Course Syllabi

All courses of the curriculum of civil engineering program are listed in the Table below. The Syllabus of all these courses according to the ABET format are provided in the following pages.

No.	Code	Title	No.	Code	Title
1	101CHM-3	General Chemistry	26	254MATH-3	Numerical Methods
2	104PHIS-4	Principles of Physics	27	342CE-3	Properties and Testing of Materials
3	106MATH-3	Introduction to Integration	28	353CE-3	Structural Analysis (2)
4	107MATH-3	Algebra & Analytical Geometry	29	306GE-2	Engineering Economy
5	107ENG-3	Technical Writing	30	313CE-3	Hydrology
6	111ISL-2	Introduction to Islamic Culture 1	31	371CE-3	Sanitary Engineering
7	101GE-3	Statics	32	354CE-3	Reinforced Concrete (2)
8	203MATH-3	Advanced Calculus	33	381CE-2	Computer Applications in Civil Engineering
9	102GE-2	Introduction to Engineering Design	34	355CE-3	Steel Structures
10	108ENG-2	Communication Skills for Engineers	35	322CE-3	Soil Mechanics (2)
11	105PHIS-4	Advanced Physics	36	462CE-3	Surveying (2)
12	112ISL-2	Introduction to Islamic Culture 2	37	431CE-3	Highway Engineering
13	204MATH-3	Differential Equations	38	423CE-3	Foundation Engineering
14	204GE-3	Computer Programming for Engineers	39	113ISL-2	Islamic Culture (3)
15	241CE-3	Strength of Materials	40	407GE-2	Management of Engineering Projects
16	261CE-3	Surveying (1)	41	202ARAB-2	Arabic Writing
17	203GE-3	Engineering Drawing	42	491CE-2	Graduation Project (1)
18	221CE-3	Soil Mechanics (1)	43	114ISL-2	Islamic Culture (4)
19	211CE-3	Fluid Mechanics	44	414CE-3	Water Resources Planning and Management
20	324STAT-3	Probabilities and Engineering Statistics	45	432CE-3	Transportation and Traffic Engineering
21	201ARAB-2	Arabic Language Skills	46	472CE-3	Environmental Engineering
22	205GE-3	Dynamics	47	433CE-2	Construction Equipments and Methods
23	251CE-3	Structural Analysis (1)	48	492CE-2	Graduation Project (2)
24	312CE-3	Hydraulics	49	391CE-0	Cooperation Field Training
25	352CE-3	Reinforced Concrete (1)			

1	Course Syllabi – ABET Format
101Chm-3 : General Chemistry	101كيم-3 : كيمياء عامة

Program/Department	Civil Engineering Program	Code	CE

1. Course code number and title	
Course Code	101Chem-3
Course Title	General Chemistry

2. Credits and contact hours	
Credit Hours	(3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Abdullah Mahmoud
Name of coordinator	Dr. Abdullah Mahmoud

4. Text book, title, author, and year	
Text Book	General Chemistry , Principles and structures, 4th Edition (1991) by John Wiley & Sons. by James E. Brady
Other supplemental materials	

. Specific course information	
atalog description	Stoichiometry Chemical Arithmetic. Gaseous state - The liquid state – Solutions - properties of the combined solutions - Chemical equilibrium - Introduction to organic chemistry: History of organic chemistry, Chemistry of carbons, homologes series, functional groups, Hydrocarbons
rerequisites	one
o-requisites	one
ndicate whether a required, elective, or selected elective	ore (Required)

. Specific goals for the course	
. Specific outcomes of instruction (student should be able to:)	
CO1	Identify the concepts and the basic principles of chemistry and its important in many different fields.
CO2	Identify the different states of matter and properties of the substance in the gas, liquid and solid state.
CO3	Calculate the pressure, volume, density and diffusion speed using gas laws.
CO4	Identify the types of solutions and methods of expressing concentration, and the law of chemical equilibrium.
CO5	Identify the basics of organic chemistry, and recognize its importance in the life.

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	Student Outcomes (SOs)											PEO				
	a	b	c	d	e	f	g	H	i	j	k	1	2	3	4	5
CO1	✓	✓									✓	✓	✓		✓	✓
CO2	✓	✓									✓	✓	✓		✓	✓
CO3	✓	✓									✓	✓	✓		✓	✓
CO4	✓	✓									✓	✓	✓		✓	✓
CO5	✓	✓									✓	✓	✓		✓	✓
	✓	✓									✓	✓	✓		✓	✓

. Brief list of topics to be covered	
lo.	Topic
opic 1.	toichiometry Chemical Arithmetic
opic 2.	aseous state - The liquid state – Solutions
opic 3.	roperties of the combined solutions - Chemical equilibrium
opic 4.	uction to organic chemistry: History of organic chemistry, Chemistry of carbons
opic 5.	omologes series, functional groups, Hydrocarbons

2	Course Syllabi – ABET Format
104PHIS -4 : Principle of Physics	104فيز-4 : مبادئ الفيزياء

Program/Department	Civil Engineering Program	Code	PHIS

1. Course number and title	
Course Code	104PHIS – 4
Course Title	Principles of Physics

2. Credits and contact hours	
Credit Hours	4 (3,2,1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Mohamed Margub Abdullah
Name of coordinator	Dr. Mohamed Margub Abdullah

4. Text book, title, author, and year	
Text Book	Serway, Raymond, "Physics for scientist and Engineers", Saunders College Publishing, 9th Edition.
other supplemental materials	

5. Specific course information		
catalog description	Vectors, Newton's Laws of Motion, Work and Energy, properties of mater, and their flow, principles of heat, Static and Dynamic electricity, Sound and Optics.	
prerequisites	None	
co-requisites	None	
indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify vectors operations.
CO2	Identify work and energy, properties of mater, and their flow.
CO3	Identify principles of heat, Static and Dynamic electricity.
CO4	Identify Properties of sounds and optics.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓	✓									✓	✓	✓		✓	✓
CO2	✓	✓									✓	✓	✓		✓	✓
CO3	✓	✓									✓	✓	✓		✓	✓
CO4	✓	✓									✓	✓	✓		✓	✓
	✓	✓									✓	✓	✓		✓	✓

7. Brief list of topics to be covered	
Topic 1	Vectors, Newton's Laws of Motion
Topic 2	Gaseous state - The liquid state – Solutions
Topic 3	properties of the combined solutions - Chemical equilibrium
Topic 4	Sound and Optics.

3	Course Syllabi – ABET Format
106Math -3 : Introduction to Integration	**106ريض-3 : مدخل لحساب التكامل**

Program/Department	**Civil Engineering Program**	**Code**	**Math**

1. Course number and title	
Course Code	106Math -3
Course Title	Introduction to Integration

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Rashad Mudhsh Hezam
Name of coordinator	Dr. Rashad Mudhsh Hezam

4. Text book, title, author, and year	
Text Book	Calculus with analytical geometry, Howard Anton, John Wiley and Sons.
other supplemental materials	Calculus and Analytic Geometry by George B. Thomas, Ross L. Finney, Addison-Wesley

5. Specific course information	
Catalog description	Integration: indefinite integral (definition, geometric meaning, basic properties). Techniques of integral: integration by parts, trigonometric substitutions, partial fractions, quadratic expressions,…etc. . Integration of certain classes of trigonometric functions. Definite integral: Riemann integral - Upper and lower sums, geometric meaning of definite integral, some properties of definite integral. Intermediate value theorem for integrals. Fundamental theorem of Calculus. Applications of the definite integral: area, volume, work, arc length. Approximations by the Trapezoidal and Simpson rules.
Prerequisites	None
Co-requisites	None
Indicate whether a required, elective, or selected elective	Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Calculate indefinite integral (definition, geometric meaning, basic properties).
CO2	Identify techniques of integral: integration by parts, trigonometric substitutions, partial fractions, quadratic expressions,…etc. Integration of certain classes of trigonometric functions.
CO3	Calculate definite integral: Riemann integral - Upper and lower sums, geometric meaning of definite integral, some properties of definite integral. Intermediate value theorem for integrals.
CO4	Identify intermediate value theorem for integrals.
CO5	Apply the definite integral on different applications: area, volume, work, arc length. Approximations by the Trapezoidal and Simpson rules.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓											✓				
CO2	✓											✓				
CO3	✓											✓				
CO4	✓											✓				
CO5	✓											✓				
	✓											✓				

7. Brief list of topics to be covered	
Topic 1	Integration: indefinite integral (definition, geometric meaning, basic properties). Techniques of integral: integration by parts, trigonometric substitutions, partial fractions, quadratic expressions,…
Topic 2	Integration of certain classes of trigonometric functions.
Topic 3	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.
Topic 4	Definite integral: Riemann integral - Upper and lower sums, geometric meaning of definite integral, some properties of definite integral
Topic 5	Intermediate value theorem for integrals. Fundamental theorem of Calculus. Applications of the definite integral: area, volume, work, arc length. Approximations by the Trapezoidal and Simpson rules.

4	Course Syllabi – ABET Format
107Math -3 : Algebra and Analytical Geometry	**107ريض-3 : الجبر والهندسة التحليلية**

Program/Department	**Civil Engineering Program**	**Code**	**Math**

1. Course number and title	
Course Code	107Math -3
Course Title	Algebra and Analytical Geometry

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Wadia Faid Hassan al- shameri
Name of coordinator	Dr. Wadia Faid Hassan al- shameri

4. Text book, title, author, and year	
Text Book	1. Elementary Linear Algebra, Bernard Kolman, MacmilanPublshing Inc. 2.Calculus with analytical geometry, Howard Anton, John Wiley and Sons.
other supplemental materials	Elementary Linear algebra (7th Edition)By: Howard Anton John Wiley & sons (1994)

5. Specific course information		
Catalog description	Systems of linear equations, matrices, types of matrices, algebraic of matrices, 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.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify Systems of linear equations, matrices, types of matrices, algebraic of matrices, inverse of matrices, determinants, Cramer's rule
CO2	Recognize Vectors in two and three dimensions and properties of vectors, scalar (dot) and cross products.
CO3	Identify 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.
CO4	Identify conic sections: the parabola, the ellipse, the hyperbola. Rectangular, polar and spherical coordinates; curves in polar coordinates
CO5	Drive equations of lines and planes in space, surfaces.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓											✓				
CO2	✓											✓				
CO3	✓											✓				
CO4	✓											✓				
CO5	✓											✓				
	✓											✓				

7. Brief list of topics to be covered	
Topic 1	Systems of linear equations, matrices, types of matrices, algebraic of matrices, inverse of matrices, determinants, Cramer's rule
Topic 2	Vectors in two and three dimensions and properties of vectors, scalar (dot) and cross products.
Topic 3	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.
Topic 4	To Understand conic sections: the parabola, the ellipse, the hyperbola. Rectangular, polar and spherical coordinates; curves in polar coordinates
Topic 5	equations of lines and planes in space, surfaces.

5	Course Syllabi – ABET Format
107ENG -3 : Technical Writing for Engineers	**107نجل-3 : الكتابة الفنية للمهندسين**

Program/Department	**Civil Engineering Program**	**Code**	**ENG**

1. Course number and title	
Course Code	107ENG-3
Course Title	Technical Writing for Engineers

2. Credits and contact hours	
Credit Hours	3 (3.0,1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assist .Prof .Dr. Abdelghafar elhasen Alamin
Name of coordinator	Assist .Prof .Dr. Abdelghafar elhasen Alamin

4. Text book, title, author, and year	
Text Book	Karen Blachard, "Writing Power 1", Persona Education, Inc. (2013)
other supplemental materials	

5. Specific course information		
Catalog description	Provide English Language instruction to enhance students' proficiency and enable them to understand the technical language offered in English as a medium of instruction. Build students' confidence and motivation through exposure to the technical language. Expose students to wide range of topics. Build knowledge of key vocabulary in their relevant field.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Write instructions of the experimental actions using imperatives.
CO2	Write and experimental report of a set format.
CO3	Write simple report from visual input and without graphs.
CO4	Write the procedure of the experiment in passive voice.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1							✓					✓	✓	✓	✓	
CO2							✓					✓	✓	✓	✓	
CO3							✓					✓	✓	✓	✓	
CO4							✓					✓	✓	✓	✓	
CO5							✓					✓	✓	✓	✓	
							✓					✓	✓	✓	✓	

7. Brief list of topics to be covered	
Topic 1.	Describe the information from a table of results.
Topic 2.	Translate tree diagrams into meaningful sentences.
Topic 3.	Write instruction and description from the visual input;
Topic 4.	Change instruction and description into report structure;

6	Course Syllabi – ABET Format
111ISL-2: Introduction to Islamic Culture1	111سلم-2 : المدخل الي الثقافة الاسلامية 1

Program/Department	Civil Engineering Program	Code	ISL

1. Course number and title	
Course Code	**111ISL-2**
Course Title	Introduction to Islamic Culture1

2. Credits and contact hours	
Credit Hours	2 Credit Hours (2, 0, 0)
Contact Hours	2 Hours

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Saud Altwijri
Name of coordinator	Dr. Saud Altwijri

4. Text book, title, author, and year	
Text Book	المدخل لدراسة علوم القرآن، محمد أبو شهبة. أصول الحديث، محمد عجاج الخطيب. تفسير السعدي. تفسير ابن كثير. الكتب الستة وشروحها. مذكرة في أصول الفقه، للشنقيطي.
other supplemental materials	

5. Specific course information	
Catalog description	-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.
Prerequisites	None
Co-requisites	None

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Consolidate the true Islamic believes of the students based on scientific basis and methodologies
CO2	Define the concept of ethics in Islam.

