computers, the applications of tablets and cell devices to synchronize them with the smart projector in the classroom. In addition, they can use other social media applications and E-learning provided by the university.

2 - Preparing laboratories for all departments of the faculty and providing them with the latest international modern equipment that are compatible with advanced engineering technologies.

3 – Recruiting highly qualified academic members.

4 - Establishing research units in engineering sciences and sustainability so that students can enrich their knowledge by receiving additional courses, implementing their graduation projects and keeping up with the new researches in various fields of engineering such as the use of IOT, Energy Efficiency, and Green Buildings.

The College of Engineering at Najran University is aware of the goals of the kingdom 2030 vision, so the faculty has adopted two initiatives that have been accredited by the office of Vision Achievement in the Ministry of Education. They are:

1. Automating the measurement of learning outcomes in university education;
2. Providing dual degree programs in engineering in collaboration with international engineering colleges.

Dean

College of Engineering, Najran University

Abdullah Alwadie, PhD

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INTRODUCTION

NAJRAN UNIVERSITY

The custodian of the Two Holy Mosques King Abdullah Bin Abdulaziz, may Allah bless him, issued a royal decree of establishing Najran University on Shawaal 10th, 1427A.H. during the inauguration ceremony of the University campus.

Najran University is located on the Eastern outskirts of the city of Najran, with an area of 18 million square meters, thus becoming the largest University campus all over the Kingdom. It consists of 14 and 10 colleges for males and females respectively, with an overall capacity of 45 thousand students. The university will also have a medical city, a research center, a sport and entertainment arenas and accommodation for the faculty and staff members as well as students. There will also be a future investment city to serve as a trust foundation for the university. The investment will include, not exclusively, hotels, commercial centers and private schools.

UNIVERSITY VISION AND MISSION

Vision

The vision of Najran University is for "Leadership in teaching, learning, and community service and active contribution to building a society of science and knowledge".

Mission

Najran University is committed in "Offering teaching and learning that address the needs of society and the labor market; effective contribution to sustainable development through conducting applied research and optimal use of modern technologies; and establishing partnerships at the local, regional and global levels".

Strategic objectives

Najran University has number of strategic objectives to achieve its goal in the field of higher education, listed as follows:

- (1) Achieving academic programs that can compete internationally within the framework of Islamic values.
- (2) Graduating distinguished students with great efficiency for the future.

- (3) Promoting the competencies and efficiency of the teaching staff.
- (4) Enhancing and investing in university facilities as well as utilizing new technologies.
- (5) Improving learning resources in line with the universal standards.
- (6) Providing excellent services and support for students.
- (7) Developing the financial and administrative systems according to the total quality standards.
- (8) Securing a prosperous professional future for the alumni.
- (9) Developing academic research policy to support sustainable development.
- (10) Improving Post-graduate programs.
- (11) Continuous and effective commitment to community service.
- (12) Establishing a framework for national, regional and global cooperation and partnership.

Rules and Regulations

Najran University's regulations are based on the statute and regulations of the Board of Higher Education and Universities, which was approved by the Council of Ministers on 4. 4. 1414 A.H. The statute consists of the following:

- Board of Higher Education Statute.
- Regulations of College Education and Examination.
- Regulations of University Financial Affairs.
- Regulations of Hiring Non-Saudis at Saudi Universities.
- Regulations of Scholarships & Training of University Personnel.
- Unified Regulations of Higher Studies at Saudi Universities.
- Regulations of Saudi Personnel Affairs- Faculties and the Like.
- Regulations of Scientific Research.
- Regulations of Scientific Societies at Saudi Universities.

Process for Students Evaluation

The process of evaluating students' performance in the courses registered by the student in each semester will be conducted by the instructors who are teaching the courses. The instructor evaluates students' performance in each course. The instructor designs the assessments for finding out the attainment of the course learning outcomes specified by the curriculum committee. The instructor may distribute marks on home assignments, quizzes, mid-semester examinations, term project and a final examination to objectively evaluate students' performance, which later will be accumulated over percentage and finally converted into the attainment of the course learning outcomes (CLOs) and student outcomes (SOs) using CLOSO software. In the courses that involve laboratory classes, laboratory performance, written reports (for each experimental work throughout the semester) and the final laboratory examination are used to assess the attainment of the CLOs and SOs. Based on the policy and implementation rules of examinations and grades, CE program has formulated a grading policy that was approved by the departmental council.

Assessment of a course is usually based on the combination of grades awarded to course work (performance throughout the semester) and the final examination. Each course has a total of 100 points. Out of this, the instructor evaluates 50% marks to the course work consisting of quizzes, homework, term projects and mid-term or other periodic assessments while the remaining 50% is evaluated in the final examination. A grade of “Incomplete” (IC) is given to the student if the course requirements are not fulfilled by the student. This is usually endorsed in courses that require a project to be completed by the student. It is awarded only on the recommendation of the instructor and approval of the Department Council. The student getting IC must fulfill the requirements during the following semester; otherwise the IC is automatically changed to “F”.

Najran University requires that students do not miss more than 25% of the total number of lectures, labs, and tutorials. Students failing to meet this requirement in any of the courses are prohibited from appearing in the final examination of that course and earn a DN (Denied) grade in that course. A student who is absent in the final examination of a course(s) for an acceptable reason approved by the department council and the dean of the college, is allowed to take the examination at a later date.

Table 1 shows the grading system of Najran University. The instructor awards the marks out of 100. The marks are converted to a letter grade and grade points according to the following Table 1.

Table 1 Grading System at Bachelor of Civil Engineering Program in Najran University.

Percentage	Evaluation	Letter Grade	Grade Point Average out of 5
95 – 100	Excellent Plus	A +	5.00
90 to less than 95	Excellent	A	4.75
85 to less than 90	Very Good Plus	B +	4.50
80 to less than 85	Very Good	B	4.00
75 to less than 80	Good Plus	C +	3.50
70 to less than 75	Good	C	3.00
65 to less than 70	Pass plus	D +	2.50

60 to less than 65	Pass	D	2.00
Less than 60	Fail	F	1.00
	Incomplete	IC	-
	Denied	DN	-

At the end of each semester, the instructors submit the grades of all courses through the online grading system (Edugate) that is approved by the department head and dean of college of Engineering. The student's performance and progress are determined by the grade point average (GPA). A sample of student's grade report and the calculated GPA for six (6) subjects in a typical semester is shown in Table 2.

Table 2 Calculated Grade Point Average (GPA).

Course	Credit Hours (CH)	Point Marks out of 100	Letter Grade	Grade points per Credit Hours (GP)	Total Grade Points CH×GP
Course 1	2	90	A	4.75	9.50
Course 2	3	85	B+	4.5	13.5
Course 3	3	78	C+	3.5	10.5
Course 4	3	82	B	4.0	12.0
Course 5	4	77	C+	3.5	14.0
Course 6	2	71	C	3.0	6.0
Total	17				65.5
Computed GPA = Total Grade Points / Total Credit Hours = 65.5/17=3.85					

ABOUT THE CIVIL ENGINEERING DEPARTMENT

The Civil Engineering Department was established in 2007 as one of the major departments of Najran University and has been actively engaged in teaching in different specializations of Civil Engineering, such as; in addition of basic project management techniques ; Geotechnical Engineering, Water Resources and Environmental Engineering, Transportation Engineering and Highway Engineering, Construction Engineering, and Structural Engineering.

Civil Engineering Department is programmed to award Bachelor in Civil Engineering. Until now, the program is offered for males only. Courses in Civil Engineering are offered through the College of Engineering and have produced its first graduates in 2012/2013. The language of instruction of the program is English.

The program is mainly a teaching program giving emphasis on teaching basic skills, theoretical knowledge and practical experiences necessary for practicing the occupation of Civil Engineering. The department assists the students to be familiar with local and global Civil Engineering application trend, graduating qualified engineers with great knowledge in the specializations of Civil Engineering mentioned above.

The department is fully equipped with laboratories that cover all needs and aspects of Civil Engineering. These laboratories are subjected to a continuous updating to keep pace with the latest technology requirements.

DEPARTMENT VISION AND MISSION

Vision

To lead the department in civil engineering education and to apply research, professional practice, and community services.

Mission

Civil Engineering program is committed to:

- Provide students with an accredited civil engineering education of high quality standards
- Generate graduate possessing excellent knowledge and strong competent skills and uphold professional attitudes necessary in fulfilling his responsibilities towards Almighty and society and meet the industry's expectations.
- Conduct high quality applied civil engineering research using the best modern technology.
- Provide innovative solution for Civil Engineering problems that contribute to the sustainable development.
- Build knowledge society nationally and internationally.

The figure 1 below shows the organizational chart for College of Engineering.

