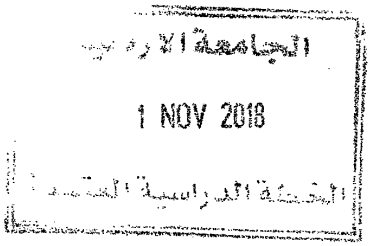
1.	**School**	Engineering
2.	**Department**	Civil Engineering
3.	**Program Title (Arabic)**	بكالوريوس الهندسة المدنية
4.	**Program Title (English)**	Bachelor of Civil Engineering

5. **Components of Curriculum:** The curriculum for the bachelor's degree in Civil Engineering consists of (163) credit hours distributed as follows:

Credit Hours	Type of Requirement	Component
27	**University Requirements**	**First**
27	**School Requirements**	**Second**
109	**Department Requirements**	**Third**
-	**Free Courses**	**Fourth**
163	**Total**	

***Practical Training:** The student should complete 8 weeks of training after passing (115 Cr. Hrs.) according to the regulations of the School of Engineering



6. Numbering System:

A- Department Number:

Department	Number
General	**0**
Civil Engineering	**1**
Architectural Engineering	**2**
Electrical Engineering	**3**
Mechanical Engineering	**4**
Chemical Engineering	**5**
Industrial Engineering	**6**
Computer Engineering	**7**
Mechatronics Engineering	**8**

B- Course number:

Domain Number	Domain Title	Domain Number	Domain Title
0	General	5	Structural Design
1	------	6	Water Resources
2	Project Management and Economy	7	Environmental Engineering
3	Geotechnical Engineering	8	Transportation and Surveying
4	Structural Analysis		

C- Course number consists of 7 digits:

School		Department		Level	Domain	Serial Number
0	9	0	1	---		

First: University Requirements:

All students admitted to the University must apply for a degree examination in Arabic, English and the Computer prepared or approved by the University to determine their level. Based on the results of the examinations, either the student will study one or more of the requirements of the preparatory program.

Preparation Program Requirements
(0 - 15 Credit Hours)

No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Basics of Arabic	3201099	3	3201098	Pass/Fail
2	Arabic Language Skills	3201100	3	3201099	Pass/Fail
3	Basics of English	3202099	3	3202098	Pass/Fail
4	English Language Skills	3202100	3	3202099	Pass/Fail
5	Basics of Computing	1932099	3	1902098	Pass/Fail

Compulsory Requirements
(18 Credit Hours)

No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Military Sciences	2220100	3		
2	National Culture	3400100	3		
3	Learning & Research Skills	3400101	3	3202099 3201099 1932099	
4	Communication Skills	3400102	3	3400101	
5	Introduction to Philosophy and Critical Thinking	3400103	3	3400101	
6	Human Civilization	3400104	3		
7	Campus Life and Ethics	3400105	Zero credit		

Electives (9 Credit Hours) (3 Credit Hours from Each Group) (First Group)					
No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Great Books	3400107	3		
2	Islam and Contemporary Issues	0400101	3		
3	Arab-Islamic Civilization	2300101	3		
4	Jordan: History and Civilization	2300102	3		
5	Jerusalem	3400108	3		
Electives (Second Group)					
No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Legal Culture	1000102	3		
2	Environmental Culture	0300102	3		
3	Physical Fitness Culture	1100100	3		
4	Islamic Culture	0400102	3		
5	Health Culture	0720100	3		

Electives (Third Group)					
No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Entrepreneurship & Creativity	3400109	3		
2	Foreign Language	2200103	3		
3	Electronic Commerce	1600100	3		
4	Social Media	1900101	3		
5	Appreciation of Arts	2000100	3		
6	Special Subject	3400106	3		
7	Management Skills	1601105	3		

Third: School courses: (27) credit hours distributed as follows:

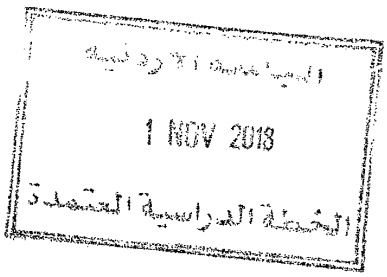
A. **Obligatory School courses: (27) credit hours**

B. **Elective School courses: (0) credit hours**

Obligatory School courses: (27) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Prerequisite
		Theoretical	Practical		
0301101	Calculus I	3	-	3	-
0301102	Calculus II	3	-	3	0301101
0301201	Calculus III	3	-	3	0301102
0302101	General Physics I	3	-	3	-
0302102	General Physics II	3	-	3	0302101
0302111	Practical Physics I	-	3	1	0302101*
0302112	Practical Physics II	-	3	1	0302102*
0966111	Engineering Workshops	-	3	1	-
0904131	Engineering Graphics & Descriptive Geometry	3	-	3	-
0901420	Engineering Economy	3	-	3	Passing 90 Cr. Hrs.
1931102	Computer Skills for Scientific Faculties	3	-	3	01932099