CO3	Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples.
CO4	Demonstrate the Islamic solutions for daily life problems.
CO5	Explain the effect of applying the Islamic ethics and values on community.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1							✓					✓	✓	✓	✓	
CO2							✓					✓	✓	✓	✓	
CO3							✓					✓	✓	✓	✓	
CO4							✓					✓	✓	✓	✓	
CO5							✓					✓	✓	✓	✓	
							✓					✓	✓	✓	✓	

7. Brief list of topics to be covered	
Topic 1	التعريف العام بمادة الثقافة الإسلامية لمحة موجزة عن آداب طالب العلم.
Topic 2	الكون في ضوء هدي الإسلام الله خالق الكون ومدبره الإنسان واقعه في – هذا الوجود.
Topic 3	العبادة مفهومها وحقيقتها مجلاتها وشمولها للدين كله أفضليتها شروطها .
Topic 4	الأخلاق مفهومها أسسها الإيمانية الاعتقادية دخول الأخلاق في القطاعات –الإنسانية المختلفة .
Topic 5	الوسائل التربوية لاكتساب مكارم الأخلاق وتنميتها والخلاص من الأمراض الخلقية.

7	Course Syllabi – ABET Format
102GE-2 : Introduction to Engineering Design	**102هعم-2 : مقدمه في التصميم الهندسي**

Program/Department	**Civil Engineering Program**	**Code**	**GE**

1. Course number and name	
Course Code	102GE-2
Course Title	Introduction to Engineering Design

2. Credits and contact hours	
Credit Hours	2 (2 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	3Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Mosab Ahmed Khaled Al-Hom
Name of coordinator	Dr. Mosab Ahmed Khaled Al-Hom

4. Text book, title, author, and year	
Text Book	Engineering Foundations and problem solving, 5th Edition, Arvid R. Eide, Ronald Jension, Larry L. Northup, Steven Mickelson, McGraw-Hill, 2008.
other supplemental materials	1. Mindess S., Young J. F and Darwin D., "Concrete", 2nd edition, Prentice- Hall Inc. Englewood Cliffs, New Jersey, 2003. 2. Neville A. M, "Properties of concrete", Longman. 3. Mehta, P. Kumar, Monteiro and J. M. Paulo, "Concrete; microstructure properties and materials", 3rd edition, McGraw-Hill, 2005. 4. "Annual book of ASTM standards, section 4, construction Vol. 4.02, concrete and aggregate.

5. Specific course information		
Catalog description	Introduction to active learning, team work, 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.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
CO1	Collect the required data for decision making.
CO2	Work in effective and dynamic teamwork.
CO3	Solve problems through the arranged methodology.
CO4	Analyze methodologies to select the ideal solution in case of several alternatives standards.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.																
CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓	✓	✓					✓				✓	✓	✓	✓	✓
CO2	✓		✓					✓	✓			✓	✓	✓	✓	✓
CO3	✓		✓		✓			✓	✓			✓	✓	✓	✓	✓
CO4	✓		✓					✓				✓	✓	✓	✓	✓
	✓	✓	✓		✓			✓	✓			✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction to active learning, team work, team dynamics, team norms and communication, conducting effects meetings and quality assessment
Topic 2.	Understanding the seven habits of highly qualified professionals.
Topic 3.	Understanding the seven habits of highly qualified professionals.
Topic 4.	Understanding the seven habits of highly qualified professionals. Organization of work and design notebook. Reverse engineering and design project.
Topic 5.	Reverse engineering and design project. Computer modeling and heuristics for solving problems, stochastic process, optimization and expert systems.
Topic 6.	Schedule and time management.

8	Course Syllabi – ABET Format
101GE-3 : Statics	101هعم-3 : استاتيكا

Program/Department	Civil Engineering Program	Code	GE

1. Course number and name	
Course Code	101GE-3
Course Title	Statics

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assistant Prof. Dr. Ibrahim Hakeem
Name of coordinator	Assistant Prof. Dr. Ibrahim Hakeem

4. Text book, title, author, and year	
Text Book	Engineering Mechanics (Statics), by Hibbeler, R. C. Publisher: Prentice Hall, 12th Edition (2010).
other supplemental materials	Engineering Mechanics: Statics, J. L. Meriam, and L. G. Kraige, John Wiley, (2010).

5. Specific course information		
Catalog description	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	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Compute the resultant of a system of concurrent forces, apply and solve equations of equilibrium.
CO2	Determine the moment and couple, reduce a system of forces and couples.
CO3	Construct complete free-body diagrams and write appropriate equilibrium equations from the free-body diagram, including the support reactions on a structure.
CO4	Calculate the forces in truss members; analyze the forces acting on the members of pin-connected frames and machines.
CO5	Compute the internal forces and moments in members and construct shear force and bending moment diagrams for rigid beams subjected to different loadings
CO6	Identify the friction and its applications.
CO7	Compute the centroid and center of gravity of lines, areas, and volumes; moment of inertia and radius of gyration.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓						✓	✓	✓	✓	✓	✓
CO2	✓				✓						✓	✓	✓	✓	✓	✓
CO3	✓				✓						✓	✓	✓	✓	✓	✓
CO4	✓				✓						✓	✓	✓	✓	✓	✓
CO5	✓				✓						✓	✓	✓	✓	✓	✓
CO6	✓				✓				✓		✓	✓	✓	✓	✓	✓
CO7	✓				✓						✓	✓	✓	✓	✓	✓
	✓				✓				✓		✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Basic concepts and principles of statics. Vector operations.
Topic 2.	Equilibrium of particles in two and three dimensions.
Topic 3.	Definition of moment and couple; reduction of systems forces; equilibrium of rigid bodies.
Topic 4.	Statically determinate structures including beams, trusses, frames, and machines; internal forces; shear force and bending moment diagrams in beams.
Topic 5.	Friction and its applications.
Topic 6.	Centroid and center of gravity of lines, areas, and volumes; moment of inertia and radius of gyration.

9	Course Syllabi – ABET Format
203MATH -3 : Advanced Calculus	203ريض-3 : التفاضل والتكامل المتقدم

Program/Department	Civil Engineering Program	Code	MATH

1. Course number and name	
Course Code	203MATH
Course Title	Advanced Calculus

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Khaled Mohamed Aly
Name of coordinator	Dr. Khaled Mohamed Aly

4. Text book, title, author, and year	
Text Book	Calculus with analytical geometry, Earl W. Swokoski, PWS . Kent.
other supplemental materials	Calculus with analytical geometry, Howard Anton, John Wiley & Sons.

5. Specific course information		
Catalog description	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, Extrema of Functions of Several Variables, Lagrange Multipliers, Double integral and its applications to area, volume, moments and center of mass. Double integrals in polar coordinates, triple integral in rectangular, cylindrical and spherical coordinates and applications to volume, the moment and center of mass. Vector fields, line integrals, surface integrals, Green's theorem, and the divergence theorem. Stoke's theorem.	
Prerequisites	106MATH-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify 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 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
CO2	Identify Conditional convergence and absolute convergence, alternating series test. Power Series, Taylor and Maclaurin series, Vector valued functions, their limits, continuity, derivatives and integrals
CO3	Define 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.
CO4	Identify Double integrals in polar coordinates, triple integral in rectangular, cylindrical and spherical coordinates and applications to volume, the moment and center of mass.
CO5	Identify Vector fields, line integrals, surface integrals, Green's theorem, and the divergence theorem. Stoke's theorem.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓											✓				
CO2	✓											✓				
CO3	✓											✓				
CO4	✓											✓				
CO5	✓											✓				
CO6	✓											✓				
CO7	✓											✓				
	✓											✓				

7. Brief list of topics to be covered	
Topic 1	understand Conditional convergence and absolute convergence, alternating series test. Power Series, Taylor and Maclaurin series, Vector valued functions, their limits, continuity, derivatives and integrals.
Topic 2	Integration of certain classes of trigonometric functions.
Topic 3	Conditional convergence and absolute convergence, alternating series test. Power Series, Taylor and Maclaurin series, Vector valued functions, their limits, continuity, derivatives and integrals.
Topic 4	Double integrals in polar coordinates, triple integral in rectangular, cylindrical and spherical coordinates and applications to volume, the moment and center of mass.
Topic 5	Vector fields, line integrals, surface integrals, Green's theorem, and the divergence theorem. Stoke's theorem.

10	Course Syllabi – ABET Format
108ENG -2 : Communication Skills for Engineers	**Communication Skills for : 2-نجل108 Engineers**

Program/Department	**Civil Engineering Program**	**Code**	**Eng.**

1. Course number and name	
Course Code	108ENG -2
Course Title	Communication Skills for Engineers

2. Credits and contact hours	
Credit Hours	2 (2, 0, 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	3 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assist . Prof . Dr. Saad Uldin
Name of coordinator	Assist . Prof . Dr. Assist . Prof . Dr. Saad Uldin

4. Text book, title, author, and year	
Text Book	Karen Blachard, "Writing Power 2", Persona Education, Inc. (2013)
other supplemental materials	

5. Specific course information		
Catalog description	Provide English Language instruction to enhance students' proficiency and enable them to understand the technical language offered in English as a medium of instruction. Build students' confidence and motivation through exposure to the technical language. Expose students to wide range of topics. Build knowledge of key vocabulary in their relevant field.	
Prerequisites	107ENG	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Write instructions of the experimental actions using imperatives;
CO2	Write and experimental report of a set format;
CO3	Expand a piece-wise continuous functions in Fourier series, Fourier sine series and Fourier cosine series with applications to engineering problems
CO4	Write the procedure of the experiment in passive voice;

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1							✓					✓	✓	✓	✓	
CO2							✓					✓	✓	✓	✓	
CO3							✓					✓	✓	✓	✓	
CO4							✓					✓	✓	✓	✓	
CO5							✓					✓	✓	✓	✓	
							✓					✓	✓	✓	✓	

7. Brief list of topics to be covered	
Topic 1	Describe the information from a table of results.
Topic 2	Translate tree diagrams into meaningful sentences.
Topic 3	Write instruction and description from the visual input;
Topic 4	Change instruction and description into report structure;

11	Course Syllabi – ABET Format
105PHIS -4 : Advanced Physics	105فيز-4 : فيزياء متقدمة

Program/Department	Civil Engineering Program	Code	PHIS

1. Course number and name	
Course Code	105PHIS -4
Course Title	Advanced Physics

2. Credits and contact hours	
Credit Hours	4 (3,2,1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	6 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Shamoun Ahmed
Name of coordinator	Dr. Shamoun Ahmed

4. Text book, title, author, and year	
Text Book	Serway, Raymond, " Physics for scientist and Engineers", Saunders College Publishing, Last Edition.
other supplemental materials	

5. Specific course information		
Catalog description	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 (Seebeck Effect). Mechanical properties of matter (Young's modulus, tensile materials). The experiments required for 105 Phys. (Advanced physics): 1.Decay of current in a RC circuit; 2. LCR circuit. 3.Amplifiers ; 4.Cicuit in series and in parallel (with Ohm's law). 5.Solar cell 6.Stefan-Boltzman's law 7.Magnetic field along the axis of coils 8.Thermal properties materials 9. Spring Constant (Hook's law).	
Prerequisites	Phys 104	
Co-requisites	-	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify the basic principles of Electricity, Magnetism and mechanical properties of materials
CO2	Identify the correlation between the atomic structure or crystal structure and the properties of the materials.

CO3	Design circuits, and calculate load on building.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓	✓									✓	✓	✓		✓	✓
CO2	✓	✓									✓	✓	✓		✓	✓
CO3	✓	✓									✓	✓	✓		✓	✓
	✓	✓									✓	✓	✓		✓	✓

7. Brief list of topics to be covered	
Topic 1.	Atomic structure: electronics configuration, classification of elements, energy levels.
Topic 2	Crystal structure: lattice, symmetry, space group, examples for simple structure
Topic 3	Electrical properties of materials and electricity: classification of materials.
Topic 4	Thermal properties of materials: thermal energy, thermoelectric power (Seebeck Effect).
Topic 5	Sound and Optics.
Topic 6	Mechanical properties of matter (Young's modulus, tensile materials).

12	Course Syllabi – ABET Format
112ISL-2 : Introduction to Islamic Culture (2)	112سلم-2 : ثقافة إسلامية (2)

Program/Department	Civil Engineering Program	Code	112ISL-2

1. Course number and name	
Course Code	112ISL-2
Course Title	Introduction to Islamic Culture (2)

2. Credits and contact hours	
Credit Hours	2 Credit Hours (2, 0, 0)
Contact Hours	2 Hours

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Saud Altwijiri
Name of coordinator	Dr. Saud Altwijiri

4. Text book, title, author, and year	
Text Book	المدخل لدراسة علوم القرآن، د .محمد أبو شهبة. أصول الحديث، د .محمد عجاج الخطيب. تفسير السعدي. تفسير ابن كثير. الكتب الستة وشروحها. مذكرة في أصول الفقه، للشنقيطي.
other supplemental materials	

5. Specific course information		
Catalog description	-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.	
Prerequisites	111ISL-2	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Consolidate the true Islamic believes of the students based on scientific basis and methodologies.
CO2	Define the concept of ethics in Islam.