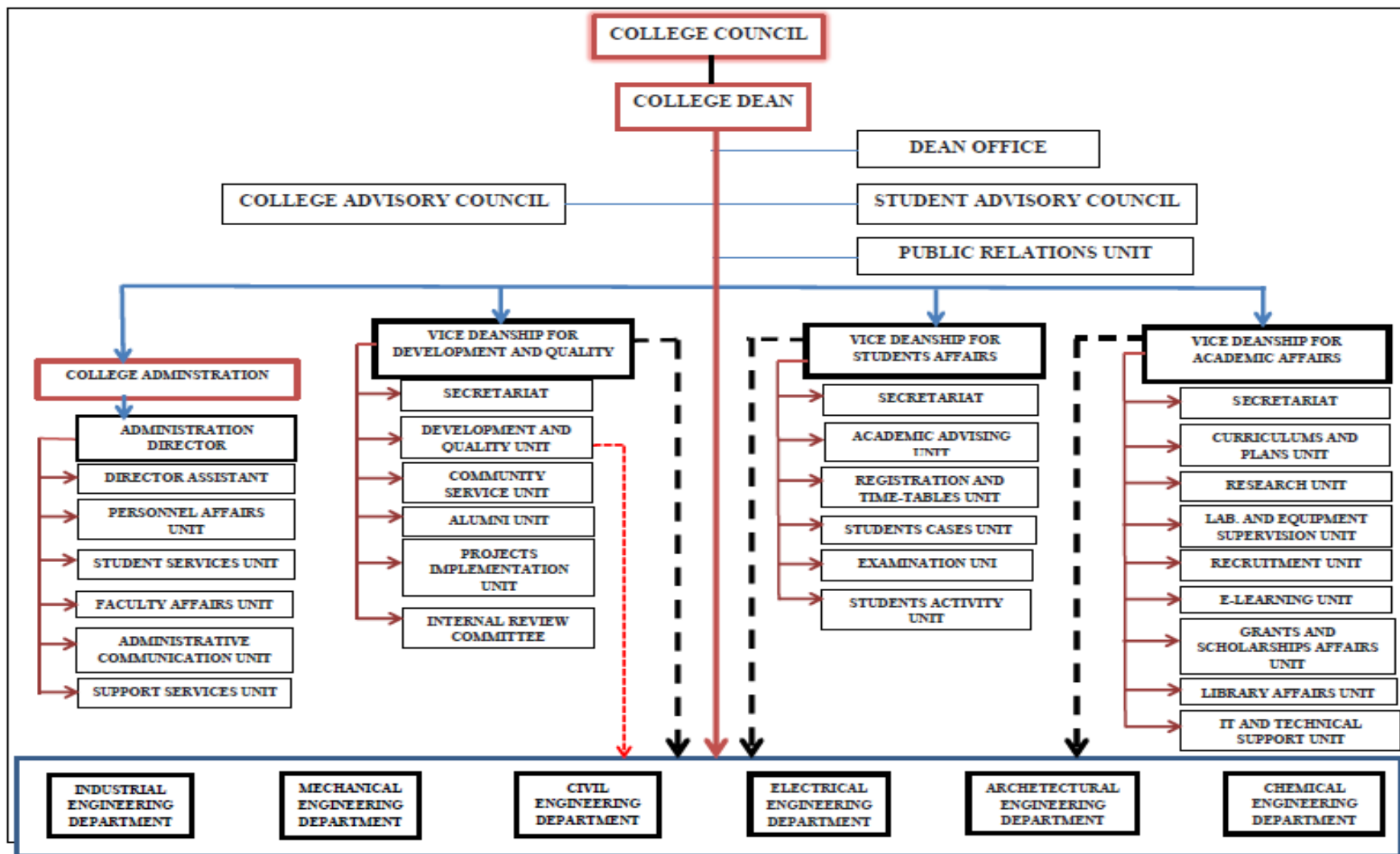


Figure 1: Flow chart for College of Engineering

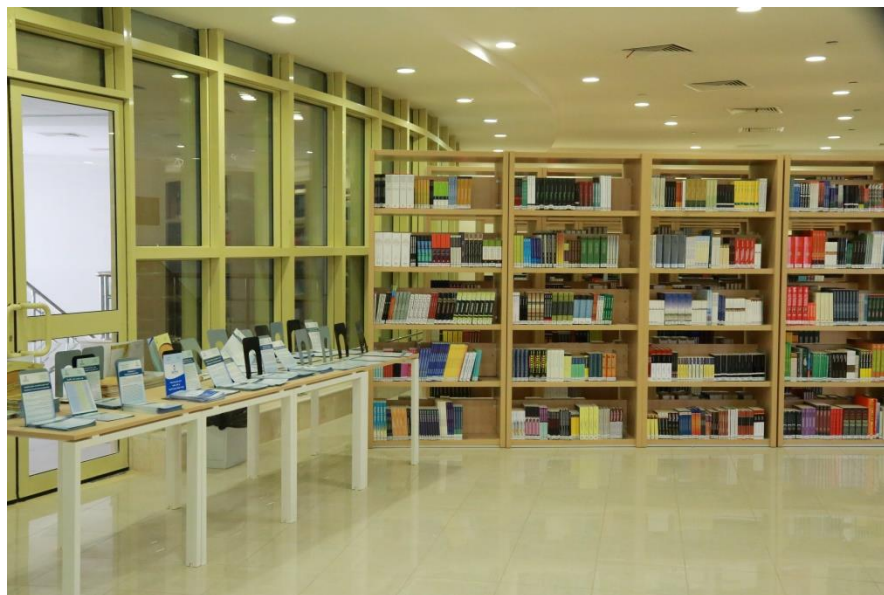
Library Services

The University library (Prince Mesha'al Library) is centrally located within the University campus. Its current collections of monographs and bound periodicals exceed 310,000 volumes from more than 300 publishers. The collection is comprised of 80% in Science and Engineering and 20% in Humanities and Social Sciences. The library subscribes to 1,264 periodical titles and 1,249 electronic journals too. It also maintains 37,522 reels of journal earlier issues on microfilm. The library contains a large range of information resources such as books, periodicals, digital libraries, documents, manuscripts, audio-visual material, maps and atlases, and other electronically accessible material. It contains more than one hundred thousand books. The website can be found at: <http://www.nu.edu.sa/web/guest/979>

The services offered by the library are summarized below:

- *Online Searching:*

The NU Library has online access through the internet to more than 600 international databases covering humanities, social sciences, sciences and engineering.



- *Book Loans and Reading in the Library:*

In addition to the online searching and use of international databases, instructors and students can go directly to the central library and order their books. Besides the central library, we have another departmental library for the Department of Civil Engineering from which the instructors can easily make their loans of specialized content.



PROGRAM OFFERED

The Department of Civil Engineering offers Bachelor of Civil Engineering, after completion of 132 credit hours along with non-credit summer training.

Program Objectives

The graduates of CE program are prepared to achieve the following program objectives:

- Technically competent in their respective Civil Engineering field and conceiving, designing and executing broad range of Civil Engineering tasks locally and globally
- Meet industry expectations in Civil Engineering with excellent communication and leadership skills.
- Contribute to the society through providing innovative solution for Civil Engineering problems and function on multi-disciplinary team.
- Pursue their Civil Engineering professional development through self-learning and advanced graduate studies if qualified and interested.
- Uphold professional and social ethics necessary in fulfilling his responsibilities towards the Almighty, clients and the society contribute to the sustainable development of the Kingdom.

Program Outcomes

1. Identify and apply knowledge of mathematics and sciences and engineering in civil engineering problems.
2. Design and conduct experiments, as well as to analyze and interpret data required for solving civil engineering projects.
3. Design optimum system/component of civil engineering facilities/infrastructures to

- meet desired needs using realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. Function effectively in multi-disciplinary construction project/civil engineering teams.
 5. Identify, formulate, and solve civil engineering problems and to evaluate and synthesize information in order to provide best alternative solutions.
 6. Act professionally and ethically and recognize the impact of liability issues in civil engineering projects and constructions.
 7. Communicate effectively prepare professional written materials, graphical communications and deliver professional oral and written presentations.
 8. Recognize the broad education necessary to understand the impact of engineering solutions to economic, environmental and society and to improving quality of life.
 9. Recognize the need in life-long learning and to engage in continuing education of professional/engineering skills.
 10. Recognize the knowledge of contemporary issues in planning, designing, constructing, and rehabilitating civil engineering infrastructures.
 11. Develop and use techniques and skills using modern engineering methods and tools needed in civil engineering practices.

Students Attributes

At the end of the program, the student will attain the following attributes:

1. Ability to undertake civil engineering problems identification, formulation and solution.
2. Ability to utilize a systems approach to complex problems and to design and operational performance in the field of civil engineering.
3. Proficiency in civil engineering design systems to meet desired needs with realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.
4. Ability to conduct an engineering project.
5. Ability to communicate effectively, with the engineering team and the community at large.
6. Capacity for creativity and innovation.
7. Ability to understand professional and ethical responsibilities and committed to them.
8. Ability to function effectively as an individual and in multidisciplinary and multicultural teams, as a team leader or manager as well as an effective team

member.

9. Capacity for life-long learning and professional development.
10. Ability to recognize the contemporary issues in civil engineering disciplines.

The Academic Plan

The plan of study for Civil Engineering Program is shown in Table 1. Student will be admitted to Civil Engineering Program after completing the two semesters (level 1 and level 2) in the Preparatory year Program that consists of 27 credit hours including 6 credit hours Math courses, in addition to other educational courses. The courses of curriculum of Civil Engineering Program are shown in Figure 1. The curriculum consists of 132 credit hours. The curriculum includes seven courses of general education of 18 credits. Six courses of Arabic language and Islamic studies of 12 credits are required by the university. Two courses of 5 credit hours of communication skills (English courses). The study plan includes nine courses of 29 credit hours of mathematics and basic sciences. These courses cover four basic sciences such as math, math based physics, chemistry and computer programming. This is completely fit the requirement of civil engineering program by ABET. The curriculum also includes 24 courses of 68 credit hours of core civil engineering courses. In addition one course of co-operative field training of zero credit hour.

A flowchart that illustrates the prerequisite structure of the civil engineering program's required courses is shown in Figure 5-2.