*** Or Concurrent**



Fourth: Specialty courses: (109) credit hours distributed as follows:

A. **Obligatory specialty courses: (100) credit hours**

B. **Elective specialty courses: (9) credit hours**

Obligatory specialty courses: (100) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Prerequisite
		Theoretical	Practical		
0301202	Engineering Mathematics I	3	-	3	0301201
0303101	General Chemistry I	3	-	3	-
0303102	General Chemistry II	3	-	3	0303101
0333109	Experimental General Chemistry for None Chemistry Students	-	3	1	0303101*
0914223	Dynamics for Civil Engineers	3	-	3	0901241
0931230	Geology	3	-	3	-
0941231	Geotechnical Engineering	3	-	3	0931230, 0941242, 0901361
0931232	Geotechnical Engineering Lab.	-	3	1	0941231*
0901241	Statics	3	-	3	0301102, 0302101, 0904131
0941242	Strength of Materials	3	-	3	0901241
0951281	Surveying	3	-	3	0301102
0931282	Surveying Lab.	-	3	1	0951281*
0951301	Numerical Methods	3	-	3	0301202
0951331	Foundation Engineering	3	-	3	0931232
0941341	Structures I	3	-	3	0941242
0951342	Structures II	3	-	3	0941341

*** Or Concurrent**

Course Number	Course Title	Contact Hours		Credit Hours	Prerequisite
		Theoretical	Practical		
0941351	Properties of Concrete	3	-	3	0941242
0941352	Properties of Concrete Lab.	-	3	1	0941351*
0901361	Fluid Mechanics	3	-	3	0301202, 0914223
0931362	Hydraulic Engineering	3	-	3	0901361
0951363	Hydraulic Engineering Lab.	-	3	1	0931362*
0941371	Drinking Water Engineering	3	-	3	0931362
0931401	Statistics and Probability	3	-	3	0301102
0941421	Contracts, Specifications and Quantity Surveying	3	-	3	0931451
0931451	Reinforced Concrete I	3	-	3	0941352, 0941341
0931452	Reinforced Concrete II	3	-	3	095134 2*, 0931451
0951453	Steel Structures	3	-	3	0951342
0951464	Engineering Hydrology	3	-	3	0931362, 0931401
0941471	Waste Water Engineering	3	-	3	0941371, 0303102
0901472	Environmental Engineering Lab.	-	3	1	0333109, 0941471*
0941482	Pavement Design	3	-	3	0901484, 0941231, 0931451
0931483	Pavement Lab.	-	3	1	0941482*
0901484	Highway Engineering	3	-	3	0931282
0941521	Construction Management	3	-	3	0941421
0901572	Environmental Eng.	3	-	3	0941471
0951581	Traffic Engineering	3	-	3	0931401, 0901484
0971598	Project I	1	-	1	Passing 120 Cr. Hrs.
0971599	Project II	2	-	2	0971598
0901500	Practical Training	-	-	3	Passing 115 Cr. Hrs.

*** Or Concurrent**

Elective specialty courses: (9) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Prerequisite
		Theoretical	Practical		
0941303	Computer Applications in Structural Engineering	3	-	3	0931452
0901322	Introduction to Remote Sensing (RS) and Geographic Information System (GIS)	3	-	3	0931282
0901337	Building Construction	3	-	3	0931451
0931431	Earth Retaining Structures	3	-	3	0951331
0901503	Integrated Solid Waste Management	3	-	3	0941471
0901506	Air Pollution Control	3	-	3	0941471
0931522	Construction Methods	3	-	3	0901420
0931523	Projects Management	3	-	3	Passing 90 Cr. Hrs.
0901534	Introduction to Soil Improvement	3	-	3	0951331
0941541	Structures III	3	-	3	0951342
0941551	Reinforced Concrete III	3	-	3	0931452
0961552	Prestressed Concrete	3	-	3	0931452
0931553	Introduction to Earthquake Engineering	3	-	3	0931452
0901555	Bridge Engineering	3	-	3	0951453, 0931452
0951561	Hydraulic Structures	3	-	3	0951464
0941562	Water Resources Engineering	3	-	3	0951464
0941563	Stormwater Drainage	3		3	0951464
0901573	Environmental Impact Assessment	3	-	3	0901572*
0901574	Water Reuse	3	-	3	0941471
0931582	Transportation Engineering	3	-	3	0901484, 0951581
0901585	Railway Engineering	3	-	3	0901484
0901595	Special Topics in Civil Engineering	3	-	3	Passing 120 Cr. Hrs.