CO3	Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples.
CO4	Demonstrate the Islamic solutions for daily life problems.
CO5	Explain the effect of applying the Islamic ethics and values on community.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1							✓					✓	✓	✓	✓	
CO2							✓					✓	✓	✓	✓	
CO3							✓					✓	✓	✓	✓	
CO4							✓					✓	✓	✓	✓	
CO5							✓					✓	✓	✓	✓	
							✓					✓	✓	✓	✓	

7. Brief list of topics to be covered	
Topic 1	أولاً :القرآن الكريم: بيان معنى القرآن وإنه كلام الله حقيقة منزلة غير مخلوق. نزوله الغرض من إنزاله حكمة نزوله منجماً جمعه وتدوينه ثبوت نصه علمياً– – – – . فكرة عامة عن القراءات العشر مع المراد من قول الرسول(أنزل القرآن على سبعة أحرف) دفع شبهات أعداء الإسلام حول القرآن (كالتشكيك بحدوث الوحي، والتشكيك بصحة بعض القراءات الثابتة وغير ذلك.) مضمونه وما اشتمل عليه من موضوعات. قيمته ومكانته باعتباره المصدر الأول للإسلام.
Topic 2	ثانياً :دراسة متأنية عميقة لسورة أو أكثر من القرآن وذلك بشكل يشد الطلاب إلى كتاب الله، ويحببهم فيه، ويبرز لهم روائعه الفكرية والعلمية ومضامينه التوجيهية والإصلاحية للأفراد والمجتمعات، وهدايته المثلى إلى سعادة الدنيا وسعادة الآخرة، مع العناية ببيان الوحدة الموضوعية. للسورة، للمدرس أن يختار من سور القرآن إحدى السور التالية أو ما يعادلها مما يراه محققاً للهدف (:النور، التوبة، آل عمران، الأنعام، الرعد)ويكون من تفسير (تيسير الكريم الرحمن في تفسير كلام المنان) للشيخ عبد الرحمن السعدي
Topic 3	ثالث اً :السنة: ما تشتمل عليه من أقوال الرسول وأفعاله (سيرته) وتقريراته (حياة الصحابة معه) معاني الحديث والخبر والأثر– والحديث القدسي. منهج المسلمين الدقيق في تحقيق الحديث وتحري صحته ونفي الدخيل عنه، تدوين الحديث مع التركيز على دفع شبهات أعداء الإسلام حول ذلك.
Topic 4	رابعاً :الإجماع: تعريفه، حجيته، أدلته، فكرة عامة موجزة عنه، كون القرآن والسنة هما الأساس له في الحقيقة.
Topic 5	خامساً :الاجتهاد: تعريفه، شروطه، من هم أهل الاجتهاد ؟
Topic 6	سادساً :دراسة لطائفة من أحاديث الرسول ينتقيها المدرس من صحاح الأحاديث التي تشتمل على أمهات أصول الإسلام مع تجديد الانتقاء من سنة لأخرى، ويحسن أن يراعي في انتقاءها أن تكون مشتملة على جوانب العقيدة والتربية ونماذج من تشريع الإسلام الاقتصادي والسياسي والاجتماعي والأخلاقي والدعوة إلى نشر الإسلام والجهاد في سبيل الله.

13	Course Syllabi – ABET Format
204MATH -3 : Deferential equations	204ريض-3 : معادلات تفاضلية

Program/Department	Civil Engineering Program	Code	MATH

1. Course number and name	
Course Code	204MATH -3
Course Title	Deferential equations

2. Credits and contact hours	
Credit Hours	3 (3,0,1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assist .Prof .Dr. Mohammed Abdulkawi
Name of coordinator	Assist .Prof .Dr. Mohammed Abdulkawi

4. Text book, title, author, and year	
Text Book	Erwin Kreyszig; Herbert Kreyszig; Edward J. Norminton (2010), "Advanced Engineering Mathematics", John-Wily
other supplemental materials	

5. Specific course information		
Catalog description	The course introduces basic concepts, theorems and knowledge of the linear algebra of matrices, special functions, Fourier analysis and partial differential equations with application to engineering problems. Matrices and Vectors, linear system of equations (Gauss Eliminations) - Determinates, Crammer rule, inverse of matrix Gauss, Jordan elimination - Introduction to vector differential calculus, Dot product and Cross product - Vector differential calculus, Gradient, Divergence and Curl of a vector field) - Special function, Gamma function, Beta function - Introduction to Fourier analysis, Fourier series, Fourier sine series, Fourier cosine series - Partial differential equations, Classifications and methods of solution, heat equation, wave and potential equation.	
Prerequisites	106MATH-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Solve linear systems of linear algebraic equations.
CO2	Solve integrals related to Gamma and Beta functions.
CO3	Expand a piece-wise continuous functions in Fourier series, Fourier sine series and Fourier cosine series with applications to engineering problems.
CO4	Solve PDEs (especially heat, wave and potential partial differential equations) with applications with applications to engineering problems

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓											✓				
CO2	✓											✓				
CO3	✓											✓				
CO4	✓											✓				
	✓											✓				

7. Brief list of topics to be covered	
Topic 1	Fourier analysis and Partial Differential Equations.
Topic 2	Matrices and linear systems.
Topic 3	Determinants.
Topic 4	Applications on Partial Differential Equations.

14	Course Syllabi – ABET Format
203GE -3 : Engineering Drawing	**203هعم-3 : الرسم الهندسي**

Program/Department	**Civil Engineering Program**	**Code**	**GE**

1. Course number and name	
Course Code	203GE -3
Course Title	Engineering Drawing

2. Credits and contact hours	
Credit Hours	3 (1 , 4 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Mohamed Magdy Hamed
Name of coordinator	Dr. Mohamed Magdy Hamed

4. Text book, title, author, and year	
Text Book	1. Engineering drawing, Mahmoud S. Zaamout and Hani Al- Hakim 2. Engineering Drawing and Design by Cecil Howard Jensen, Jay D. Helsel Glencoe McGraw Hill, 5th edition, 1997. 3. Engineering Drawing and Graphic Technology by Thomas E. French, et al McGraw-Hill Higher Education, 14th edition, 1993. 4. Principles of Engineering Drawing : by Louis Gary Lamit, Kathleen L. Kitto Delmar Learning, 1st edition, 1994
other supplemental materials	Mastering AutoCAD Civil 3D by James Wedding P.E., Scott McEachron, Wiley Publishing, Inc, 2009

5. Specific course information		
Catalog description	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.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify the sketching skills and drawing techniques and implement orthographic projection.
CO2	Implement pictorial drawing and carry out sectioning for different types of objects.
CO3	apply computer drawing (AutoCAD software).

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓					✓	✓		✓		✓	✓	✓	✓	✓	✓
CO2	✓					✓	✓		✓		✓	✓	✓	✓	✓	✓
CO3	✓					✓	✓		✓		✓	✓	✓	✓	✓	✓
	✓					✓	✓		✓		✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction to drawing, Drawing equipment and use.
Topic 2.	Skills of Freehand Sketching, Methods of Projection.
Topic 3.	Orthographic, Isometric Dimensioning of View.
Topic 4.	View Prediction, Primary and Successive Auxiliary Views.
Topic 5.	Third Intersections of Surfaces and Bodies. Development of Surfaces**.**
Topic 6.	Sectioning. Introduction to Assembly Drawings**.**
Topic 7.	Introduction to computer graphics, Engineering Applications.

15	Course Syllabi – ABET Format
241CE -3 : Strength of materials	241همد-3 : مقاومة مواد

Program/Department	Civil Engineering Program	Code	CE

1. General Information	
Course Code	241CE -3
Course Title	Strength of materials

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Fathy Ahmed Elnaggar
Name of coordinator	Dr. Fathy Ahmed Elnaggar

4. Text book, title, author, and year	
Text Book	R. C. Hibbler, "Mechanics of Materials", Persona- Prentice Hall 8th edition 2011
other supplemental materials	1. Ansel C. Ugural, "Mechanics of Materials", John Willey & Sons. 2. Ferdinand P. Beer, E. Russell Johnston, John T. De Wolf, "Mechanics of Materials", McGraw- Hill Higher Education.

5. Specific course information		
Catalog description	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.	
Prerequisites	101GE -3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Analyze and Design a member for Axial Loads and Direct Shear
CO2	Investigate an Applications of Plane Stress
CO3	Analyze and Design of Circular Shaft Under Uniform and non-uniform Torques.
CO4	Analyze and Design of Beams for Bending Stresses
CO5	Investigate Columns Buckling and Stability for different types of support

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓						✓	✓	✓	✓	✓	✓
CO2	✓				✓						✓	✓	✓	✓	✓	✓
CO3	✓				✓						✓	✓	✓	✓	✓	✓
CO4	✓				✓						✓	✓	✓	✓	✓	✓
CO5	✓				✓						✓	✓	✓	✓	✓	✓
	✓				✓						✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Normal stress and strain, linear elasticity, Hooke's law, and Poisson's ratio, shear stress and strain.
Topic 2.	Torsional deformations of a circular bar of linearly elastic materials.
Topic 3.	Pure bending and non-uniform bending, curvature of beam.
Topic 4.	Normal stress in beams (linearly elastic materials).
Topic 5.	Principal stresses and maximum shear stresses, Mohr's circle for plane stress.
Topic 6.	Deflection of beam and differential equations of the deflection curve**.**
Topic 7.	Columns buckling and stability.

16	Course Syllabi – ABET Format
261CE -3 : Surveying 1	261همد-3 : مساحة 1

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	261CE -3
Course Title	Surveying 1

2. Credits and contact hours	
Credit Hours	3 (2 , 2, 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assoc. Prof. Dr. Ashraf AlyElkoushy
Name of coordinator	Assoc. Prof. Dr. Ashraf AlyElkoushy

4. Text book, title, author, and year	
Text Book	Elementary Surveying (12 eddition 2008) by Paul C. Brinker, ISBN-0-13-208307- 8978-0-13-208307-2.
other supplemental materials	Barry F. K. and Gelnnbind, S.J. "Surveying, principles and Applications', Last Edition. Prentice Hall.

5. Specific course information		
Catalog description	Introduction to the basic surveying theory and practice; Units of measurements and conversions; Error analysis ; Distance measurements by taping; Leveling ; 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.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Explain surveying Fundamental.
CO2	Apply different techniques for surveying observations, such as distance, elevations, and angles.
CO3	Analyze and calculate the unknown surveying parameters, and map productions.
CO4	Calculate area and volume from ground data and maps.
CO5	Design of simple circular curve, and stake out by using surveying instruments.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓						✓	✓	✓	✓	✓	✓
CO2	✓				✓						✓	✓	✓	✓	✓	✓
CO3	✓				✓						✓	✓	✓	✓	✓	✓
CO4	✓				✓						✓	✓	✓	✓	✓	✓
CO5			✓								✓	✓	✓	✓	✓	✓
	✓		✓		✓						✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction
Topic 2.	Principles of Survey Observations and Errors
Topic 3.	Distance Measurement
Topic 4.	Leveling Principles and Practical Aspects
Topic 5.	Areas and Volumes
Topic 6.	Lay out of Horizontal and vertical curves.
Topic 7.	Electronic measurements: Electrical measurements theory and field application
Topic 8.	Traversing
Topic 9.	Use of Surveying software such as Wolfpack and Surfer

17	Course Syllabi – ABET Format
204GE -3 : Computer programming for Engineers	**204هعم-3 : برمجة الحاسب للمهندسين**

Program/Department	Civil Engineering Program	Code	GE

1. Course number and name	
Course Code	204GE -3
Course Title	Computer programming for Engineers

2. Credits and contact hours	
Credit Hours	3(2,2,1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Mohamed Shahed Akond
Name of coordinator	Dr. Mohamed Shahed Akond

4. Text book, title, author, and year	
Text Book	1. Elliot B. Koffman and Frank L. Friedman. 1993. FORTRAN with Engineering Applications. 5th Edition. 2. Daniel D. McCraacken and William I. Salmon. 1988. Computer for Engineering and Scientists with FORTRAN 77. 2nd Edition.
other supplemental materials	

5. Specific course information		
Catalog description	Students are to be exposed to computer organization and hardware concepts, Programming languages, FORTRAN programming.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Define Fundamentals of Fortran 90 Computer language, properties and its symbol.
CO2	Design Arithmetic computations and algorism in Fortran language.
CO3	Using repetition statements and logical character data type statements in Fortran language.
CO4	Array processing & introduction to derive data types and formatted outputs.
CO5	Using data files and formatted outputs in Fortran language.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1											✓	✓	✓		✓	✓
CO2											✓	✓	✓		✓	✓
CO3											✓	✓	✓		✓	✓
CO4											✓	✓	✓		✓	✓
CO5											✓	✓	✓		✓	✓
											✓	✓	✓		✓	✓

7. Brief list of topics to be covered	
Topic 1	Computer organization and hierarchy of programming language, Fortran 90 as a high level language.
Topic 2	arithmetic computations,
Topic 3	algorithm design.
Topic 4	selection statements, repetition statements.
Topic 5	debugging and testing of programs
Topic 6	logical and character data type, data files and formatted outputs
Topic 7	array processing, subprograms
Topic 8	introduction to derive data types and structures, numerical applications
Topic 9	Analyzing and design of civil engineering structural systems through the uses of computers.

18	Course Syllabi – ABET Format
221CE-3 : Soil Mechanics (1)	221همد-3 : ميكانيكا التربة 1

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	221CE-3
Course Title	Soil Mechanics 1

2. Credits and contact hours	
Credit Hours	3 (2 , 2 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Associate Professor Ammar Rouaiguia
Name of coordinator	Associate Professor Ammar Rouaiguia

4. Text book, title, author, and year	
Text Book	Arnold Verruijt, "Soil Mechanics ", Publisher: Delft University of Technology (2006).
other supplemental materials	Braja M. Das (2009), " Principles of Geotechnical Engineering, 7th Edition.