Figure 5-2: Prerequisites Flowchart for Civil Engineering Program

Table 1 Curriculum of Civil Engineering Program

No.	Curriculum Component	No. of Courses	No. of Credit Hours
1.	University Requirement Courses	6	12
2.	Faculty Requirements	Communication Skills	5
		Math and Science	29
		General Engineering	18
3.	Department Requirements	24	68
4.	Cooperative Field Training	1	0
Total		49	132

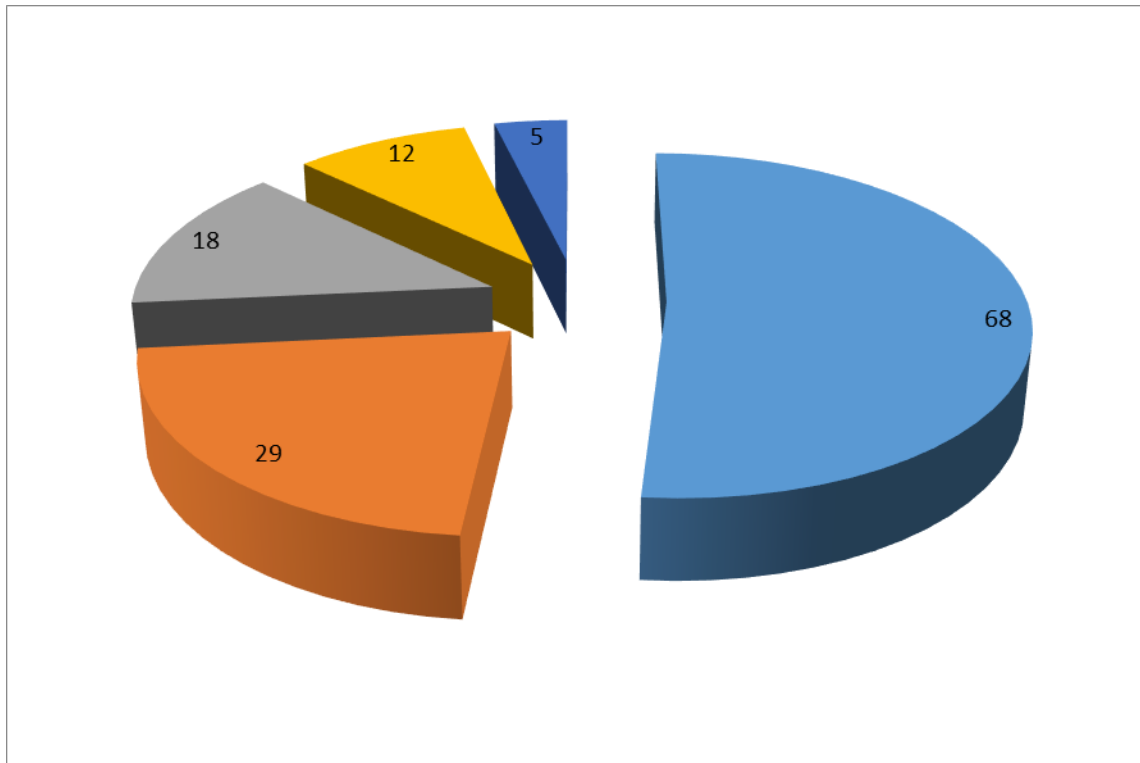


Figure 1: Credit Hours Distribution of Civil Curriculum Component

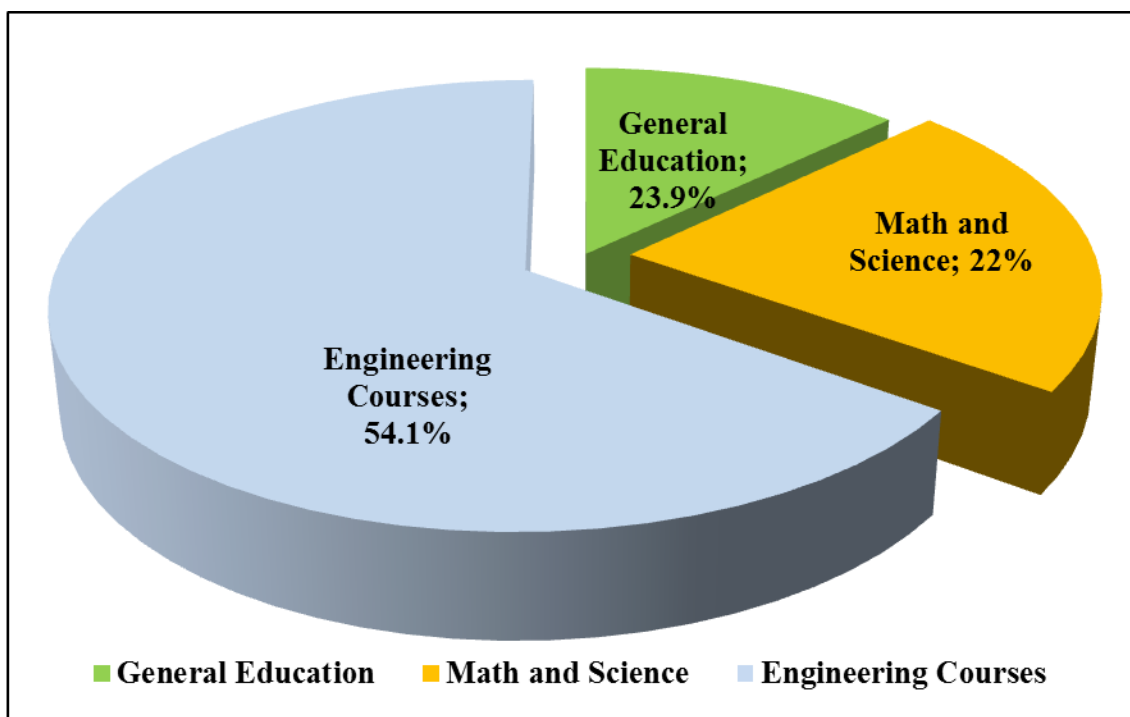


Figure 2: Curriculum Distribution according to ABET general criteria by percent

Table 2: Civil Engineering Curriculum Components

Prep. Year			
No.	Course Code	Course Title	Credit Hours CR (Theory, Lab, Tut.)
1.	140TEC-3	Computer Skills	3 (3 , 0 , 0)
2.	140MATH-2	Introduction of Mathematics	2 (2 , 0 , 0)
3.	140SKL-2	Learning, Thinking and Research Skills	2 (2 , 0 , 0)
4.	140ENGG-2	English Language :Reading Skills	2 (2 , 0 , 0)
5.	141ENGG-2	English Language :Writing Skills	2 (2 , 0 , 0)
6.	142ENGG-2	English Language :Listening and Speaking Skills	2 (2 , 0 , 0)
7.	143ENGG-2	English Language :Grammars	2 (2 , 0 , 0)
8.	150MAN-1	Occupational Ethics	1 (1 , 0 , 0)
9.	150MATH-4	Algebraic Sciences	4 (4 , 0 , 0)
10.	150SKL-2	Communication Skills	2 (2 , 0 , 0)
11.	150ENGG-3	English Language: Speaking	3 (3 , 0 , 0)
12.	151ENGG-2	Report Writing	2 (2 , 0 , 0)
	Total		27(27 , 0 , 0)
University Requirements			
No.	Course Code	Course Title	Credit Hours CR(Theory,Lab,Tut.)

1.	111ISL-2	Introduction to Islamic Culture 1	2 (2 , 0 , 0)
2.	112ISL-2	Introduction to Islamic Culture 2	2 (2 , 0 , 0)
3.	201ARAB-2	Arabic Language Skills	2 (2 , 0 , 0)
4.	113ISL-2	Islamic Culture (3)	2 (2 , 0 , 0)
5.	202ARAB-2	Arabic Writing	2 (2 , 0 , 0)
6.	114ISL-2	Islamic Culture (4)	2 (2 , 0 , 0)
	Total		12(12 , 0 , 0)
Faculty Requirements			
Faculty Requirements			
No.	Course Code	Course Title	Credit Hours CR(Theory,Lab,Tut.)
1.	107ENG-3	Technical Writing	3 (3 , 0 , 1)
2.	108ENG-2	Communication Skills for Engineers	2 (2 , 0 , 1)
	Sub Total		5 (5 , 0 , 2)
Math and Science			
No.	Course Code	Course Title	Credit Hours CR(Theory,Lab,Tut.)
1.	101CHM-3	General Chemistry	3 (3 , 0 , 1)
2.	104PHIS-4	Principles of Physics	4 (3 , 2 , 1)
3.	106MATH-3	Introduction to Integration	3 (3 , 0 , 1)
4.	107MATH-3	Algebra & Analytical Geometry	3 (3 , 0 , 1)
5.	203MATH-3	Advanced Calculus	3 (3 , 0 , 1)
6.	105PHIS-4	Advanced Physics	4 (3 , 2 , 1)
7.	204MATH-3	Differential Equations	3 (3 , 0 , 1)
8.	324STAT-3	Probabilities and Engineering Statistics	3 (3 , 0 , 1)
9.	254MATH-3	Numerical Methods	3 (3 , 0 , 1)
	Sub Total		29 (27 , 4 , 9)
General Engineering			
No.	Course Code	Course Title	Credit Hours CR(Theory,Lab,Tut.)
1.	101GE-3	Statics	3 (3 , 0 , 1)
2.	102GE-2	Introduction to Engineering Design	2 (2 , 0 , 1)
3.	203GE-3	Engineering Drawing	3 (1 , 4 , 1)
4.	205GE-3	Dynamics	3 (3 , 0 , 1)
5.	306GE-2	Engineering Economy	2 (2 , 0 , 1)
6.	407GE-2	Management of Engineering Projects	2 (2 , 0 , 1)
7.	204GE-3	Computer Programming for Engineers	3 (2 , 2 , 1)
	Sub Total		18 (15 , 6 , 7)
	Grand Total		52 (47 , 10 , 18)
Department Requirements (Core Course)			
No.	Course Code	Course Title	Credit Hours CR(Theory,Lab,Tut.)
1.	241CE-3	Strength of Materials	3 (3 , 0 , 1)
2.	261CE-3	Surveying (1)	3 (2 , 2 , 1)
3.	221CE-3	Soil Mechanics (1)	3 (2 , 2 , 1)