*** Or Concurrent**

Fifth: Courses offered by other faculties and departments

Course Number	Course Title	Contact Hours		Credit Hours	Prerequisite
		Theoretical	Practical		
0301101	Calculus I	3	-	3	-
0301102	Calculus II	3	-	3	0301101
0301201	Calculus III	3	-	3	0301102
0301202	Engineering Mathematics I	3	-	3	0301201
0302101	General Physics I	3	-	3	-
0302102	General Physics II	3	-	3	0302101
0302111	Practical Physics I	-	3	1	0302101*
0302112	Practical Physics II	-	3	1	0302102*
0303101	General Chemistry I	3	-	3	-
0303102	General Chemistry II	3	-	3	0303101
0333109	Experimental General Chemistry for None Chemistry Students	-	3	1	0303101*
0914223	Dynamics for Civil Engineers	3	-	3	0901241
0904131	Engineering Graphics and Descriptive Geometry	3	-	3	-
0966111	Engineering Workshops	-	3	1	-
1931102	Computer Skills for Scientific Faculties	3	-	3	1932099

*** Or Concurrent**

Sixth: Advisory Study Plan:

First Year

(First) Semester			(Second) Semester		
Course Number	**Course Title**	**Credit Hours**	**Course Number**	**Course Title**	**Credit Hours**
0301101	Calculus I	3	0301102	Calculus II	3
0302101	General Physics I	3	0302102	General Physics II	3
0302111	Practical Physics I	1	0302112	Practical Physics II	1
0303101	General Chemistry I	3	0303102	General Chemistry II	3
0333109	Experimental General Chemistry for None Chemistry Students	1	0904131	Engineering Graphics and Descriptive Geometry	3
3400101	Learning and Research Skills	3	3400102	Communication Skills	3
0966111	Engineering Workshops	1			
3400105	Campus Life and Ethics	0			
Total		**15**	**Total**		**16**

Second Year

(First) Semester			(Second) Semester		
Course Number	**Course Title**	**Credit Hours**	**Course Number**	**Course Title**	**Credit Hours**
0301201	Calculus III	3	0301202	Engineering Mathematics I	3
0931230	Geology	3	0951281	Surveying	3
0901241	Statics	3	0931282	Surveying Lab.	1
1931102	Computer Skills for Scientific Faculties	3	0914223	Dynamics for Civil Engineers	3
3400100	National Culture	3	0941242	Strength of Materials	3
			2220100	Military Science	3
Total		**15**	**Total**		**16**

Third Year

(First) Semester			(Second) Semester		
Course Number	**Course Title**	**Credit Hours**	**Course Number**	**Course Title**	**Credit Hours**
0951301	Numerical Methods	3	0941231	Geotechnical Engineering	3
0941341	Structures I	3	0931232	Geotechnical Engineering Lab.	1
0941351	Properties of Concrete	3	0951342	Structures II	3
0941352	Properties of Concrete Lab.	1	0931362	Hydraulic Engineering	3
0901361	Fluid Mechanics	3	0951363	Hydraulic Engineering Lab.	1
0931401	Statistics and Probability	3	0931451	Reinforced Concrete I	3
			3400103	Introduction to Philosophy and Critical Thinking	3
Total		**16**	**Total**		**17**

Fourth Year

(First) Semester			(Second) Semester		
Course Number	**Course Title**	**Credit Hours**	**Course Number**	**Course Title**	**Credit Hours**
0941371	Drinking Water Engineering	3	0941421	Contracts, Specifications, and Quantity Surveying	3
0901420	Engineering Economy	3	0931452	Reinforced Concrete II	3
0951453	Steel Structures	3	0951464	Engineering Hydrology	3
0901484	Highway Engineering	3	0941471	Waste Water Engineering	3
---	University Elective	3	0901472	Environmental Engineering Lab	1
---	Elective Specialty Course	3	0941482	Pavement Design	3
			0931483	Pavement Lab.	1
Total		**18**	**Total**		**17**

Fifth Year

(First) Semester			(Second) Semester		
Course Number	**Course Title**	**Credit Hours**	**Course Number**	**Course Title**	**Credit Hours**
0951331	Foundation Engineering	3	0951581	Traffic Engineering	3
0941521	Construction Management	3	---	Elective Specialty Course	3
0901572	Environmental Engineering	3	3400104	Human Civilization	3
---	Elective Specialty Course	3	---	University Elective	3
---	University Elective	3	0971599	Project II	2
0971598	Project I	1			
Total		**16**	**Total**		**14**