5. Specific course information	
Catalog description	Introduction to soil and soil mechanics, Soil composition, Soil type and structure, Index properties, Identification and Classification of soils, Site Investigation, Compaction of soils.
Prerequisites	None
Co-requisites	None
Indicate whether a required, elective, or selected elective	Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify soil mechanics.
CO2	Identify and express the importance of soil mechanics and soil formation.
CO3	Apply principles of soil classification.
CO4	Apply principles of soil compaction and soil permeability.
CO5	Conduct experiment, analyze and interpret.
CO6	Analyze site investigation.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓						✓	✓	✓	✓	✓	✓
CO2	✓				✓						✓	✓	✓	✓	✓	✓
CO3	✓				✓						✓	✓	✓	✓	✓	✓
CO4	✓				✓						✓	✓	✓	✓	✓	✓
CO5	✓	✓			✓						✓	✓	✓	✓	✓	✓
CO6	✓	✓			✓						✓	✓	✓	✓	✓	✓
	✓	✓			✓						✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction to soil mechanics
Topic 2.	Formation and fields of application of soil mechanics
Topic 3.	Basic Terminology and applications
Topic 4.	Consistency limits (Atterberg Limits)
Topic 5.	Particle size distribution of soils
Topic 6.	Classification of soils

19	Course Syllabi – ABET Format
221CE-3 : Fluid Mechanics	211همد-3 : ميكانيكا الموائع

Program/Department	Civil Engineering Program	Code	CE

1. Course number and Title	
Course Code	211CE-3
Course Title	Fluid Mechanics

2. Credits and contact hours	
Credit Hours	3 (2 , 2 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assist. Prof. Dr. Gamil M.S. Abdullah
Name of coordinator	Assist. Prof. Dr. Gamil M.S. Abdullah

4. Text book, title, author, and year	
Text Book	Bruce. R. Munson, Donald. F. Young, Theodore. H. Okiishi, and Wade. W. Huebsch. (2009). Fundamentals of Fluid Mechanics, six Edition, John wiley& Sons, Inc.
other supplemental materials	Yunus. A. Cengel and John M. Cimbala (2006), "FLUID MECHANICS: Fundamentals and Applications", Published by McGraw-Hill

5. Specific course information	
Catalog description	Introduction and basic concepts of fluid mechanics. Fluid properties. Nature of ideal and real fluid flow in pipes. Pressure and fluid statics in immersed surfaces. Fluid Kinematics. Fluid measurements, stability of floating bodies, continuity equation, Analysis of pipe networks and loses of pipe flow, momentum and energy equations. Bernoulli's equation. Dimensional analysis.
Prerequisites	None
Co-requisites	None
Indicate whether a required, elective, or selected elective	Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Idetify the physical properties and characteristic behavior of fluids
CO2	Apply the concept of hydrostatics to determine the forces on surfaces
CO3	Analyze buoyancy and stability of floating and submerged objects
CO4	Apply mass conservation, energy conservation and momentum conservation principles
CO5	Solve single and networked pressure pipe flows
CO6	Demonstrate the use of dimensionless analysis to derive dimensionless numbers used in hydraulic engineering problems.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓						✓	✓	✓	✓	✓	✓
CO2	✓				✓						✓	✓	✓	✓	✓	✓
CO3	✓				✓						✓	✓	✓	✓	✓	✓
CO4	✓				✓						✓	✓	✓	✓	✓	✓
CO5	✓				✓						✓	✓	✓	✓	✓	✓
CO6	✓				✓						✓	✓	✓	✓	✓	✓
	✓				✓						✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction to the basic concept of the fluid mechanic and fluid properties (density, specific weight, specific gravity, viscosity and surface tension).
Topic 2.	Pressure and its Measurement and hydrostatic Forces on Surfaces
Topic 3.	Buoyancy and Archimedes' Principle
Topic 4.	Fluid Kinematics and continuity, energy and momentum equations
Topic 5.	Steady flow in pipe and analysis of pipe networks
Topic 6.	Similitude and dimensional analysis

20	Course Syllabi – ABET Format
324STAT-3 : Engineering Statistics & Probability	324إحص-3 : الاحتمالات والإحصاء الهندسية

Program/Department	Civil Engineering Program	Code	STAT

1. Course number and Title	
Course Code	324STAT-3
Course Title	Engineering Statistics & Probability

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. AlHadi Ebrahiem
Name of coordinator	Dr. AlHadi Ebrahiem

4. Text book, title, author, and year	
Text Book	R. E Walpole , R.H. Myers Probability and Statistics for Engineers and Scientists Macmillan Publishing 1998.
other supplemental materials	W. Mendenhall and T Sincich, Statistics for engineers and Scientists, Prentice Hall, Fourth Edition, 1995

5. Specific course information		
Catalog description	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 Poison and Weibull distributions and other probability distributions are important for engineers, time series, computer applications using statistical software.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Compute the means for collected data and know their characteristics.
CO2	Identify the measures of central tendency and dispersion and the use of these measures in analyzing data.
CO3	Identify the relationship between variables and apply it in research area.
CO4	Identify the concepts and the basic principles of probability and its important in many different fields

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓										✓	✓	✓		✓	✓
CO2	✓										✓	✓	✓		✓	✓
CO3	✓										✓	✓	✓		✓	✓
CO4	✓										✓	✓	✓		✓	✓
	✓										✓	✓	✓		✓	✓

7. Brief list of topics to be covered	
Topic 1.	Concepts of statistics and its applications in science and engineering, measure of central tendency, measure of dispersion, regression, correlation, and their applications.
Topic 2.	Concepts of probability and its applications in science and engineering, probability axioms.
Topic 3.	Conditional probability, independent probability for events, some probability distributions and random variables: discrete and continuous random variables.
Topic 4.	Distributions for applications in engineering such as Poison and Weibull distributions.
Topic 5.	Other probability distributions are important for engineers, time series, computer applications using statistical software.

21	Course Syllabi – ABET Format
201ARAB-2 : Arabic Language Skills	201عرب-2 : المهارات اللغوية

Program/Department	Civil Engineering Program	Code	ARAB

1. Course number and name	
Course Code	201ARAB-2
Course Title	Arabic Language Skills

2. Credits and contact hours	
Credit Hours	2 (2 , 0 , 0) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	2 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Saleh Salem Alharthy
Name of coordinator	Dr. Saleh Salem Alharthy

4. Text book, title, author, and year	
Text Book	1. شرح قطر الندي وبل الصدي لابن هشام 2. شذا العرف في فن الصرف للحملاوي
other supplemental materials	

5. Specific course information		
Catalog description	تعريف الكلمة: لغة واصطلاحا. أقسام الكلمة: اسم، وفعل، وحرف. علامات الاسم: (أل) أقسام الاسم من حيث الإعراب والبناء: معرب، ومبني. التعريف، التنوين، والحديث عنه. أقسام الفعل: ماض، وأمر، ومضارع. العلامة التي يعرف بها كل فعل، وحكمه من حيث الإعراب والبناء. تعريف الكلام. صور ائتلاف 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 , المثنى وما ألحق به, جمع المذكر السالم وما ألحق به, الجمع بالألف والتاء المزيدتين وما ألحق به في حالة النصب, الممنوع من الصرف في حالة الجر. واثنان في الأفعال: الأفعال الخمسة, الفعل المضارع المعتل الاخر في حالة الجزم. الصرف: الميزان الصرفي–المجرد والمزيد. المعاجم: طريقة الكشف في المعاجم العربية المختلفة. الأدب والنصوص: من القرآن لكريم سورة الحجرات من أولها إلى آخر الآية رقم(12) من الحديث الشريف: خطبة الوداع، أو بعض الأحاديث المختارة ذات التوجيه الاجتماعي من الشعر و النثر: مختارات شعرية ونثرية تمثل الأدب العربي. والسلوكي.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Apply essential Arabic grammar necessary for daily life communications.
CO2	Enhance the expression's style using examples of the Holy Qur'an, Hadeeth (sayings and actions) of Prophet Muhammad (PBUH), and famous poems.
CO3	Enhance the student's communication skills in their mother tongue.
CO4	Recognize the importance of Arabic language as the language of Islamic civilization

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1							✓					✓	✓	✓	✓	
CO2							✓					✓	✓	✓	✓	
CO3							✓					✓	✓	✓	✓	
CO4							✓					✓	✓	✓	✓	
							✓					✓	✓	✓	✓	

7. Brief list of topics to be covered	
Topic 1.	تعريف الكلمة: لغة واصطلاحا. أقسام الكلمة: اسم، وفعل، وحرف.
Topic 2.	علامات الاسم: (أل) التعريف، التنوين، والحديث عنه. أقسام الاسم من حيث الإعراب والبناء: معرب، ومبني.
Topic 3.	أقسام الفعل: ماض، وأمر، ومضارع. العلامة التي يعرف بها كل فعل، وحكمه من حيث الإعراب والبناء.
Topic 4.	تعريف الكلام. صورائتلاف الكلام ست. تعريف الإعراب، وبيان أنواعه، مع بيان ما يشترك فيه الاسم والفعل، وما يختص به كل واحد منهما، وبيان العلامات الأصول والفروع.
Topic 5.	مما خرج عن الأصل في إعرابه سبعة أبواب: خمسة في الأسماء : الأسماء الستة , المثنى وما ألحق به, جمع المذكر السالم وما ألحق به, الجمع بالألف والتاء المزيدتين وما ألحق به في حالة النصب, الممنوع من الصرف في حالة الجر. واثنان في الأفعال: الأفعال الخمسة, الفعل المضارع المعتل الاخر في حالة الجزم.
Topic 6.	الصرف: الميزان الصرفي–المجرد والمزيد
Topic 7.	المعاجم: طريقة الكشف في المعاجم العربية المختلفة
Topic 8.	الأدب والنصوص: من القرآن لكريم سورة الحجرات من أولها إلى آخر الآية رقم(12) من الحديث الشريف: خطبة الوداع، أو بعض الأحاديث المختارة ذات التوجيه الاجتماعي والسلوكي. من الشعر و النثر: مختارات شعرية ونثرية تمثل الأدب العربي.

22	Course Syllabi – ABET Format
205GE-3 : Dynamics	205هعم-3 : ديناميكا

Program/Department	Civil Engineering Program	Code	GE

1. Course number and name	
Course Code	205GE-3
Course Title	Dynamics

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. FathyElnaggar
Name of coordinator	Dr. FathyElnaggar

4. Text book, title, author, and year	
Text Book	Engineering Mechanics: Dynamics, by R. C. Hibbeler, 12th Edition in SI Units, Prentice Hall 2010
other supplemental materials	1. Bedford, A., and Fowler, W., Engineering Mechanics: Dynamics, Prentice Hall,Fourth Edition, 2005. 2. J.L. Meriam and L.G. Kraige, "Engineering Mechanics, Dynamics, , SI Version", Last Edition.

5. Specific course information		
Catalog description	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.	
Prerequisites	101GE -3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Investigate motion of a particle along straight line and curved path.
CO2	Analyze the accelerated motion of a particle using the equation of motion
CO3	Apply the principle of work and energy for particle.
CO4	Apply the conservation of momentum law in collision.
CO5	Solve problems to explain the difference between elastic and inelastic impact.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓						✓	✓	✓	✓	✓	✓
CO2	✓				✓						✓	✓	✓	✓	✓	✓
CO3	✓				✓						✓	✓	✓	✓	✓	✓
CO4	✓				✓						✓	✓	✓	✓	✓	✓
CO5	✓				✓						✓	✓	✓	✓	✓	✓
	✓				✓						✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction to dynamics and review for vectors and units.
Topic 2.	Kinematics of particle-Rectilinear motion
Topic 3.	Curvilinear linear motion
Topic 4.	Motion of projectile
Topic 5.	Newton's laws and equations of motion
Topic 6.	Work and energy
Topic 7.	Principle of impulse and momentum for a particle. Principle of Linear Impulse and Momentum for a System of Particles
Topic 8.	Impact

23	Course Syllabi – ABET Format
251CE-3 : Structural Analysis I	251همد-3 : تحليل انشائي 1

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	251CE-3
Course Title	Structural Analysis I

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Eng. Ahmad Malkawi
Name of coordinator	Eng. Ahmad Malkawi

4. Text book, title, author, and year	
Text Book	"Structural Analysis", 7th edition, 2009 Person Education South Asia Pte Ltd, by Russell C. Hibbeler
other supplemental materials	Kenneth Leet, Chia-Ming Uang, "Fundamentals of Structural Analysis", McGraw-Hill Professional, Last Edition.
	Thomas Henry Gordon Megson, "Structural and Stress Analysis", Butterworth-Heinemann, Last Edition.
	R. C. Coates, M. G. Coutie, F. K. Kong, "Structural Analysis", Taylor & Francis, Last Edition.