4.	211CE-3	Fluid Mechanics	3 (2 , 2 , 1)
5.	251CE-3	Structural Analysis (1)	3 (3 , 0 , 1)
6.	312CE-3	Hydraulics	3 (2 , 2 , 1)
7.	352CE-3	Reinforced Concrete (1)	3 (3 , 0 , 1)
8.	342CE-3	Properties and Testing of Materials	3 (2 , 2 , 1)
9.	353CE-3	Structural Analysis (2)	3 (3 , 0 , 1)
10.	313CE-3	Hydrology	3 (2 , 2 , 1)
11.	371CE-3	Sanitary Engineering	3 (2 , 2 , 1)
12.	354CE-3	Reinforced Concrete (2)	3 (3 , 0 , 1)
13.	381CE-2	Computer Applications in Civil Engineering	2 (1 , 2 , 1)
14.	355CE-3	Steel Structures	3 (3 , 0 , 1)
15.	322CE-3	Soil Mechanics (2)	3 (2 , 2 , 1)
16.	462CE-3	Surveying (2)	3 (2 , 2 , 1)
17.	431CE-3	Highway Engineering	3 (2 , 2 , 1)
18.	423CE-3	Foundation Engineering	3 (3 , 0 , 1)
19.	491CE-2	Graduation Project (1)	2 (2 , 0 , 0)
20.	414CE-3	Water Resources Planning and Management	3 (3 , 0 , 1)
21.	432CE-3	Transportation and Traffic Engineering	3 (3 , 0 , 1)
22.	472CE-3	Environmental Engineering	3 (3 , 0 , 1)
23.	433CE-2	Construction Equipment and Methods	2 (2 , 0 , 1)
24.	492CE-2	Graduation Project (2)	2 (2 , 0 , 0)
24	Sub Total		68 (57 , 24 , 22)
25	391CE-0	Cooperation Field Training	0 (0 , 0 , 0)

Table 3. Study Plan for Civil Engineering Program per Semester

1st Year: Preparatory			
1 st Semester			
Course #	Course Title	Credits	Pre- Requisite
140 TECH-3	Computer Skills	3	....
140 MATH-2	Introduction of Mathematics	2	....
140 SKL-2	Learning, Thinking and Research Skills	2	....
140 ENGL-2	English Language: Reading Skills	2	....
141 ENGL-2	English Language: Writing Skills	2	....
142 ENGL-2	English Language: Listening and Speaking Skills	2	....
143 ENGL-2	English Language: Grammars	2	....
Total Credits		15	
2 nd Semester			
Course #	Course Title	Credits	Pre- Requisite
150 MAN-1	Occupational Ethics	1	....
150 MATH-4	Algebraic Sciences	4	....

150 SKL-2	Communication Skills	2	....
150 ENGL-3	English Language: Speaking	3	....
151 ENGL-2	Report Writing	2	....
Total Credits		12	

2nd Year			
1 st Semester			
Course #	Course Title	Credits	Pre- Requisite
101 CHEM-3	General Chemistry	3	....
104 PHYS-4	Principles of General Physics	4	....
106 MATH-3	Integral Calculus	3	....
107 MATH-3	Algebra & Analytical Geometry	3	....
107 ENGL-3	Technical Writing for Engineers	3	....
Total Credits		16	
2 nd Semester			
Course #	Course Title	Credits	Pre- Requisite
111 IC-2	Introduction to Islamic Culture	2	....
101 GE-3	Statics	3	107 MATH
203 MATH-3	Advance Calculus	3	106 MATH
102 GE-2	Introduction of Engineering Design	2	....
108 ENGL-2	Communication Skills for Engineers	2	107 ENGL
105 PHYS-4	Advanced Physics	4	104 PHYS
Total Credits		16	

3rd Year			
1 st Semester			
Course #	Course Title	Credits	Pre- Requisite
112 IC-2	Islamic Culture (2)	2	....
204 MATH-3	Differential Equations	3	106 MATH
204 GE-3	Computer Programming for Engineers	3	....
241 CE-3	Strength of Materials	3	101 GE
261 CE-3	Surveying (1)	3	....
203 GE-3	Engineering Drawing	3	....
Total Credits		17	
2 nd Semester			
Course #	Course Title	Credits	Pre- Requisite
221 CE-3	Soil Mechanics (1)	3	....
211 CE-3	Fluid Mechanics	3	....
324 STAT-3	Engineering Probability and Statics	3	....
201 ARAB-2	Language Skills	2	....

205 GE-3	Dynamics	3	101 GE
251 CE-3	Structural Analysis (1)	3	241 CE
Total Credits		17	

4thYear			
1st Semester			
Course #	Course Title	Credits	Pre- Requisite
312 CE-3	Hydraulics	3	211 CE
352 CE-3	Reinforced Concrete (1)	3	241 CE
254 MATH-3	Numerical Methods	3	204 MATH
342 CE-3	Properties and Testing of Materials	3	241 CE
353 CE-3	Structural Analysis (2)	3	251 CE
306 GE-2	Engineering Economy	2	....
Total Credits		17	
2nd Semester			
Course #	Course Title	Credits	Pre- Requisite
313 CE-3	Hydrology	3	312 CE
371 CE-3	Sanitary Engineering	3	....
354 CE-3	Reinforced Concrete (2)	3	352 CE
381 CE-2	Computer Application in Civil Engineering	2	204 GE
355 CE-3	Steel Structures	3	353 CE
322 CE-3	Soil mechanics (2)	3	221 CE
391 CE-0	Field Summer Training	....	....
Total Credits		17	

5thYear			
1st Semester			
Course #	Course Title	Credits	Pre- Requisite
462 CE-3	Surveying (2)	3	261 CE
431 CE-3	Highway Engineering	3	....
423 CE-3	Foundation Engineering	3	322 CE
113 IC-2	Islamic Culture (3)	2	....
407 GE-2	Management of Engineering Projects	2	306 GE
202 ARAB-2	Arabic Writing	2	....
491 CE-2	Graduation Project (1)	2	....
Total Credits		17	
2nd Semester			
Course #	Course Title	Credits	Pre- Requisite
114 IC-2	Islamic Culture (4)	2	....
414 CE-3	Water Resources Planning and Management	3	313 CE
432 CE-3	Transportation and Traffic Engineering	3	431 CE

472 CE-2	Environmental Engineering	3	371 CE
433 CE-2	Construction Equipment and Methods	2	....
492 CE-2	Graduation Project (2)	2	491 CE
Total Credits		15	

General University COURSE DESCRIPTION

104PHYS-4 Principles of General Physics

4 (3,2,1)

Physics and Measurement, Motion One Dimension, Vectors, Motion in Two Dimension, The laws of Motion, Circular Motion and other application of Newton's Law, Energy of a system, Conservation of Energy, Linear Momentum and Collisions, Rotation of rigid objects about a fixed axis, Angular Momentum, static Equilibrium and Elasticity.

101CHEM-3 General Chemistry

3 (3,0,0)

This course will introduce the student to the basic vocabulary used in different branches of chemistry, and to major concepts in the field (eg. Stoichiometry, thermochemistry,) with emphasis on problem solving. The course topics included general chemistry concepts. Thermochemistry, bonding, solid-state structures, fundamentals of organic chemistry including polymers. Solution chemistry, thermodynamics, kinetics, equilibrium, acids and bases, electrochemistry, and nuclear chemistry. Use of computer for data acquisition and multimedia resources. Introduction to atomic theory, chemical reactions, bonding, stoichiometry, nomenclature, gas laws, colligate properties, colloids and solutions. Oxidation-reduction reactions, kinetics. Acid and base equilibria, buffers, translation elements, solubility, complex ions, hybridization. Laboratory study of the chemical properties and semi-micro qualitative analysis of the representative group elements of the periodic table.

106MATH-3 Integral Calculus**3 (3,0,1)**

In this course, students will learn the basics of the calculus of functions of one variable. They will also apply these ideas to a wide range of problems to improve their ability to think critically, to analyse a problem and solve it using a wide array of tools. The course topics include function and graphs, polynomials, exponential, logarithmic and trigonometric functions. Limits and continuity, limits at infinity, infinite limits, properties of continuous functions, and the intermediate value theorem. The derivative, techniques of differentiation, chain rule, implicit differentiation, L'Hopital's rule, and application. Integration, definite and indefinite integral, fundamental theorem of calculus, integration by substitution, integration by parts, improper integrals, and application.

107MATH-3 Algebra & Analytical Geometry**3 (3,0,1)**

Systems of linear equations, matrices, types of matrices, algebraic of matrix, inverse of matrices, determinants, Cramer's rule. Vectors in two and three dimensions and properties of vectors, scalar (dot) and cross products. Distance formula, gradient (or slope), positive and negative slopes, Inclination, parallel and perpendicular lines, straight line general formula, perpendicular distance from a point to a line, the general formula of circle. Conic sections: the parabola, the ellipse, the hyperbola. Rectangular, polar and spherical coordinates; curves in polar coordinates. Equations of lines and planes in space, surfaces

107ENGL-3 Technical Writing for Engineers

This course will enable the student to improve his ability to write expository essays. The course topics include Investigation of topic-selection processes, development of thesis statements, outlining as it relates to support for a selected thesis statement, both in sentence and slug-style, and practice and emphasis on critical thinking skills.