5. Specific course information	
Catalog description	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.
Prerequisites	241CE-3
Co-requisites	None
Indicate whether a required, elective, or selected elective	Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Define and classify structures into determinate, indeterminate, stable and unstable.
CO2	Analyze different types of determinate structures under various loading conditions.
CO3	Compute internal loads and construct its diagrams.
CO4	Construct the influence lines of statically determinate structures.
CO5	Compute slope and displacement of different types of determinate structures.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓							✓	✓	✓	✓	✓
CO2	✓				✓							✓	✓	✓	✓	✓
CO3	✓				✓							✓	✓	✓	✓	✓
CO4	✓				✓							✓	✓	✓	✓	✓
CO5	✓				✓							✓	✓	✓	✓	✓
	✓				✓							✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Types of structures, supports and loads
Topic 2.	Analysis of statically determinate structures
Topic 3.	Analysis of statically determinate truss
Topic 4.	Internal loadings in structural members
Topic 5.	Influence lines for statically determinate structures
Topic 6.	Deflection methods (Integration, moment-area, conjugate beam and virtual work)

24	Course Syllabi – ABET Format
312CE-3: Hydraulics	312همد-3 : هيدروليكا

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	312CE-3
Course Title	Hydraulics

2. Credits and contact hours	
Credit Hours	3(2,2,1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assoc. Prof. Dr. Dr. Abdulnour Ghanim
Name of coordinator	Assoc. Prof. Dr. Dr. Abdulnour Ghanim

4. Text book, title, author, and year	
Text Book	Open Channel Hydraulics, Ven-Te-Chow, McGraw-Hill Book Co.,2009
other supplemental materials	Open Channel Hydraulics, Sturm, Terry W., McGraw-Hill Series in Water Resources and Environmental Engineering, 2009.
	The Hydraulics of Open Channel flow: An Introduction. Hubert Chanson, Second Edition, Elsevier-Butterworth- Heinemann, 2004.

5. Specific course information		
Catalog description	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, unsteady rapidly varied flow, hydraulic machines: pumps and turbines. Experimental training.	
Prerequisites	211CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify the basic principles and properties of open channels flow and their applications in open channels flow problems.
CO2	Apply the principles of specific energy and momentum to analysis of transition problems in open channels.
CO3	Analyze and design open channels sections for uniform and non-uniform flow.
CO4	Analyze and compute water surface profiles for gradually varied flow in open channels
CO5	Select the most efficient pump(s) for various engineering applications based on pump performance curve

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓							✓	✓	✓	✓	✓
CO2	✓				✓							✓	✓	✓	✓	✓
CO3	✓				✓							✓	✓	✓	✓	✓
CO4	✓				✓							✓	✓	✓	✓	✓
CO5	✓				✓							✓	✓	✓	✓	✓
	✓				✓							✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Classification of Open Channels and their properties.
Topic 2.	Velocity Distribution in a Channel Section.
Topic 3.	Energy And Momentum Principles in Open Channel Flow.
Topic 4.	Energy Principles Applied To Non-Prismatic Channel.
Topic 5.	Steady Uniform Flow Equations.
Topic 6.	Most Efficient Cross Section.
Topic 7.	Hydraulic Jump and its application.
Topic 8.	Non-Uniform Flow In Open Channels.
Topic 9.	Pumping System and Pumps Characteristics Curves.

25	Course Syllabi – ABET Format
352CE-3 : Reinforced Concrete I	352همد-3 : خرسانة مسلحة 1

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	352CE-3
Course Title	Reinforced Concrete I

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Eng. Ahmad Malkawi
Name of coordinator	Eng. Ahmad Malkawi

4. Text book, title, author, and year	
Text Book	Edward G. Nawy, "Reinforced Concrete: A Fundamental Approach", Prentice Hall, Last Edition
other supplemental materials	1. ACI Committee 318, "ACI Standard, Building Code Requirements for Structural Concrete (ACI 318-11) and Commentary", American Concrete Institute, 2011. 2. Jack C. McCormac, Russell H. Brown, Design of reinforced concrete, Wiley, Last Edition. 3. Arthur H. Nilson, David Darwin, Charles W. Dolan, Design ofconcretestructures, McGraw Hill, Last Edition.

5. Specific course information		
Catalog description	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.	
Prerequisites	241CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Define and illustrate reinforced concrete properties, behavior, ACI requirements and design concepts and theories
CO2	Analyze and design various shaped-sections of prismatic members for flexure.
CO3	Analyze and design various shaped-sections of prismatic members for shear.
CO4	Check for serviceability requirements to control deflections and cracking.
CO5	Compute cutoff points, development length, splicing and anchorage of reinforcement.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓		✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓
CO2	✓		✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓
CO3	✓		✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓
CO4	✓		✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓
CO5	✓		✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓
	✓		✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction to concrete and reinforced concrete properties, materials, behavior and types of loads
Topic 2.	Flexural analysis and design of beams
Topic 3.	Shear and diagonal tension in beams
Topic 4.	Bond, Anchorage, and Development Length
Topic 5.	Serviceability

26	Course Syllabi – ABET Format
254MATH-3 : Numerical Analysis	254ريض-3 : الطرق العددية

Program/Department	Civil Engineering Program	Code	MATH

1. Course number and name	
Course Code	254MATH-3
Course Title	Numerical Analysis

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Mohamed Sebak Mohamed Bahg
Name of coordinator	Dr. Mohamed Sebak Mohamed Bahg

4. Text book, title, author, and year	
Text Book	R. L. Burden and J. D. Faires, Numerical Analysis, 8th edition, 2005.
	Numerical Methods for Scientists and Engineers by R W Hamming Courier Dover Publications.

5. Specific course information		
Catalog description	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-Jordon iterative method. Gauss-Jordon 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	204Math-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Estimate approximation and round-off errors.

CO2	Apply curve fitting interpolation methods to engineering problems.
CO3	Apply numerical methods to solve engineering problems.
CO4	Find optimal solutions for symbol constrained and unconstrained problems.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓				✓		✓	✓	✓	✓	✓	✓
CO2	✓				✓				✓		✓	✓	✓	✓	✓	✓
CO3	✓				✓				✓		✓	✓	✓	✓	✓	✓
CO4	✓				✓				✓		✓	✓	✓	✓	✓	✓
	✓				✓				✓		✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Types of errors, errors analysis. Numerical solutions of nonlinear equations of single variables:
Topic 2.	fixed point iteration method, bisection method, false position method, Newton-Raphson method
Topic 3.	Numerical solutions of a system of linear equations: Gauss-Jordon iterative method.
Topic 4.	Gauss-Jordon iterative method with partial and complete pivoting. Interpolation: Lagrange interpolation formula
Topic 5.	Numerical differentiation. Numerical integration
Topic 6.	Numerical integration. Introduction to numerical solutions of ordinary differential equations.

27	Course Syllabi – ABET Format
41CE-3 : Properties and Testing of Materials	**341همد-3 : خواص واختبارات مواد**

Program/Department	**Civil Engineering Program**	**Code**	**CE**

1. Course number and name	
Course Code	CE 342-3
Course Title	Properties and Testing of Materials

2. Credits and contact hours	
Credit Hours	3 (2 , 2 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assist . Prof . Dr. Ahmed Abd El Aal
Name of coordinator	Assist . Prof . Dr. Ahmed Abd El Aal

4. Text book, title, author, and year	
Text Book	Michael S Mamlouk, John Zaniewski, "Materials for Civil and Construction Engineers", Pearson Prentice, Last Edition.
other supplemental materials	A.M. Neville, "Concrete Technology"

5. Specific course information		
Catalog description	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 hummer 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. Nondestructive testing on concrete.	
Prerequisites	241CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify properties, types, testing and test techniques of cement.
CO2	Identify the role of chemical and mineral admixtures in concrete technology.
CO3	Identify the fresh properties of concrete.
CO4	Identify the role of water cement ratio on fresh and hardened properties of concrete.
CO5	Sum up types and mechanical properties of reinforcing steel.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1		✓									✓	✓	✓		✓	✓
CO2		✓									✓	✓	✓		✓	✓
CO3		✓									✓	✓	✓		✓	✓
CO4		✓									✓	✓	✓		✓	✓
CO5		✓									✓	✓	✓		✓	✓
		✓									✓	✓	✓		✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction to civil Engineering materials
Topic 2.	Properties, types, testing and test techniques of cement
Topic 3.	Aggregates, Grading of aggregates and Alkali aggregate reaction
Topic 4.	Specification limits of mixing and curing water and admixtures.
Topic 5.	Fresh properties of concrete
Topic 6.	Hardened properties of concrete

28	Course Syllabi – ABET Format
353CE-3 : Structural Analysis II	353همد-3 : تحليل إنشائي 2

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	353CE-3
Course Title	Structural Analysis II

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assoc. Prof. Dr. Hashem Al-Mattarneh
Name of coordinator	Assoc. Prof. Dr. Hashem Al-Mattarneh

4. Text book, title, author, and year	
Text Book	Structural Analysis, 7th edition, 2009 Person Education South Asia Pte Ltd, by Russell C. Hibbeler
other supplemental materials	Fundamental of Structural Analysis, by H. West and L. Geschwindner, John Wihley& Sons, Inc., 1993

5. Specific course information		
Catalog description	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 considerations and analysis of non-prismatic members.	
Prerequisites	251CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Analyze of Statically Indeterminate Structures by the Force method
CO2	Analyze of continuous beam and frames using slope-deflection method
CO3	Analyze of continuous beam and frame by the moment-distribution method
CO4	Analyze plane truss, beam and frame by the direct stiffness matrix
CO5	Compute reactions and member forces due to non-prismatic sections, support settlement, temperature changes and fabrication errors

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓						✓	✓	✓	✓	✓	✓
CO2	✓				✓						✓	✓	✓	✓	✓	✓
CO3	✓				✓						✓	✓	✓	✓	✓	✓
CO4	✓				✓						✓	✓	✓	✓	✓	✓
CO5	✓				✓						✓	✓	✓	✓	✓	✓
	✓				✓						✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction to indeterminate structures, Define and classify the structure into determinate and indeterminate and determine the kinematic degree of freedom
Topic 2.	Analysis of structures using consistent deformation method (force/flexibility)
Topic 3.	Moment distribution method and sway consideration in analysis of frames
Topic 4.	Slope Deflection Method and sway consideration in analysis of frames
Topic 5.	Stiffness method for beams, trusses and frames
Topic 5.	Pre-strain, temperature change, support movement effects and analysis of non-prismatic members

29	Course Syllabi – ABET Format
306GE-2 : Engineering Economy	306هعم-2 : اقتصاد هندسي

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	306GE-2
Course Title	Engineering Economy

2. Credits and contact hours	
Credit Hours	2(2,0,1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	3 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Mousab Mirghani
Name of coordinator	Dr. Mousab Mirghani

4. Text book, title, author, and year	
Text Book	Engineering economy by W.G.Sullivan, E.M. wicks, and J.T.Luxhoj
other supplemental materials	Basic of Engineering Economy bu Leland Blank Anthony traquim

5. Specific course information		
Catalog description	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.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Calculate the equivalent values of the cost accounting.
CO2	Analyze the time-cost relation and depreciation concept
CO3	Evaluate the financial planning for the projects.
CO4	Analyze the financial position for the projects.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓		✓					✓			✓	✓	✓	✓	✓	✓
CO2	✓		✓					✓	✓			✓	✓	✓	✓	✓
CO3	✓		✓		✓			✓	✓			✓	✓	✓	✓	✓
CO4	✓		✓					✓			✓	✓	✓	✓	✓	✓
	✓		✓		✓			✓	✓		✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction
Topic 2.	Basic concepts of economy
Topic 3.	Cost estimation
Topic 4.	Demand and price relationships
Topic 5.	Interest and inflation
Topic 6.	Cost driven cost optimization
Topic 7.	Cash-flow charts

30	Course Syllabi – ABET Format
313CE -3 : Hydrology	313همد-3 : هيدرولوجيا

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	313CE -3
Course Title	Hydrology

2. Credits and contact hours	
Credit Hours	3 (2 , 2 , 1) Credit Hours (theory , Lab/practical, tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Prof. Dr. Ahmed Helmy
Name of coordinator	Prof. Dr. Ahmed Helmy

4. Text book, title, author, and year	
Text Book	Hydrology for Engineers, Linseley et al.
other supplemental materials	Groundwater Resources, NevenKresic, McGraw-Hill Book Co., 2008.

5. Specific course information		
Catalog description	The hydrologic cycle. Fundamentals of meteorology, temperature, humidity, wind, precipitation, evaporation. Stream-flow and runoff. Stream flow hydrographs. Unit hydrographs for various durations and its applications. Ground water flow and aquifers, Wells Hydraulics. Intrusion in coastal aquifers.	
Prerequisites	312CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Define hydrologic cycle components: rainfall, evaporation and interception and describe how these components are measured in space and time and explain the importance of these measurements.
CO2	Explain the spatial patterns and temporal variability of precipitation and their hydrological relevance and give an example of an analysis of precipitation data.
CO3	Define and explain various methods to determine, and measure evapotranspiration and infiltration losses.
CO4	Analyze runoff data and stream flow hydrographs.
CO5	Identify and formulate the groundwater flow, water quantity from aquifers and wells.
CO6	Analyze salt water intrusion in coastal aquifers.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓	✓							✓	✓		✓	✓	✓	✓	✓
CO2	✓											✓	✓	✓	✓	✓
CO3	✓	✓	✓								✓	✓	✓	✓	✓	✓
CO4	✓										✓	✓	✓	✓	✓	✓
CO5	✓	✓		✓	✓			✓			✓	✓	✓	✓	✓	✓
CO6	✓				✓			✓			✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	The hydrologic cycle.
Topic 2.	Fundamentals of meteorology: Temperature, humidity, wind, precipitation, and evaporation.
Topic 3.	Stream flow and runoff.
Topic 4.	Stream flow hydrograph and Unit hydrograph.
Topic 5.	Groundwater flow.
Topic 6.	Types of aquifer sand hydraulics of wells.
Topic 7.	Salt water intrusion in coastal aquifers.

31	Course Syllabi – ABET Format
371CE-3: Sanitary Engineering	371همد-3 : هندسة صحية

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	371CE-3
Course Title	Sanitary Engineering

2. Credits and contact hours	
Credit Hours	3 (2 , 2 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Prof. Dr. Ahmed Helmy
Name of coordinator	Prof. Dr. Ahmed Helmy

4. Text book, title, author, and year	
Text Book	Husain, S.K. (2006).Textbook Of Water Supply And Sanitary Engineering, Publisher Oxford & Ibh, 3rd Edition.
other supplemental materials	K. S. Rangwala and P. S. Rangwala. 2009. Water supply and sanitary engineering. 23^{ed} Edition.

5. Specific course information		
Catalog description	Source of water supply. Quantity of water and wastewater. Quality of water supply. Drinking water standard. Water treatment system: Sedimentation, Coagulation-flocculation; Filtration; Disinfection; Softening; Iron and manganese removal; Taste and odor removal. Collection and distribution of water. Characteristics of wastewater & effluent standard. Wastewater collection. Wastewater treatment processes.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Explain the role of sanitation, sources, and quantity of water supply in the urban water cycle.
CO2	Evaluate quality of water supply and drinking water standards and its relation to public health and environment.
CO3	Design mechanical and chemical treatment processes for household, industrial, and commercial uses of water.
CO4	Analyze, design, and establish collection systems for water supply and distribution pipe networks within the logistic, economic and legal frame.
CO5	Investigate wastewater characteristics; effluent standards; and treatment technology, and collection & design of sewer system.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓							✓	✓			✓	✓	✓	✓	✓
CO2	✓	✓						✓				✓	✓	✓	✓	✓
CO3	✓	✓	✓		✓			✓			✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓						✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓		✓			✓			✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Source of water supply.
Topic 2.	Quantity of water and wastewater drinking water standards..
Topic 3.	Collection and Distribution of water.
Topic 4.	Water treatment system: Sedimentation; and Coagulation-flocculation.
Topic 5.	Water treatment system: Filtration.
Topic 6.	Water treatment system: Disinfections & Softening &Iron and manganese removal.
Topic 7.	Characteristics of waste water, and effluent standard.
Topic 8.	Wastewater collection& treatment processes.

32	Course Syllabi – ABET Format
354CE-3 : Reinforced Concrete II	354همد-3 : خرسانة مسلحة 2

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	354CE-3
Course Title	Reinforced Concrete II

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assoc. Prof. Dr. Hashem Al-Mattarneh
Name of coordinator	Assoc. Prof. Dr. Hashem Al-Mattarneh

4. Text book, title, author, and year	
Text Book	Arthur H. Nilson, David Darwin and Charles W. Dolan, Design of Concrete Structures, 14th Edition, SI Units, Mcgraw-Hill, 2010. ACI-381, 2011 Concrete design code or any ACI code from year 2002 and above Saudi Arabia Code
other supplemental materials	1. Edward G. Nawy, "Reinforced Concrete: A Fundamental Approach", Prentice Hall, Last Edition. 2. James MacGregor, James K. Wight, "Reinforced Concrete: Mechanics and Design", Prentice Hall, Last Edition.

5. Specific course information		
Catalog description	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.	
Prerequisites	351CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Analyze continuous beam and frame structures and Compute ACI code coefficients and build moment and shear envelope
CO2	Analyze and design reinforced concrete slabs
CO3	Analyze and design reinforced concrete beam subjected to shear and torsion
CO4	Analyze and design reinforced concrete column
CO5	Analyze and design reinforced concrete footing

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓		✓								✓	✓	✓	✓	✓	✓
CO2	✓		✓								✓	✓	✓	✓	✓	✓
CO3	✓		✓								✓	✓	✓	✓	✓	✓
CO4	✓		✓								✓	✓	✓	✓	✓	✓
CO5	✓		✓								✓	✓	✓	✓	✓	✓
	✓		✓								✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Analysis of continuous beams and frames and use of ACI code coefficients.
Topic 2.	ACI moment redistribution for minimum rotation capacity.
Topic 3.	Design of one-way, two-way, ribbed and flat slabs floor systems.
Topic 4.	Design for “torsion” and “combined shear and torsion” by the strength method.
Topic 5.	Design of columns under axial and eccentric loadings, short and long columns
Topic 6.	Design of staircases, and types of concrete footings.

33	Course Syllabi – ABET Format
322CE-3 : Soil Mechanics II	322همد-3 : ميكانيكا التربة 2

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	322CE-3
Course Title	Soil Mechanics II

2. Credits and contact hours	
Credit Hours	3 (2 , 2 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Associate Professor Ammar Rouaiguia
Name of coordinator	Associate Professor Ammar Rouaiguia

4. Text book, title, author, and year	
Text Book	A Aysen . 2006. Soil Mechanics: Basic Concepts and Engineering Applications. Publisher: Taylor & Francis Group.
other supplemental materials	C. Venkatramaiah, "Geotechnical Engineering", New Age International (P) Ltd., Publishers (2006).

5. Specific course information		
Catalog description	Principle of Effective Stress, Permeability and capillarity of soils, seepage and Flow's nets, Stress distribution of soils, Compressibility and settlement, Consolidation Behavior, Shearing strength of soils. Lateral earth pressure and Retaining walls.	
Prerequisites	221CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Analysis of Stress distribution and Apply Principle of Effective Stress.
CO2	Compute Compressibility and settlement.
CO3	Analysis of Consolidation Behavior and Shear strength of soils.
CO4	Apply principles of Permeability, Seepage and Flow's nets of soils.
CO5	Analysis of Lateral earth pressure and Retaining walls.
CO6	Conduct experiment, analyze and interpret data.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓						✓	✓	✓	✓	✓	✓
CO2	✓				✓						✓	✓	✓	✓	✓	✓
CO3	✓				✓						✓	✓	✓	✓	✓	✓
CO4	✓	✓			✓						✓	✓	✓	✓	✓	✓
CO5	✓	✓			✓						✓	✓	✓	✓	✓	✓
	✓	✓			✓						✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Analysis of Stress distribution of soils.
Topic 2.	Apply Principle of Effective Stress.
Topic 3.	Analysis of Consolidation Behavior
Topic 4.	Shear strength of soils.
Topic 5.	Apply principles of Permeability, Seepage and Flow's nets of soils.
Topic 6.	Analysis of Lateral earth pressure and Retaining walls.

34	Course Syllabi – ABET Format
355CE-3 : Steel Structures	355همد-3 : منشآت معدنية

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	355CE-3
Course Title	Steel Structures

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assistant. Prof. Dr. Ahmad Salah Edeen Nassef
Name of coordinator	Assistant. Prof. Dr. Ahmad Salah Edeen Nassef

4. Text book, title, author, and year	
Text Book	Charles G. Salmon, John E. Johnson, Faris Malhas, "Steel Structures: Design and Behavior" Prentic Hall, 5th edition.
other supplemental materials	1. Jack McCormac, Stephen F. Casernac, "Structural Steel Design" Prentic Hall, Last edition. 2. Manual of Steel Construction by AISC ISBN 1-56424-041-X , ISBN 1-56424-042-8

5. Specific course information		
Catalog description	Analysis and design of roof trusses. Design of tension and compression members, column 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 line.	
Prerequisites	353 CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Design steel tension member.
CO2	Design steel compression member.
CO3	Design steel beam.
CO4	Design steel beam column.
CO5	Design steel connections.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓		✓		✓	✓		✓	✓		✓	✓	✓	✓	✓	✓
CO2	✓		✓		✓	✓		✓	✓		✓	✓	✓	✓	✓	✓
CO3	✓		✓		✓	✓		✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓		✓		✓	✓		✓	✓		✓	✓	✓	✓	✓	✓
CO5	✓		✓		✓	✓		✓	✓		✓	✓	✓	✓	✓	✓
	✓		✓		✓	✓		✓	✓		✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction to structures steel design
Topic 2.	Design of tension member.
Topic 3.	Design of compression member.
Topic 4.	Design of beam.
Topic 5.	Design of beam column (eccentric normal force).
Topic 6.	Design of bolted connections.
Topic 7.	Design of welded connections.

35	Course Syllabi – ABET Format
381CE-2 : Computer Applications in Civil Engineering	**381همد-2 : تطبيقات الحاسب في الهندسة المدنية**

Program/Department	**Civil Engineering Program**	**Code**	**CE**

1. Course number and name	
Course Code	381CE-2
Course Title	Computer Applications in Civil Engineering

2. Credits and contact hours	
Credit Hours	2 (1 , 2 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Ahmad Mustafa Maglad
Name of coordinator	Dr. Ahmad Mustafa Maglad

4. Text book, title, author, and year	
Text Book	Lectures notes
other supplemental materials	1. SAP2000 v.14 manual. 2. AUTOCAD 2012 manual.

5. Specific course information		
Catalog description	Study different applications in civil engineering through the use of computer. Emphasis will be placed on available computer software used in engineering projects and industry in civil engineering disciplines.	
Prerequisites	204GE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Analyze different structures using SAP2000 V. 14.
CO2	Model structures using SAP2000 V. 14.
CO3	Draw using AUTOCAD 2012.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1					✓	✓	✓				✓	✓	✓	✓	✓	✓
CO2					✓	✓	✓				✓	✓	✓	✓	✓	✓
CO3					✓	✓	✓				✓	✓	✓	✓	✓	✓
					✓	✓	✓				✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction to structural systems.
Topic 2.	Analysis of Beams Using SAP2000 v.14
Topic 3.	Analysis of 2-D Frames Using SAP2000 v.14
Topic 4.	Analysis of Trusses Using SAP2000 v.14
Topic 5.	Analysis of Slabs Using SAP2000 v.14
Topic 6.	Analysis of 3-D Structures Using SAP2000 v.14
Topic 7.	Modeling Using SAP2000 v.14
Topic 8.	Drawing Using AUTOCAD 2012.

36	Course Syllabi – ABET Format
462CE-3 : Surveying II	462همد-3 : مساحه 2

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	462CE-3
Course Title	Surveying II

2. Credits and contact hours	
Credit Hours	3 (2 , 2 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Ass. Prof. Dr. Ismail Elkhrachy
Name of coordinator	Ass. Prof. Dr. Ismail Elkhrachy

4. Text book, title, author, and year	
Text Book	Michael Kennedy, " The Global Positioning System and GIS: An Introduction", T & F Books UK (2007). Edward M. Mikhail, James S. Bethel, and J. Chris McGlone," Introduction to Modern Photogrammetry", Publisher: Wiley, last version.
other supplemental materials	Not Specified

5. Specific course information		
Catalog description	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.	
Prerequisites	261CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Using total station equipment to calculate and setout point coordinates.
CO2	Calculate geodetic principals, coordinate Systems transformation, map projection and UTM.
CO3	Using global positioning system (GPS) to calculate and setout point coordinates..
CO4	Calculate photogrammetry and remote sensing unknowns.
CO5	Applying GIS system, software, and GIS applications.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓			✓	✓						✓	✓	✓	✓	✓	✓
CO2	✓			✓	✓						✓	✓	✓	✓	✓	✓
CO3	✓			✓	✓						✓	✓	✓	✓	✓	✓
CO4	✓			✓	✓						✓	✓	✓	✓	✓	✓
CO5	✓			✓	✓						✓	✓	✓	✓	✓	✓
	✓			✓	✓						✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Adjust and use of total station to collect coordinates.
Topic 2.	Adjust and use of GPS to collect coordinates.
Topic 3.	Mapping production using total station and GPS.
Topic 4.	Integration photogrammetry and GPS and GIS by using software ArcMap 10.1, Erdas imagin 2011.

37	Course Syllabi – ABET Format
431CE-3: Highway Engineering	431همد-3 : هندسة الطرق

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	431CE-3
Course Title	Highway Engineering

2. Credits and contact hours	
Credit Hours	3 (2 , 2 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	5 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assist. Prof. Dr. Gamil M.S. Abdullah
Name of coordinator	Assist. Prof. Dr. Gamil M.S. Abdullah

4. Text book, title, author, and year	
Text Book	Fred L. Mannering, Walter P. Kilareski, Scott S. Washburn, "Principles of Highway Engineering and Traffic Analysis", John Wiley, Last Edition, 2009.
other supplemental materials	1. Nicholas J. Garber, Lester A. Hoel, "Traffic and Highway Engineering", Brooks/Cole, Last Edition. 2. Martin Roger, "Highway Engineering", by Blackwell Publishing Ltd., 2003.

5. Specific course information		
Catalog description	Highway planning and capacity: design criteria and controls, cross sectional elements, sight distances, horizontal and vertical alignments, intersections, sub-surface drainage. Components of Traffic system. Traffic-stream characteristics. Traffic studies, traffic safety. Capacity of urban streets and intersections. Congestion management. The Design of Highway Intersections, Geometric Alignment and Design, Highway Pavement Materials and Design, Structural Design of Pavement Thickness, Pavement Maintenance.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify types and classification of highways and their cross sectional elements of highways.
CO2	Design the proper geometric elements of highways (sight distances, horizontal and vertical alignments and intersections).
CO3	Design surface and sub-surface drainage structures.
CO4	Define and find traffic-stream characteristics, safety, capacity of urban streets and intersections.
CO5	Design pavement structures and define pavement materials.
CO6	Define pavement distress and know how to maintain and repair the pavement structures.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓		✓									✓	✓	✓	✓	✓
CO2	✓		✓								✓	✓	✓	✓	✓	✓
CO3	✓											✓	✓	✓	✓	✓
CO4	✓										✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓									✓	✓	✓	✓	✓
CO6	✓				✓						✓	✓	✓	✓	✓	✓
	✓	✓			✓						✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Highway planning and capacity (design criteria and controls, cross sectional elements)
Topic 2.	Geometric alignment and design (sight distances, horizontal and vertical alignments, intersections)
Topic 3.	Sub-surface drainage
Topic 4.	Traffic-stream characteristics, traffic studies and safety, capacity of urban streets and intersections. congestion management
Topic 5.	Highway pavement materials and structural design of pavement thickness
Topic 6.	Pavement Maintenance.