203MATH-3 Advanced Calculus**3 (3,0,1)**

Infinite Sequences, Infinite series, convergence and divergence of infinite series, integral test, ratio test, root test and comparison test. Conditional convergence and absolute convergence, alternating series test. Power Series, Taylor and Maclaurin series, Vector valued functions, their limits, continuity, derivatives and integrals. Motion of particle in space, tangential and normal components of acceleration. Function in two or three variables, their limits, continuity, partial derivatives, chain Rule, directional derivatives, tangent planes and normal lines to equations, Extreme of Functions of Several Variables, Lagrange Multipliers, Double integral and its applications to area, volume, moments and centre of mass. Double integrals in polar coordinates, triple integral in rectangular, cylindrical and spherical coordinates and applications to volume, the moment and centre of mass. Vector fields, line integrals, surface integrals, Green's theorem, and the divergence theorem. Stoke's theorem

Prerequisites: 106Math-3

108ENGL-2 Communication Skills for Engineers**2 (2,0,1)**

The use of good English: gather ideas and information, to organize ideas relevantly and coherently; engage in debates; participate in group discussions; face interviews; present scientific seminars; make oral presentations; transfer information from non-verbal to verbal texts and vice versa; take part in social and professional communication

Prerequisites: 107ENG

105PHYS-4 Advanced Physics**4 (3,2,1)**

Atomic structure: electronics configuration, classification of elements, energy levels. Crystal structure: lattice, symmetry, space group, examples for simple structure. Electrical properties of materials and electricity: classification of materials. Magnetic properties of materials and magnetism. Thermal properties of materials: thermal energy, thermoelectric power (See back Effect). Mechanical properties of matter (Young's modulus, tensile materials

Prerequisites: 104 PHIS -4

204MATH-3 Differential Equations**3 (3,0,1)**

Introduction and classification, solutions of first order differential equations and their applications, (Growth and decay problems and linear motion problems). Solutions of higher order linear differential equations and their applications (spring problem and projectile problems). Laplace transforms and its applications, linear systems of differential equations. Series solutions of differential equations. Fourier series

Prerequisites: 106 Math-3

254MATH-3 Numerical Methods**3 (3,0,0)**

Types of errors, errors analysis. Numerical solutions of nonlinear equations of single variables: fixed point iteration method, bisection method, false position method, Newton-Raphson method, secant method. Numerical solutions of a system of linear equations: Gauss-Jordan iterative method. Gauss-Jordan iterative method with partial and complete pivoting. Interpolation: Lagrange interpolation formula, divided differences, Newton interpolation, Numerical differentiation. Numerical integration. Introduction to numerical solutions of ordinary differential equations

Prerequisites: 204 MATH

324STAT-3 Engineering Probability and Statistics**3 (3,0,0)**

Concepts of statistics and its applications in science and engineering, measure of central tendency, measure of dispersion, regression, correlation, and their applications. Concepts of probability and its applications in science and engineering, probability axioms, conditional probability, independent probability for events, some probability distributions and random variables: discrete and continuous random variables, distributions for applications in engineering such as Poisson and Weibull distributions and other probability distributions are important for engineers, time series, computer applications using statistical software

111ISL-2 Introduction to Islamic Culture**2 (2,0,0)**

The meaning of Islamic creed, its most important terminology and characteristics. Moderation of the people of Sunnah. Explanation of different ranks of the Islamic religion: Islam, Faith and charity. Belief in the Oneness of the lordship (Divinity) of ALLAH, Belief in the Oneness of the worship of ALLAH. Testimony that there is no god but ALLAH: its meaning, its term, its pillars, and its invalidator. Worship: definition, types, its terms and its pillars. Belief in the Oneness of the Names and the Attributes of ALLAH: Its meaning and the pathway of the people of Sunnah, and examples of some divine attributes, and the benefits of faith in Names and attributes. Warning on invalidators of belief in Oneness of ALLAH: GREAT shirk, great disbelief, and rules on clear disbelief, and signs of disbelief, and the dangers of disbelief. Great hypocrisy and

signs of hypocrites. Explanation of adulterators of belief in oneness of ALLAH: Lesser associating partners (Shirk) to of ALLAH, lesser disbelief and lesser hypocrisy. Innovation in Islamic Religion: definition, judgement, types, and examples. Definition of Loyalty and Enmity: judgement and manifestations of sanctioned loyalty, and forbidden loyalty, and the rules pertaining dealing with the disbelievers.

112ISL-2 Islamic Culture 2

2 (2,0,0)

Believes based on scientific basis and methodologies deduced from the Holy Qur'an, Biography of Prophet Muhammad, Peace be upon him (PBUH), and other well known Islamic references. The concept of ethics in Islam. The rules of Islam in dealing with instincts through ethics and moral rules.

The Islamic ethics and values necessary for their daily life. Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples. The Islamic solutions for daily life problems. Explain the effect of applying the Islamic ethics and values on community.

201ARAB-2 Language Skills

2 (2,0,0)

تعريف الكلمة: لغة واصطلاحاً. أقسام الكلمة: اسم، وفعل، وحرف. علامات الاسم: (أل) التعريف، التنوين، والحديث عنه. أقسام الاسم من حيث الإعراب والبناء: معرب، ومبني. أقسام الفعل: ماض، وأمر، ومضارع. العلامة التي يعرف بها كل فعل، وحكمه من حيث الإعراب والبناء. تعريف الكلام. صور انتلاف الكلام ست. تعريف الإعراب، وبيان أنواعه، مع بيان ما يشترك فيه الاسم والفعل، وما يختص به كل واحد منهما، وبيان العلامات الأصول والفروع. مما خرج عن الأصل في إعرابه سبعة أبواب: خمسة في الأسماء:

الأسماء الستة، المثني وما ألحق به، جمع المذكر السالم وما ألحق به، الجمع بالأنثى والتاء المزدتين وما ألحق به في حالة النصب، الممنوع من الصرف في حالة الجر.

واثنان في الأفعال:

الأفعال الخمسة، الفعل المضارع المعتل الآخر في حالة الجزم. الصرف: الميزان الصرفي-المجرد والمزيد. المعاجم: طريقة الكشف في المعاجم العربية المختلفة. الأدب والنصوص: من القرآن الكريم سورة الحجرات من أولها إلى آخر الآية رقم(12)

من الحديث الشريف: خطبة الوداع، أو بعض الأحاديث المختارة ذات التوجيه الاجتماعي والسلوكي. من الشعر والنثر: مختارات شعرية ونثرية تمثل الأدب العربي.

113ISL-2 Islamic Culture 3

2 (2,0,0)

Believes based on scientific basis and methodologies deduced from the Holy Qur'an, Biography of Prophet Muhammad, Peace be upon him (PBUH), and other well known Islamic references. The concept of ethics in Islam. The rules of Islam in dealing with instincts through ethics and moral rules.

The Islamic ethics and values necessary for their daily life. Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples. The Islamic

solutions for daily life problems. Explain the effect of applying the Islamic ethics and values on community.

202ARAB-2 Arabic Writing

اصطلاحاً. أقسام الكلمة: اسم، وفعل. وحرف تعريف الكلمة: لغة، علامات الاسم : (ال) التعريف، التنوين، والحديث عنه. أقسام الـسم من حيث الإعراب والبناء: معرب، ومبني. أقسام الفعل : ماض، وأمر، ومضارع. العالمية التي يعرف بها كل فعل، وحكمه من حيث الإعراب والبناء. تعريف الكالم. صور ائتالف الكالم ست. تعريف الإعراب، وبيان أنواعه، مع بيان ما يشترك فيه الـسم والفعل، وما يختص به كل واحد منهما، وبيان العلامات الأصول والفروع. مما خرج عن الأصل في إعرابه سبعة أبواب: خمسة في الأسماء الستة المثني وما ألحق به جمع المذكر السالم وما ألحق به الجمع بالالف والتاء المزيديتين وما ألحق به في حالة النصب الممنوع من الصرف في حالة الجر . واثنان في الأفعال: الأفعال الخمسة الفعل المضارع المعتل الآخر في حالة الجزم. الصرف : الميزان الصرفي المجرد والمزيد –المعاجم : طريقة الكشف في المعاجم العربية المختلفة. الأدب والنصوص : من القرآن الكريم سورة الحجرات من أولها إلى آخر الآية رقم 22 من الحديث الشريف : خطبة الوداع، أو بعض الأحاديث المختارة ذات التوجيه الاجتماعي والسلوكي. من الشعر والنثر : مختارات شعرية ونثرية تمثل الأدب العربي.

114ISL-2 Islamic Culture 4

2 (2,0,2)

Believes based on scientific basis and methodologies deduced from the Holy Qur'an, Biography of Prophet Muhammad, Peace be upon him (PBUH), and other well known Islamic references. The concept of ethics in Islam. The rules of Islam in dealing with instincts through ethics and moral rules.

The Islamic ethics and values necessary for their daily life. Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples. The Islamic solutions for daily life problems. Explain the effect of applying the Islamic ethics and values on community

College Courses Descriptions

101GE-3 Statics

3 (3,0,1)

Basic concepts and principles of statics. Vector operations. Equilibrium of particles in two and three dimensions. definition of moment and couple; reduction of systems forces; equilibrium of rigid bodies; statically determinate structures including beams, trusses, frames, and machines; internal forces; shear force and bending moment diagrams in beams; friction and its applications, centroid and center of gravity of lines, areas, and volumes; moment of inertia and radius of gyration.

Prerequisites: 107Math-3

102GE-2 Introduction to Engineering Design

2 (2,0,1)

Introduction to active learning, teamwork, team dynamics, team norms and communication, conducting effects meetings and quality assessment. Understanding the seven habits of highly qualified professionals. Organization of work and design notebook. Reverse engineering and design project. Computer modeling and heuristics for solving problems, stochastic process, optimization and expert systems. Schedule and time management.

204GE-3 Computer Programming for Engineers

3 (3,0,1)

Computer organization and hierarchy of programming language, Fortran 90 as a high level language, arithmetic computations, algorithm design, selection statements, repetition statements, debugging and testing of programs, logical and character data type, data files and formatted outputs, array processing, subprograms, introduction to derive data types and structures, numerical applications. Analysing and design of civil engineering structural systems through the uses of computers. Emphasis will be placed on available computer software used in engineering projects and industry in civil engineering disciplines

203GE-3 Engineering Drawing

3 (1,4,1)

Introduction to drawing, Drawing equipment and use, Skills of Freehand Sketching, Methods of Projection: Orthographic, Isometric Dimensioning of View. Third View Prediction, Primary and Successive Auxiliary Views. Intersections of Surfaces and Bodies. Development of Surfaces. Sectioning. Introduction to Assembly Drawings. Introduction to computer graphics, Engineering Applications.

205GE-3 Dynamics

3 (3,0,1)

Basic considerations (Vector operations, Newtonian mechanics), Engineering applications of virtual work, Kinematics of particles, Newton's law, Equations of motion, Work and energy, Impulse momentum, and vibrations.