38	Course Syllabi – ABET Format
423CE-3: Foundation Engineering	423همد-3 : هندسة الاساسات

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	423CE-3
Course Title	Foundation Engineering

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assistant Professor Abdullah A. Al-Homidy
Name of coordinator	Assistant Professor Abdullah A. Al-Homidy

4. Text book, title, author, and year	
Text Book	Braja M. Das, "Principles of Foundation Engineering", CL-Engineering, 6th edition, 2006.
other supplemental materials	Robert W. day (2006). " Foundation Engineering Handbook" McGraw Hill Companies, Inc.

5. Specific course information		
Catalog description	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.	
Prerequisites	322CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Define and classify the soil profile and soil type at the site.
CO2	Design different shallow foundations.
CO3	Design Mat Foundations.
CO4	Compute Foundation Settlement.
CO5	Design deep Foundations (piles) and Sheet Piles.
CO6	Analyses Slope Stability of soil.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓											✓	✓	✓	✓	✓
CO2	✓		✓					✓				✓	✓	✓	✓	✓
CO3	✓		✓					✓				✓	✓	✓	✓	✓
CO4	✓		✓									✓	✓	✓	✓	✓
CO5	✓										✓	✓	✓	✓	✓	✓
CO6	✓							✓			✓	✓	✓	✓	✓	✓
	✓		✓					✓			✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Site Exploration
Topic 2.	Types of Foundations and Bearing Capacity of Shallow Foundations
Topic 3.	Mat Foundations
Topic 4.	Settlement Analyses of Foundations
Topic 5.	Deep Foundations and Sheet Piles
Topic 6.	Slopes Stability Analyses of Soil.

39	Course Syllabi – ABET Format
113ISL-2 :Islamic Culture (3)	113سلم-2 : ثقافة إسلامية 3

Program/Department	Civil Engineering Program	Code	ISL

1. Course number and name	
Course Code	113ISL-2
Course Title	Islamic Culture (3)

2. Credits and contact hours	
Credit Hours	2 (2 , 0 , 0) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	2 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Saleh Salem Alharthy
Name of coordinator	Dr. Saleh Salem Alharthy

4. Text book, title, author, and year	
Text Book	المدخل لدراسة علوم القرآن، د .محمد أبو شهبة. أصول الحديث، د .محمد عجاج الخطيب. تفسير السعدي. تفسير ابن كثير. الكتب الستة وشروحها. مذكرة في أصول الفقه، للشنقيطي.
other supplemental materials	

5. Specific course information		
Catalog description	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.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Consolidate the true Islamic believes of the students based on scientific basis and methodologies.
CO2	Define the concept of ethics in Islam.
CO3	Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples.

CO4	Demonstrate the Islamic solutions for daily life problems.
CO5	Explain the effect of applying the Islamic ethics and values on community.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1																
CO2																
CO3																
CO4																
CO5																

7. Brief list of topics to be covered	
Topic 1.	أولاً :القرآن الكريم: بيان معنى القرآن وإنه كلام الله حقيقة منزلة غير مخلوق. نزوله الغرض من إنزاله حكمة نزوله منجماً جمعه وتدوينه ثبوت نصه علمياً– – – – . فكرة عامة عن القراءات العشر مع المراد من قول الرسول(أنزل القرآن على سبعة أحرف.) دفع شبهات أعداء الإسلام حول القرآن (كالتشكيك بحدوث الوحي، والتشكيك بصحة بعض القراءات الثابتة وغير ذلك.) - مضمونه وما اشتمل عليه من موضوعات. - قيمته ومكانته باعتباره المصدر الأول للإسلام.
Topic 2.	ثانياً :دراسة متأنية عميقة لسورة أو أكثر من القرآن وذلك بشكل يشد الطلاب إلى كتاب الله، ويحببهم فيه، ويبرز لهم روائعه الفكرية والعلمية ومضامينه التوجيهية والإصلاحية للأفراد والمجتمعات، وهدايته المثلى إلى سعادة الدنيا وسعادة الآخرة، مع العناية ببيان الوحدة الموضوعية للسورة، للمدرس أن يختار من سور القرآن إحدى السور التالية أو ما يعادلها مما يراه محققاً للهدف (:النور، التوبة، آل عمران، الأنعام، الرعد)ويكون من تفسير (تيسير الكريم الرحمن في تفسير كلام المنان) للشيخ عبد الرحمن السعدي رحمه الله تعالى أو مختصر تفسير ابن كثير للشيخ نسيب الرفاعي. ثالثاً :السنة: ما تشتمل عليه من أقوال الرسول وأفعاله (سيرته) وتقاريره (حياة الصحابة معه) معاني الحديث والخبر والأثر– والحديث القدسي. منهج المسلمين الدقيق في تحقيق الحديث وتحري صحته ونفي الدخيل عنه، تدوين الحديث مع التركيز على دفع شبهات أعداء الإسلام حول ذلك.
Topic 3	رابعاً :الإجماع: تعريفه، حجيته، أدلته، فكرة عامة موجزة عنه، كون القرآن والسنة هما الأساس له في الحقيقة.
Topic 4	خامساً :الاجتهاد: تعريفه، شروطه، من هم أهل الاجتهاد ؟
Topic 5	سادساً :دراسة لطائفة من أحاديث الرسول ينتقيها المدرس من صحاح الأحاديث التي تشتمل على أمهات أصول الإسلام مع تجديد الانتقاء من سنة لأخرى، ويحسن أن يراعي في انتقاءها أن تكون مشتملة على جوانب العقيدة والتربية ونماذج من تشريعا لإسلام الاقتصادي والسياسي والاجتماعي والأخلاقي والدعوة إلى نشر الإسلام والجهاد في سبيل الله.

40	Course Syllabi – ABET Format
407GE-2 : Management of Engineering Projects	407هعم – 2: إدارة المشاريع الهندسية

Program/Department	Civil Engineering Program	Code	GE

1. Course number and name	
Course Code	407GE-2
Course Title	Management of Engineering Projects

2. Credits and contact hours	
Credit Hours	2(2,0,1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	2 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Mousab Mirghani
Name of coordinator	Dr. Mousab Mirghani

4. Text book, title, author, and year	
Text Book	Daniel W. Halpin ,"Construction Management", John Wiley & Sons, New York (2006).
other supplemental materials	

5. Specific course information		
Catalog description	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	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Planning of the construction projects.
CO2	Manage the feasibility studies
CO3	Manage the construction contracting
CO4	Control the construction costing process.
CO5	Planning of safety precautions
CO6	Manage the quality control process for the construction projects

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓		✓					✓				✓	✓	✓	✓	✓
CO2	✓		✓					✓	✓			✓	✓	✓	✓	✓
CO3	✓		✓		✓			✓	✓			✓	✓	✓	✓	✓
CO4	✓		✓					✓				✓	✓	✓	✓	✓
CO5			✓			✓						✓	✓	✓	✓	✓
CO6			✓									✓	✓	✓	✓	✓
	✓		✓		✓	✓		✓	✓			✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction
Topic 2.	Definition of organizations and projects
Topic 3.	Time planning of projects
Topic 4.	Feasibility studies
Topic 5.	Charts representation of projects plans
Topic 6.	Quality assurance

41	Course Syllabi – ABET Format
202ARAB -2: Arabic Language	202عرب –2: التحرير العربي

Program/Department	Civil Engineering Program	Code	ARAB

1. Course number and name	
Course Code	202ARAB -2
Course Title	Arabic Language

2. Credits and contact hours	
Credit Hours	2 (2 , 0 , 0) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	2 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Mohammed asiri
Name of coordinator	Mohammed asiri

4. Text book, title, author, and year in arabic	
Text Book	شرح قطر الندى وبل الصدى لابن هشام
other supplemental materials	شذا العرف في فن الصرف للحملاوي

5. Specific course information in Arabic		
Catalog description	تعريف الكلمة : لغة واصطلاحاً .أقسام الكلمة : اسم، وفعل، وحرف. علامات الاسم : (ال) 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 ائتلاف 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 المثنى وما ألحق به جمع المذكر السالم وما ألحق به الجمع بالألف والتاء المزيدتين 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.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	1. Apply essential Arabic grammar necessary for daily life communications.

CO2	2. Enhance the expression's style using examples of the Holy Qur'an, Hadeeth (sayings and actions) of Prophet Muhammad (PBUH), and famous poems.
CO3	3. Enhance the student's communication skills in their mother tongue.
CO4	4. Recognize the importance of Arabic language as the language of Islamic civilization.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1																
CO2																
CO3																
CO4																

7. Brief list of topics to be covered	
Topic 1.	تعريف الكلمة : لغة واصطلاحاً .أقسام الكلمة : اسم، وفعل، وحرف. علامات الاسم(: أل)التعريف، التنوين، والحديث عنه. من الحديث الشريف : خطبة الوداع، أو بعض الأحاديث المختارة ذات التوجيه الاجتماعي والسلوكي. من الشعر والنثر : مختارات شعرية ونثرية تمثل الأدب العربي.
Topic 2.	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.
Topic 3.	صور ائتلاف الكلام ست .تعريف الإعراب، وبيان أنواعه، مع بيان ما يشترك فيه الاسم والفعل، وما يختص به كل واحد منهما، وبيان العلامات الأصول والفروع
Topic 4.	مما خرج عن الأصل في إعرابه سبعة أبواب: خمسة في الأسماء - الأسماء الستة- المثنى وما ألحق به- جمع المذكر السالم وما ألحق به الجمع بالألف والتاء المزيدتين وما ألحق به في حالة النصب - الممنوع من الصرف في حالة الجر. واثنان في الأفعال: الأفعال الخمسة
Topic 5.	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 .

42	Course Syllabi – ABET Format
491CE -2 : Graduation Project I	491همد –2: مشروع التخرج 1

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	491CE -2
Course Title	Graduation Project (1)

2. Credits and contact hours	
Credit Hours	2(2,0,1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	3 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Mohamad Dahim
Name of coordinator	Dr. Mohamad Dahim

4. Text book, title, author, and year	
Text Book	To be specified by instructor, based on literate review.
other supplemental materials	To be specified by instructor, based on literate review.

5. Specific course information		
Catalog description	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.	
Prerequisites	Complete 90 credit hours	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify, formulate and solve the analytical and numerical problems associated with the project
CO2	Design a system, component or process with defined constraints of the project
CO3	Plan, design and conduct the laboratory or numerical experiments required for the project and to analyze and interpret the data
CO4	Describe the economic and environmental impact and contemporary issues of the project2 and various alternative solutions
CO5	Function as a member of a multi-disciplinary team
CO6	Idetify the codes and local laws regulating various aspects of the project and apply the codes wherever possible
CO7	Identify and analyze a situation involving professional ethics and to make a decision
CO8	Prepare an engineering report of the project and present it demonstrating engineering communication skills
CO9	Collect data and information required to complete the project from Library and Internet resources

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓						✓	✓	✓	✓	✓	✓
CO2			✓			✓					✓	✓	✓	✓	✓	✓
CO3		✓									✓	✓	✓	✓	✓	✓
CO4								✓		✓		✓	✓	✓	✓	✓
CO5				✓								✓	✓	✓	✓	✓
CO6						✓						✓	✓	✓	✓	✓
CO7						✓						✓	✓	✓	✓	✓
CO8							✓				✓	✓	✓	✓	✓	✓
CO9									✓		✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Choosing the topic, establishing the project
Topic 2.	literature review
Topic 3.	preparing for/or preliminary conducting the experiments
Topic 4.	collecting the field data & developing the mathematical / computer model if applicable
Topic 5.	writing the first part of the project along with any preliminary findings.

43	Course Syllabi – ABET Format
114ISL-2 :Islamic Culture (4)	114سلم –2: ثقافة إسلامية 4

Program/Department	Civil Engineering Program	Code	ISL

1. Course number and name	
Course Code	114ISL-2
Course Title	Islamic Culture (4)

2. Credits and contact hours	
Credit Hours	2 (2 , 0 , 0) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	2 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Saleh Salem Alharthy
Name of coordinator	Dr. Saleh Salem Alharthy

4. Text book, title, author, and year	
Text Book	دعوة الشيخ محمد بن عبد الوهاب وأثرها في العالم الإسلامي، د .صالح العبود.
other supplemental materials	

5. Specific course information		
Catalog description	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.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Consolidate the true Islamic believes of the students based on scientific basis and methodologies.
CO2	Define the concept of ethics in Islam.
CO3	Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples.
CO4	Demonstrate the Islamic solutions for daily life problems.
CO5	Explain the effect of applying the Islamic ethics and values on community.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1																
CO2																
CO3																
CO4																
CO5																

7. Brief list of topics to be covered	
Topic 1.	أولاً :القرآن الكريم: بيان معنى القرآن وإنه كلام الله حقيقة منزلة غير مخلوق. نزوله الغرض من إنزاله حكمة نزوله منجماً جمعه وتدوينه ثبوت نصه علمياً– – – – . فكرة عامة عن القراءات العشر مع المراد من قول الرسول(أنزل القرآن على سبعة أحرف.) دفع شبهات أعداء الإسلام حول القرآن (كالتشكيك بحدوث الوحي، والتشكيك بصحة بعض القراءات الثابتة وغير ذلك.) - مضمونه وما اشتمل عليه من موضوعات. - قيمته ومكانته باعتباره المصدر الأول للإسلام.
Topic 2.	ثانياً :دراسة متأنية عميقة لسورة أو أكثر من القرآن وذلك بشكل يشد الطلاب إلى كتاب الله، ويحببهم فيه، ويبرز لهم روائعه الفكرية والعلمية ومضامينه التوجيهية والإصلاحية للأفراد والمجتمعات، وهدايته المثلى إلى سعادة الدنيا وسعادة الآخرة، مع العناية ببيان الوحدة الموضوعية للسورة، للمدرس أن يختار من سور القرآن إحدى السور التالية أو ما يعادلها مما يراه محققاً للهدف (:النور، التوبة، آل عمران، الأنعام، الرعد)ويكون من تفسير (تيسير الكريم الرحمن في تفسير كلام المنان) للشيخ عبد الرحمن السعدي رحمه الله تعالى أو مختصر تفسير ابن كثير للشيخ نسيب الرفاعي.
Topic 3.	ثالث اً :السنة: ما تشتمل عليه من أقوال الرسول□ □ وأفعاله (سيرته) وتقريراته (حياة الصحابة معه) معاني الحديث والخبر والأثر– والحديث القدسي. منهج المسلمين الدقيق في تحقيق الحديث وتحري صحته ونفي الدخيل عنه، تدوين الحديث مع التركيز على دفع شبهات أعداء الإسلام حول ذلك.
Topic 4.	رابعاً :الإجماع: تعريفه، حجيته، أدلته، فكرة عامة موجزة عنه، كون القرآن والسنة هما الأساس له في الحقيقة.
Topic 5.	خامساً :الاجتهاد: تعريفه، شروطه، من هم أهل الاجتهاد ؟
Topic 6.	سادساً :دراسة لطائفة من أحاديث الرسول ينتقيها المدرس من صحاح الأحاديث التي تشتمل على أمهات أصول الإسلام مع تجديد الانتقاء من سنة لأخرى، ويحسن أن يراعي في انتقاءها أن تكون مشتملة على جوانب العقيدة والتربية ونماذج من تشريعا لإسلام الاقتصادي والسياسي والاجتماعي والأخلاقي والدعوة إلى نشر الإسلام والجهاد في سبيل الله.

44	Course Syllabi – ABET Format
414 CE-3: Water Resources Planning and Management	414همد –3: تخطيط وإدارة الموارد المائية

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	414 CE-3
Course Title	Water Resource Planning and Management

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assoc. Prof. Dr. Abdelatif Mokhtar Ahmed
Name of coordinator	Assoc. Prof. Dr. Abdelatif Mokhtar Ahmed

4. Text book, title, author, and year	
Text Book	Water Resources Planning, David Tberiaque, (1996). Roman & Little Field.
other supplemental materials	1. Water Resources Engineering, Mays, Larry W., John Wiley and Sons, 2001. 2. Water Resources Engineering, Chin, David A., Pearson Prentice Hall, 2006.

5. Specific course information		
Catalog description	Understand the fundamentals of hydrology e.g., precipitation, evaporation, surface runoff. Understand the planning and management process for water resources. Developing goals and objectives, identification of alternative solutions and analysis of alternatives. Study legal and regulatory issues eg., water rights. Understand economic feasibility i.e., benefit-cost analysis of water projects. Evaluate the water supply and demand projects. Study and understand the water quality management ie, pollution of ground and surface water such as groundwater pollution and surface water pollution, which include rivers, streams and lakes.	
Prerequisites	313CE -3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Define and identify water planning and management, and define the planning .
CO2	Identify legal and regulatory issues i.e., water rights.
CO3	Define economic feasibility i.e., benefit- cost analysis of water projects.
CO4	Evaluate water supply and demand projects.
CO5	Identify the water quality management.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓			✓		✓	✓	✓	✓	✓	✓	✓
CO2								✓				✓	✓	✓	✓	✓
CO3	✓			✓	✓			✓		✓		✓	✓	✓	✓	✓
CO4	✓			✓			✓	✓				✓	✓	✓	✓	✓
CO5	✓	✓						✓			✓	✓	✓	✓	✓	✓
	✓	✓		✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Define the water planning and management process, which include analysis of alternatives, development of implementation program and evaluation of recommendation .
Topic 2.	Define the legal regularity issues and water rights in the USA and the world.
Topic 3.	Identify economic feasibility i.e.; benefit- cost analysis of water projects.
Topic 4.	Evaluate water supply and demand, and identify water projects.
Topic 5.	Define the water quality management ie, water pollution and their sources and to know the total maximum daily load (TMDL) for surface and groundwater.

45	Course Syllabi – ABET Format
432CE-3: Transportation &Traffic Engineering	432همد –3: هندسة النقل والمرور

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	432CE-3
Course Title	Transportation &Traffic Engineering

2. Credits and contact hours	
Credit Hours	3 (3 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assoc. Prof. Dr. Ashraf AlyElkoushy
Name of coordinator	Assoc. Prof. Dr. Ashraf AlyElkoushy

4. Text book, title, author, and year	
Text Book	1. "Transportation engineering- An Introduction", C.JotinKhisty and kentLall, 3rd edition, Prentice hall, 2003. 2. "Traffic Engineering", William R. Mcshane, Roger P. Ross and Elena S. Prassas, 3rd edition, 2004.
other supplemental materials	

5. Specific course information		
Catalog description	Transportation system; 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.	
Prerequisites	431CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Identify basic concepts and stream components of traffic.
CO2	Analyze traffic accidents data.
CO3	Choose appropriate traffic control device.
CO4	Design intersections signalization.
CO5	Apply modern techniques for traffic management.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1					✓							✓	✓	✓	✓	✓
CO2	✓				✓						✓	✓	✓	✓	✓	✓
CO3					✓						✓	✓	✓	✓	✓	✓
CO4	✓				✓						✓	✓	✓	✓	✓	✓
CO5			✓								✓	✓	✓	✓	✓	✓
	✓		✓		✓						✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Basics concepts of Transportation System.
Topic 2.	Traffic stream components.
Topic 3.	Analyze of traffic flow data.
Topic 4.	Urban transport planning.
Topic 5.	Traffic control devices.
Topic 6.	Intersection signalization.

46	Course Syllabi – ABET Format
472CE-3 : Environmental Engineering	472همد –3: هندسة البيئة

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	472CE-3
Course Title	Environmental Engineering

2. Credits and contact hours	
Credit Hours	3 (2 , 2 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	4 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Assoc. Prof. Dr. Abdelatif Mokhtar Ahmed
Name of coordinator	Assoc. Prof. Dr. Abdelatif Mokhtar Ahmed

4. Text book, title, author, and year	
Text Book	"Introduction to Environmental Engineering", McGraw Hill International Edition, by Mackenzie L. Davis and David A. Cornwell, 4th edition, 2008.
other supplemental materials	

5. Specific course information		
Catalog description	Define the mass-balance equation and energy balance. Study the hydrologic cycle, runoff, precipitation, evaporation etc., and study of different aquifers. Listing categories of water quality and its use for different purposes. Listing for measure used to report air pollution and determination of atmospheric stability. Define the sound noise, sound frequency, and sound pressure level, and estimate the noise level. State average mass of solid waste, estimate area required for a landfill and management of hazardous wastes.	
Prerequisites	371CE-3	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Define the mass-balance equation, write and solve energy-balance equations.
CO2	Define and calculate quantities of a given substance in water in percent by weight.
CO3	Define units of measure used to report air pollution data.
CO4	Define sound and noise pollution and frequency.
CO5	Evaluate average mass of solid waste and construct a MSW landfill.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓					✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓						✓			✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓			✓	✓				✓		✓	✓	✓	✓	✓
CO5	✓					✓		✓		✓		✓	✓	✓	✓	✓
	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Define mass-balance equation and energy equation.
Topic 2.	Define water quality and calculate quantities and determine its suitability for different purposes.
Topic 3.	Define air pollution, calculate atmospheric stability and determine acute health effects.
Topic 4.	Define noise and sound pollution and determination of sound frequency
Topic 5.	Evaluate solid waste mass and construct landfill siting, and evaluate environmental hazards. Study and manage hazardous wastes.
Topic 6.	Define mass-balance equation and energy equation.

47	Course Syllabi – ABET Format
433CE-2 : Construction Equipment and Methods	433همد –2: أساليب ومعدات تشييد

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	433CE-2
Course Title	Construction Equipment and Methods

2. Credits and contact hours	
Credit Hours	2 (2 , 0 , 1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	3 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Ass. Prof. Dr. Ismail Elkhrachy
Name of coordinator	Ass. Prof. Dr. Ismail Elkhrachy

4. Text book, title, author, and year	
Text Book	Richard C. Ryan, CalinPopescu, "Construction Equipment Management for Engineers, Estimators and Owners", CRC Press, Last Edition.
other supplemental materials	1. Robert L. Purifoy, Clifford J. Schexnayder, AviadShapira "Construction Planning, Equipment, and Methods" McGraw Hill Last Edition. 2. Jimme W. Hinze, "Planning and Scheduling", Prentic Hall, Last Edition.

5. Specific course information		
Catalog description	Over view of construction industry. Earth moving machinery and operations: excavation and lifting, loading and hauling, compacting and finishing, productivity estimation. Reinforced concrete construction and concrete form design. Construction economic.	
Prerequisites	None	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
a. specific outcomes of instruction (student should be able to:)	
CO1	Calculate the working cost of construction equipment.
CO2	Choose between construction alternatives of same and different lives.
CO3	Calculate the quantities of excavation and refill operations.
CO4	Calculate the cost of concrete forms.
CO5	Compute rates of some construction operations.
CO6	Design site layout.
CO7	Design construction operations network.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓		✓		✓	✓	✓		✓		✓	✓	✓	✓	✓	✓
CO2	✓		✓		✓	✓	✓		✓		✓	✓	✓	✓	✓	✓
CO3	✓				✓	✓	✓		✓		✓	✓	✓	✓	✓	✓
CO4	✓		✓		✓	✓	✓		✓		✓	✓	✓	✓	✓	✓
CO5	✓				✓	✓	✓		✓		✓	✓	✓	✓	✓	✓
CO6					✓	✓	✓		✓		✓	✓	✓	✓	✓	✓
CO7					✓	✓	✓		✓		✓	✓	✓	✓	✓	✓
	✓		✓		✓	✓	✓		✓		✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Introduction
Topic 2.	Fundamental Concepts of Equipment Economic.
Topic 3.	Planning for Earth Work Construction.
Topic 4.	Planning for Building Construction.
Topic 5.	Cost of concrete form
Topic 6.	Developing a Network Model.
Topic 7.	Precedence Diagrams

48	Course Syllabi – ABET Format
492CE-2 : Graduation Project (2)	492همد –2: مشروع تخرج 2

Program/Department	Civil Engineering Program	Code	CE

1. Course number and name	
Course Code	492CE-2
Course Title	Graduation Project (2)

2. Credits and contact hours	
Credit Hours	2(2,0,1) Credit Hours (theory , Lab/practical , tutorial)
Contact Hours	2 Hours / week for 15 weeks

3. Instructor's or course coordinator's name	
Name of Instructors	Dr. Abdullah Al-Homidy
Name of coordinator	Dr. Abdullah Al-Homidy

4. Text book, title, author, and year	
Text Book	To be specified by instructor, based on literate review.
other supplemental materials	To be specified by instructor, based on literate review.

5. Specific course information		
Catalog description	Continuation of part I of the project including : running and finalizing the experimental program or the mathematical / computer model, analyzing the results and findings and drawing the conclusion, writing the complete project report, presenting and defending the project.	
Prerequisites	491CE-2	
Co-requisites	None	
Indicate whether a required, elective, or selected elective		Core (required)

6. Specific goals for the course	
CO1	Identify, formulate and solve the analytical and numerical problems associated with the project
CO2	Design a system, component or process with defined constraints of the project
CO3	Plan, design and conduct the laboratory or numerical experiments required for the project and to analyze and interpret the data
CO4	Describe the economic and environmental impact and contemporary issues of the project2 and various alternative solutions
CO5	Function as a member of a multi-disciplinary team
CO6	Idetify the codes and local laws regulating various aspects of the project and apply the codes wherever possible
CO7	Identify and analyze a situation involving professional ethics and to make a decision
CO8	Prepare an engineering report of the project and present it demonstrating engineering communication skills
CO9	Collect data and information required to complete the project from Library and Internet resources

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

CO	SO											PEO				
	a	b	c	d	e	f	g	h	i	j	k	1	2	3	4	5
CO1	✓				✓						✓	✓	✓	✓	✓	✓
CO2			✓			✓					✓	✓	✓	✓	✓	✓
CO3		✓									✓	✓	✓	✓	✓	✓
CO4								✓		✓		✓	✓	✓	✓	✓
CO5				✓								✓	✓	✓	✓	✓
CO6						✓						✓	✓	✓	✓	✓
CO7						✓						✓	✓	✓	✓	✓
CO8							✓				✓	✓	✓	✓	✓	✓
CO9									✓		✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

7. Brief list of topics to be covered	
Topic 1.	Continuation of part I of the project including : running and finalizing the experimental program or the mathematical / computer model.
Topic 2.	analyzing the results.
Topic 3.	findings and drawing the conclusion
Topic 4.	writing the complete project report
Topic 5.	presenting and defending the project.