Prerequisites: 101GE-3 Static

306GE-2 Engineering Economy

2 (2,0,1)

Introduction to Engineering economy. Interest formulas and equivalence. Bases for comparison of alternatives. Decision making among alternatives. Evaluating replacement alternatives. Break even and minimum cost analysis. Cost accounting. Depreciation. Economic analysis of operations. Economic analysis of public projects. Basic management process approach, strategies and planning methods, project planning and scheduling, Bar chart, critical path methods, PERT method, resource leveling and allocation, time cost trade off. Construction and organizational approaches, leadership elements and decision-making, computer applications.

407GE-2 Management of Engineering Projects**2 (2,0,1)**

Characteristics of Construction Industry; project delivery systems; the design and construction process; construction contracting; construction planning; project control, conceptual cost estimation; and Quality and Safety Management.

Prerequisites: 306GE-2

DEPARTMENTAL COURSE DESCRIPTIONS**241 CE-3 Strength of Material****3 (3, 0, 1)**

Stress, strain, and Hook's law. Moduli of elasticity and rigidity, and Poisson's ratio. Statical determination of axial force, shear force, bending moment and torque in bars, beams and circular shafts. Load-shear-moment relationship in beams. Section kinematics; strain and stress distribution and their resultants. Normal and shear stress distributions in beams of different shapes. Transformation of stress and strain, Mohr's circle. Spherical and cylindrical pressure vessels. Elastic buckling of columns

Pre-requisite: 101GE.

261CE-3 Surveying 1**3 (2, 2, 1)**

Introduction to the basic surveying theory and practice; Units of measurements and conversions; Error analysis; Distance measurements by taping; Levelling; Angle measurements; Traversing and traverse computations; Topographic surveying and mapping; Area and volume computations; Circular curves; Use of surveying software such as Wolfpack and Surfer.

221CE-3 Soil Mechanics 1**3 (2, 2, 1)**

Introduction to soil and soil mechanics, Soil composition, Soil type and structure, Index properties, Identification and Classification of soils, Site Investigation, Compaction of soils.

221 CE-3 Fluid Mechanics**3 (2, 2, 1)**

Introduction and basic concepts of fluid mechanics, fluid properties, pressure and fluid statics in immersed surfaces, stability of floating bodies, fluid kinematic, energy equation, momentum equation, flow and losses in pipes, flow measurements, and dimensional analysis

251 CE-3 Structural Analysis11**3 (3, 0, 1)**

Types of structures, supports and loads. Idealization of structures and loads. Geometric stability and determinacy. Analysis of determinate trusses, beams, plane frames and arches. Reaction computations axial force, shear force and bending moment diagrams. Internal force releases. Load-shear-moment relationship. Differential equation of elastic curve. Deflections by integration, moment-area, conjugate-beam and virtual work methods. Influence lines of determinate structures.

Pre-requisite: 241CE-3.

312 CE-3 Hydraulics**3 (2, 2, 1)**

Analysis of pipe flow networks, concepts of fluid flow, types of flow, states of flow, geometric properties of channel sections, velocity distribution in open channels, flow resistance and boundary layer theory, design of channel sections, energy considerations in open channels: specific energy and discharge diagrams, momentum considerations in open channels: specific force diagram and hydraulic jump. Gradually varied flow, hydraulic machines: pumps and turbines.

Pre-requisite: 211CE-3.

CE-3 Reinforced Concrete 1**3(3, 0, 1)**

Fundamentals and design theories based on ultimate strength design and elastic concept using ACI code. ACI Code requirements. Load factors. Analysis and design of reinforced concrete members subject to flexure, shear and diagonal tension in accordance to ACI strength method. Development length of reinforcement, deflection and crack controls in reinforced concrete members.

Pre-requisite: 241CE-3.

342 CE-3 Properties of Testing of Materials**3 (2, 2, 1)**

Methods of sieve analysis, density, absorption, and abrasion of sand and concrete aggregates. Normal consistency, setting times, compressive and tensile strengths of cements. Design and testing of concrete mixes for required workability, compressive, tensile, flexure strength and modulus of elasticity at various ages. Strength tests: on concrete cores, using Schmidt hammer and ultrasonic waves. Tensile test for reinforcing steel, and calculation of elastic modulus. Tests on isotropic and anisotropic materials and use of dial and electrical strain gages. Finding the Brinell Hardness number of various materials. Tension tests on ductile and brittle materials. Non-destructive testing on concrete.

Pre-requisite: 241CE-3

353 CE-3 Structural Analysis 2**3 (3, 0, 1)**

Analysis of indeterminate structures: trusses, beams, plane frames and arches. Method of consistent deformation and flexibility matrix formulation. Pre-strain, temperature change and support movement effects. Slope deflection method, matrix analysis of beams and plane frame using the stiffness method, moment distribution, sway consideration and analysis of non-prismatic members.

Pre-requisite: 251CE-3

313 CE-3 Hydrology**3 (2, 2, 1)**

The hydrologic cycle, Fundamentals of meteorology: (Temperature, humidity, Wind, Precipitation, Evaporation, Transpiration, and Infiltration), Stream flow and runoff, Stream flow hydrograph and Unit hydrograph, Groundwater flow, Types of aquifers and hydraulics of wells, Salt water intrusion in coastal aquifers.

Pre-requisite: 312CE-3

371 CE-3 Sanitary Engineering**3 (2, 2, 1)**

Source of water supply; quantity of water and wastewater; quality of water supply; drinking water standard; water treatment system; coagulation-flocculation; sedimentation; filtration; disinfection; softening; iron and manganese removal; taste and odour removal; collection and distribution of water; characteristics of wastewater; effluent standard; wastewater collection; wastewater treatment processes

354 CE-3 Reinforced Concrete 2

3 (3, 0, 1)

Design of one-way, two-way, ribbed and flat slabs floor systems. Design for “torsion” and “combined shear and torsion” by the strength method. Design of continuous beams. ACI moment redistribution for minimum rotation capacity. Design of columns under axial and eccentric loadings, short and long columns, staircases, and types of concrete footings.

Pre-requisite: 352CE-3

381 CE-2 Computer Application in Civil Engineering

2 (1, 2, 1)

Study different applications in civil engineering through the use of computers. Emphasis will be placed on available computer software used in engineering projects and industry in civil engineering disciplines.

Pre-requisite: 204 GE

355 CE-3 Steel Structures

3 (3, 0, 1)

Analysis and design of roof trusses. Design of tension and compression members, columns under eccentric loadings, column bases and footings. Design of beams, welded and bolted connections. Different loads on different steel bridges. Design of steel bridges beams using Influence lines.

Pre-requisite: 353CE-3

322 CE-3 Soil Mechanics 2

3 (2, 2, 1)

Principle of Effective Stress, Permeability and capillarity of soils, seepage and Flow's nets, Stress distribution of soils, Compressibility and settlement, Consolidation Behaviour, Shearing strength of soils. Lateral earth pressure and Retaining walls

Pre-requisite: 221CE-3

462 CE-3 Surveying 2

3 (2, 2, 1)

Electronic surveying measuring equipment, introduction to the application of geographic information systems (GIS) and global positioning system (GPS) for civil engineering, introduction to photogrammetry, Geometric principles, Survey camera, Photo-interpretation, Applications of photogrammetry, Plotting instruments, Remote sensing, Computer applications

Pre-requisite: 261CE-3

431 CE-3 Highway Engineering

3 (2, 2, 1)

Highway planning, design criteria and controls, cross sectional elements, sight distances, Geometric Design: horizontal and vertical alignments, intersections, Surface and Sub-surface Drainage. Highway Pavement Materials and Mix Design, Structural Design of Pavement Thickness (flexible and rigid pavement), Pavement Maintenance.

423 CE-3 Foundation Engineering**3 (3, 0, 1)**

Site exploration and selection. Types of foundations. Bearing capacity of shallow foundations. Mat Foundations. Foundation settlement. Deep foundations. Pile Foundations. Sheet pile structures. Slopes stability.

Pre-requisite: 322CE-3

491 CE-2 Graduation Projects 1**2 (2, 0, 1)**

Choosing the topic, establishing the project, literature review, preparing for/or preliminary conducting the experiments, collecting the field data & developing the mathematical / computer model if applicable, writing the first part of the project along with any preliminary findings.

At the beginning of the semester, the students propose a topic on which they are supposed to work as a group. Project students meet in class weekly, discuss their research, and screen their progresses for peer and faculty critique and suggestions. At the end of the semester, students present their thesis projects to the supervising committee.

414 CE-3 Water Resources Planning and Management**3 (3, 0, 1)**

Global water availability ,water Use by Sector, water Scarcity, water resources in Saudia Arabia , sustainable management of Water Resources, economic analysis of alternative water plans, design, and operation of water resources systems using mathematical optimization and models, linear Programming, river Basin Planning, system performance Indicators, river Basin modelling and flood Management.

Pre-requisite:313CE-3

432 CE-3 Transportation and Traffic Engineering**3 (3, 0, 1)**

Transportation systems; vehicle characteristics and human reactions; traffic flow characteristics; highway capacity analysis; intersection control and design; public transportation; urban transportation planning; parking and terminal facilities; transportation safety; intelligent transportation systems and computer applications; introduction to railways, waterways, airports, and pipelines

Pre-requisite: 431CE-3

472 CE-2 Environmental Engineering**3 (2, 0, 1)**

Environment Chemistry: Greenhouse gas, causes of global warming and climate change. Energy and Matter: classification of material flow, material balance equations. Carbon Footprint Reduction: clean energy, energy efficiency, innovative techniques to control CO₂ emissions. Pollution: Water Pollution, Air Pollution, and Noise Pollution, measurements, causes & effects and control. Solid Waste Management: reduce, reuse, and recycle, MSW landfill. Environmental Assessment Method definition, importance, main features, Well-known tools such as LEED, Case study in Saudi Arabia.

Pre-requisite: 371CE-3

433 CE-2 Construction Equipment and Methods

2 (2, 0, 1)

Overview of the construction industry. Earthmoving machinery and operations: excavation and lifting, loading & hauling, compacting & finishing, productivity estimation. Reinforced concrete construction and concrete form design. Construction economics.

492 CE-2 Graduation Projects 2

2 (2, 0, 1)

Continuation of part I of the project including : running and finalizing the experimental program or the mathematical / computer model, analysing the result, and findings and drawing the conclusion, writing the complete project report, presenting and defending the project.

Throughout the semester, the students try to implement what they proposed in graduation project-I as a group. Project students meet in class or lab weekly, segregate the work into sub-projects, and integrate the individual works in order to reach their target, and faculty critique and suggestions. At the conclusion of the semester, students present their design projects along with the thesis to the supervising committee.

Pre-requisite: 491CE-2

FACULTY AND STAFF

The Civil Engineering Department has good number of faculty members having Ph.D in different specialization in civil engineering fields. The name of the Department members with their designation are as follows:-

Table 9: Name of Faculties with Qualification and designation in Civil Engineering Department

Faculty Name	Qualification and Specialization	Designation	E mail
Abdulnoor A.J Ghanim	PhD-Civil Engineering Specialization: Water Resources Eng.	Associate Professor	aaghanim@nu.edu.sa
Ahmed Hilmy Al-Syed Othman	PhD-Civil Engineering Specialization: Groundwater & Hydrology	Professor	ahelsayed@nu.edu.sa
Aslam Amirahmad	PhD-Civil Engineering Specialization: Structural Engineering	Assistant Professor	aaahmaad@nu.edu.sa
Ibrahim Hakeem	PhD-Civil Engineering Specialization: Structural Engineering	Assistant Professor	iyhakeem@nu.edu.sa
Saleh Hamel AlSalem	PhD-Civil Engineering Specialization: Sustainability	Assistant Professor	dr.saleh.uk@gmail.com
Ismail Elkharchy	PhD-Civil Engineering Specialization: Surveying	Assistant Professor	iaelkharchy@nu.edu.sa
Abdullah A. Al-Homidy	PhD-Civil Engineering Specialization: Geotechnics	Assistant Professor	aaalhomidy@nu.edu.sa

Moustafa Abdulrahim Hassan Salih	PhD-Civil Engineering Specialization: Structural Engineering	Assistant Professor	masalihe@nu.edu.sa
Gamil Mahyoub Saif Abdullah	PhD-Civil Engineering Specialization: Pavement & Geotechnical Engineering	Assistant Professor	gmabdullah@nu.edu.sa
Ahmed Abd El Aal	PhD-Civil Engineering Specialization:Engineering Geology	Assistant Professor	akahmed@nu.edu.sa
Ahmed Moustafa Mahmood Maglad	PhD-Civil Engineering Specialization: Structural Engineering	Assistant Professor	ammaglad@nu.edu.sa
Eng. Hussain Abdullah Al Hatailah	M.Sc. in Civil Engineering Specialization: Structures	Lecturer	haalhatailah@nu.edu.sa
Eng. Mohammed Abu Saq	M.Sc. in Civil Engineering Specialization: Structures	Lecturer	ssseif@nu.edu.sa
Eng. Mana al.Mansour	M.Sc. in Civil Engineering Specialization: Structures	Teaching Assistant	miabusaq@nu.edu.sa
Eng.Abdulaziz Alshehri	B.Sc. in Civil Engineering	Teaching Assistant	
Eng. Mohammed Abu Saq	B.Sc. in Civil Engineering	Teaching Assistant	abusaq@live.com
Ayman Abdulrahman Almutlaqah	B.Sc. in Civil Engineering	Teaching Assistant	amn-1994@hotmail.com

FACILITIES (Offices, Classrooms and Laboratories):

Offices Facilities:

The civil engineering department occupies the part of three floors in the college of engineering building within Najran University campus. There are 51 offices for Faculty members, one secretariat room, one conference room, and six laboratories and one-computer lab. Each staff member has office with space ranging from 6 to 12 square meters. Office size allows enough space for individual and collective work including the possibility to hold meetings with at most two to three colleagues or students. All facilities that needed are available for each office. Sample of faculty members' office is shown in the figure below.



Figure3 : Sample of Civil Engineering faculty office

Classrooms Facilities:

The College of Engineering provides excellent teaching classrooms. Classrooms are adequately equipped with chairs and desks, instructor desk, interactive data show, and a white board. Each classroom is equipped with a wireless network allowing instructors to use internet. There are 23 classrooms available each with capacity of 30 students (Fig.4), and 2 large-size classrooms each with capacity of 60 students (Fig.5), also there are two amphitheaters with capacity of 150 students with high audio and video facilities.



Figure 4: Picture showing a typical small classroom



Figure 5: Picture showing a typical large class room

Laboratory Facilities:

Most laboratories that concern the Civil Engineering Department are available. All laboratories have adequate equipment for carrying out experimental work for courses and research activities. The available laboratories are as follows:

- a. Soil Mechanics Laboratory.
- b. Structural Materials Laboratory.
- c. Highway Engineering Laboratory.
- d. Surveying and Remote Sensing Laboratory.
- e. Water Resources & Environmental Engineering Laboratory.
- f. Computer Laboratory.
- g. Laboratory.

A.3.1 Soil Mechanics Laboratory

The Soil Mechanics Laboratory (Figure 6) is utilized to determine the geotechnical properties of soil (physical, engineering, and mechanical) and geotechnical design parameters.



Figure 6: Soil Mechanics Laboratory



Figure 7: Soil Mechanics Laboratory

A.3.2 Sanitary and Water Resources Laboratory.

The Sanitary and Water Resources Laboratory (Figure below) is used to teach concepts and perform research related to sanitary Engineering, water and wastewater reclamation and related fields. The laboratory is also utilized for research purposes.



Figure 8: Water Resources & Environmental Engineering Laboratory

A.3.3 Structural Materials Laboratory

The Concrete Quality Control and Assurance Laboratory (Figure 9 & 10) provides a wide scope of services and tests on fresh and hardened properties of concrete.



Figure 9: Structural Material Laboratory



Figure 10: Structural Material Laboratory

A.3.4 Surveying and Remote Sensing Laboratory:

The Surveying and Remote Sensing Laboratory contains surveying instruments that used to train students in the practical aspect of the Surveying courses. The laboratory contains traditional surveying instruments as tapes, surveying compass, digital Planimeters, levels (automatic, digital levels) and its accessories, and the digital Theodolites. The laboratory contains modern surveying instruments including total stations with different accuracies and Global Positioning System (GPS).

A.3.5 Highway Engineering Laboratory:

The laboratory (Figure 11) is fully equipped to provide effective support to academic and research related activities in the field of flexible pavement design and analysis for undergraduate Civil Engineering program.



Figure 11: Asphalt Laboratory

A.3.6 Computer Laboratory:

The Computer Laboratory contains 30 desktop. Engineering software packages are provided and served by Windows. All software packages are provided in every general access computer lab, available software packages are:

- Autocad
- SAP2000
- Premavira
- Ansys
- Matlab



Figure 12: Computer laboratory

DEPARTMENT COMMITTEES & UNITS

The department has several committees and units each of which is composed of a convener and at least two faculty members to assist in managing academic and administrative affairs of the department.

1. Assessment & Evaluation Committee
2. Curriculum Committee
3. Training & Graduation Project Committee
4. Surveying Committee
5. Academic Advising Committee
6. Research & Community Service Committee
7. Registration & Examination Committee
8. Student's Activity Committee
9. Ethics, Promotion, Scholarships & Employment Committee
10. Exam Review Committee
11. Accreditation & Quality Committee

INDUSRIAL ADVISORY BOARD

The CE department has established an industrial advisory board in order:

1. To give advice and direction in improving the curriculum, research and vocational courses in civil engineering so as to meet the latest state of the art of industry requirements.
2. To simplify linking the gap of academia-industry communication for the benefits of students, employers and academic staff.
3. To provide an ideal for students through advisory board communication and interaction with students.



Figure 13: Industrial Advisory Council Meetings

No.	Industrial Advisory Council	photo
1.	Associate Professor Dr. Abdullah Alwadie Dean, College of Engineering Najran University Najran, Saudi Arabia Tel: 00966 507776986 Email: asalwadie@nu.edu.sa	
2.	Engineer Hassan Salem Al Juraib General Manager University Project department Najran, Saudi Arabia Tel: 00966 556663166 Email: hasgr999@hotmail.com	
3.	Engineer Ahmad H. Alsaqir Alshahrani Najran District Director STC Najran, Saudi Arabia Tel: 00966 553282800 Email: ahsager@hotmail.com	

No.	Industrial Advisory Council	photo
4.	Engineer Erfan Hatem Al Mansoor Assistant Manager University Project department Najran, Saudi Arabia Tel: 00966 544196000 Email: ehalmansoor@hotmail.com	
5.	Engineer Raid Faisal alghadam Civil and Safety Engineer University Project department Najran, Saudi Arabia Tel: 00966 543311138 Email: ralghadam@hotmail.com	
6.	Associate Professor Abdulnoor A.J Ghanim Civil Engineering Department College of Engineering 11001 Najran, Saudi Arabia Email: aaghanim@nu.edu.sa Tel: 00966 545529898	
7.	Assist. Prof. Dr. Ibrahim Hakeem Civil Engineering Department College of Engineering 11001 Najran, Saudi Arabia Email: iyhakeem@nu.edu.sa Tel: 00966 569584746	
9.	Dr. Saleh Hamel Al-Salem Civil Engineering Department College of Engineering 11001 Najran, Saudi Arabia Email: dr.saleh.uk@gmail.com Tel: 00966 555 72 4545	

ADMISSION REQUIREMENTS & REGULATIONS FOR THE BACHELOR PROGRAMS

Admission Requirements of the college

Students who are admitted to Civil Engineering program in Najran University should satisfy the general and special requirements as follow-

General Requirement

The general requirements are enlisted as follow-

1. The students shall only be admitted to the university upon the calculation of his average on 30% in general aptitude, 30% in achievement test and 40% in general secondary education, if the students wishes to enroll in preparatory year.
2. The students should obtain the general secondary certificate or its equivalent from the kingdom or abroad.
3. Not more than two academic years should have elapsed from the date of his obtaining such certificate or its equivalent.
4. The students should have a good conduct and proper behavior.
5. The students should successfully pass exam or personal interview (when conducted).
6. The students should be medically fit.
7. The students should obtain approval from his authority to pursue his studies if he works for any governmental or private body.
8. The students should not have been expelled from Najran University or any other university for academic or disciplinary reasons.
9. After the students is admitted, if it turns out that he has already been expelled for disciplinary or academic reasons, his admission shall be considered as void.
10. Students fulfilling all the requirements should present the stipulated documents to the deanship of admission and registration of the university.
11. The enrolled student cannot be enrolled for another degree at the same university or at any other university and should not have already obtained such degree.
12. The files of students shall be ruled out if it is found that he is late for admission tests. .
13. The files of students shall be ruled out if it is found that he is late for personal interviews and unable to present a genuine reason.
14. Students, who are late in carrying out the admission procedures within the deadline set by the university and do not present an acceptable excuse to the deanship of admission and registration shall not be admitted.

The admission procedures are regulated by the “Education and Examination Regulations” available at [URLhttp://www.nu.edu.sa/en/admission-requirements?jsessionid=3B5F1C1672251709F4F35BA799549E70.s2?p_p_id=82&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&_82_struts_action=%2Flanguage%2Fview&_82_redirect=%2Fen%2Fadmission-requirements&languageId=ar_SA](http://www.nu.edu.sa/en/admission-requirements?jsessionid=3B5F1C1672251709F4F35BA799549E70.s2?p_p_id=82&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&_82_struts_action=%2Flanguage%2Fview&_82_redirect=%2Fen%2Fadmission-requirements&languageId=ar_SA)

Transfer Students and Transfer Courses

Transfer of students to civil engineering program at Najran University can be done through three different channels as follows:

Transfer from Other Universities:

General Requirements: With the consent of the administrator in charge, students may transfer from other universities in conformity with the rules adopted by the student affairs committee and according to the following general guidelines:

- The student must be enrolled at an accredited college or university.
- The student must not have been dismissed from that university for educational or disciplinary reasons.
- The student must meet the requirements of admission transfer.
- The transferred students are required to complete more than 60% of the total required credit hours in Najran University. The college council is responsible for equating the courses studied at other universities to the equivalent courses of the department and accordingly a recommendation is forwarded to the department council. The equated courses are then credited and applied to the student's academic record, but not be applied to the cumulative GPA.
- The transfer procedure should be completed within the period specified by the dean of admission and registration, provided that the period does not exceed end of the second week from the beginning of the academic semester. After the fulfilment of all requirements, the student receives a transfer notice allowing him to attend courses after the issuance of a university ID.
- The enrolment is considered void in the case of coming out that the student had been previously dismissed from a university due to disciplinary or educational reasons.

These requirements and process for accepting transfer students are governed by the Article #15.1 of the Policy on Regulations of Study and Examinations.

Additional Requirement: In addition to the above mentioned general requirements, few more requirements are set by the council of civil engineering program. These requirements may be changed each year by the approval of program council. Currently these requirements are:

- Assure the students finish successfully the Preparatory Year Program or equivalents.
- Verify the condition of specialization in Najran University.
- Transfer from the similar engineering program.
- The student should have a minimum cumulative GPA of 3.5 (out of 5.0) or equivalent from a reputed college. This is complemented with other conditions developed by the College Council on a yearly basis.

Internal Transfer from Other Colleges within the University

General Requirements: With the consent of the administrator in charge, students may transfer from one college to another within the university in conformity with the regulations adopted by the Student Affairs Committee, and according to the following guidelines:

- The Student's grade point average (GPA) should not be less than 2.0.

- The Student must not have been previously transferred during his study at the university.
- The academic period remaining must be sufficient for the completion of the graduation requirements
- The student should apply to the dean of admission and registration about his transfer from one college to another by completing the appropriate form. Upon completion of the transfer procedures, the student will receive a notification allowing him to study at the college in which they are transferred to.
- All the transfer procedures are completed within the period determined by the office of dean of admission and registration, provided that the period does not exceed the first week after beginning of an academic semester.
- All the completed courses that are transferred from one college to another are academically recorded including semester grades, and grade point average (GPA) throughout his study in the university

Additional Requirements: Few additional requirements are set by the council of civil engineering program beside the above mentioned general requirements. These requirements could be changed each year with the approval of program council. These requirements are:

- Students can apply for transfer only after studying at least one semester in the college they are registered. (Summer semester is not counted).
- Transfer from any non-science college to any college of engineering is not allowed.
- Transfer from any college that does not require preparatory year, is not allowed.

The minimum GPA for transferring from other colleges of the University to Civil Engineering program is illustrated in Table 4 below.

Table 4: The condition for transfer of student within the University

From	To	Minimum CGPA	Number of students
College of Medicine	Civil Engineering Program College of Engineering	4	According to the capacity of the department which is decided each year by the department council
College of Dentistry	Civil Engineering Program College of Engineering	4	According to the capacity of the department which is decided each year by the department council
Applied Medical Sciences	Civil Engineering Program	4	According to the capacity of the department which is

	College of Engineering		decided each year by the department council
College of Computer Science and Information Systems	Civil Engineering Program College of Engineering	4	According to the capacity of the department which is decided each year by the department council

Transfer from Any Other Program to Civil Engineering within the College

General Requirements: With the consent of the administrator in charge, students may transfer from any other program of the college to Civil Engineering within the university in conformity with the regulations adopted by the student affairs committee, and according to the following guidelines:

- The student must have spent at least one semester in their major.
- The student is not entitled to be transferred within the same college from one major to another for more than twice during their tenure in the university.
- The academic period remaining must be sufficient for completion the graduation requirements.
- All the studied courses that are transferred from one major to another are mentioned in their academic record, including any awards, semester grades, and grade point averages GPA throughout their tenure in the university.

Additional Requirements:

The minimum GPA for transferring student within the University to Civil Engineering program is illustrated in table below.

Table 5 Transfer to Civil Engineering Program from any other program of the College

From	To	Minimum CGPA	Max number of students allowing to transfer per semester
Department of Electrical Engineering	Department of Civil Engineering	4	According to the capacity of the department which is decided each year by the department council
Department of Architecture Engineering	Department of Civil Engineering	4	According to the capacity of the department which is decided each year by the department council

Visiting Student of Civil Engineering to Other Universities

A student from the program (CE) is entitled to complete some courses in another university upon the fulfillment of the following conditions:

- The student should be regular in their academic record and apply using a prescribed form available on the website: <http://www.nu.edu.sa/web/engineering-college/70>
- The college should receive the application at least two semesters earlier from their enrolment as a visitor student.
- The student must receive a prior consent from their academic institution permitting him to study as a visitor student along with the courses to be studied.
- The college is responsible to stipulate the equivalence of courses between two programs. The student would be given official letter from the Dean of Admission and Registration Affairs enabling them to begin registration.
- The studied courses must be completed at an accredited college or university.
- The courses, studied by the student outside the university, are made equivalent by considering all of its contents and the assigned credit hours must not be less than any courses included in the graduation requirements.
- The maximum number of credit hours that can be counted from other university should be less than 20% of the total credit hours required to graduate at Najran University.
- The equivalent courses for the visiting student are not considered in calculating their cumulative GPA.
- The student must provide the obtained grades to the office of dean of admission and registration within two weeks of the beginning of the academic semester. If the student fails to submit their grades, they are considered as non-attending.

Visiting Student from Other Universities to Civil Engineering Department

The student at another university is entitled to study in Najran University as a visiting student under the following conditions-

- The student should have an academic record of at least two semesters from their current university.
- The student must not have been dismissed due to disciplinary or educational reasons.
- The student must obtain a prior written consent and enlisted courses to be studied from the deanship of admission and registration of his current university in order to study as a visitor in Najran University.
- The maximum limit of academic semesters that the student is allowed to study as a visitor is 2 semesters.
- The courses the student wishes to study should be registered in accordance with the registration requirements.
- The visiting student does not receive any grants by Najran University.
- By the end of his study, the student is provided with the results obtained in the courses studied by a transcript demonstrating the attained grades.

Transfer credit

Courses, taken by the students outside the Najran University, may be transferred upon the approval from the college council. Civil engineering department or the concern department recommends on the approval of the equivalent courses along with its corresponding credit hours. The transferred equivalent courses are recorded in the student's academic profile. The equivalent credit hours are approved for only those courses in which the students has obtained a letter grade of 'C' or above. But the points of the equivalent courses are not used in the computation of CGPA of the student.

The transferred student submit an application asking for equivalent credits to the chairman of civil engineering department along with the original academic record and certified detailed description of the courses taken outside Najran University. The chairman of Civil Engineering department refers the application to the concerned academic advisor and curriculum committee for evaluation of equivalent credit. This evaluation is performed on a case-by-case basis. This evaluation is considered according to the following circumstances:-

- a) The credit hour of the course is equal or more than that of the equivalent course in Najran University.
- b) The grade of the course obtained is 'C' or above.
- c) The content of the course matches at least 80% of the same in Najran University.

After the department approves the credit transfer, the department applies for getting approval of the college council using the equivalency evaluations. After college council approves the application, it is sent to the deanship of admission and registration. The requirements and process for courses equivalency and credit transfer are governed by Article #43 of the Policy on Regulations of Study and Examinations.