Course Description

0301101 **Calculus I** **(3 Cr. Hrs.)**

Prerequisite: (---)

Functions: domain, operations on functions, graphs of functions, trigonometric functions, limits: meaning of a limit, computational techniques, limits at infinity, infinite limits, continuity, limits and continuity of trigonometric functions. The derivative: techniques of differentiation, derivatives of trigonometric functions, the chain rule, implicit differentiation, differentials, Roll's Theorem, the mean value theorem, the extended mean value theorem, L'Hopital's rule, increasing and decreasing functions, concavity, maximum and minimum values of a function, graphs of functions including rational functions (asymptotes) and functions with vertical tangents (cusps), antiderivatives, the indefinite integral, the definite integral, the fundamental theorem of calculus, the area under a curve, the area between two curves. Transcendental functions: inverse functions, logarithmic and exponential functions, derivatives and integrals, limits (the indeterminate forms), hyperbolic functions and their inverses, inverse trigonometric functions.

0301102 **Calculus II** **(3 Cr. Hrs.)**

Prerequisite: (Calculus I - 0301101)

Techniques of integration: integration by substitution, integration by parts, integrating powers of trigonometric functions, trigonometric substitutions, integrating rational functions, partial fractions, rationalization, miscellaneous substitution. Improper integrals, application of definite integral: volumes, length of a plane curve, area of a surface of revolution polar coordinates and parametric equations: polar coordinates, graphs in polar coordinates, area in polar coordinates, infinite series: sequences, infinite series, convergence tests, absolute convergence, conditional convergence, alternating series, power series: Taylor and Maclurine series, differentiation and integration of power series.

0301201 **Calculus III** **(3 Cr. Hrs.)**

Prerequisite: (Calculus II - 0301102)

Three dimensional space and vectors rectangular coordinates in 3D, spheres, cylindrical surfaces, quadric surfaces, vectors: dot product, projections, cross product, parametric equations of lines planes in 3-spaces, vector -valued functions: calculus of vector valued functions, change of parameters, arc length, unit tangent and normal vectors, curvature, functions of two or more variables: domain, limits, and continuity, partial derivatives, differentiability, total differentials, the chain rule, the gradient, directional derivatives, tangent planes, normal lines; maxima and minima of functions of two variables, Lagrange multipliers, multiple integrals: double integral, double integrals in polar coordinates, triple integrals, triple integrals in cylindrical and spherical coordinates, change of variables in multiple integrals, Jacobian .

0302101 **General Physics I** **(3 Cr. Hrs.)**
Prerequisite: (-)
Motion in one dimension, vectors, motion in two dimensions, the laws of motion, circular motion, conservation of energy, linear momentum and collisions, rotation of a rigid object about a fixed axis, angular momentum, static equilibrium, universal gravitation, fluid mechanics, oscillatory motion.

0302102 **General Physics II** **(3 Cr. Hrs.)**
Prerequisite: (General Physics I - 0302101)
Electric field, Gauss's law, electric potential, capacitance and dielectrics, current and resistance, direct current circuits, magnetic field, sources of the magnetic field, Faraday's law, inductance, alternating current circuits, the nature of light and the principles of ray optics, image formation.

0302111 **Practical Physics I** **(1 Cr. Hr.)**
Prerequisite or Concurrent: (General Physics I - 0302101)
11 experiments each of 3 hrs/week duration: collection and analysis of data, measurements and uncertainties, vectors: force table, kinematics of rectilinear motion, force and motion, collision in two dimensions, rotational motion, simple harmonic motion: simple pendulum, gas's Laws, ballistic pendulum, specific heat capacity of metals.

0302112 **Practical Physics. II** **(1 Cr. Hr.)**
Prerequisite or Concurrent: (General Physics II - 0302102)
12 experiments each of 3 hrs /week duration: electric field mapping, specific charge of copper ions, power transfer, potentiometer, capacitors: RC time constant, Kirchhoff's laws, magnetic field of a current, lenses, Young's double slit experiment, electromagnetic induction, Ohm's law, Wheatstone bridge.

0966111 **Engineering Workshops** **(1 Cr. Hr.)**
Prerequisite: (-)
General safety, materials and their classifications, measuring devices and their accuracy, fits and tolerances, theoretical background for the practical exercises including fitting, forging, carpentry, casting, welding, mechanical saws, shearers, drills, lathes, milling machines, shapers and grinders.

0904131 **Engineering Graphics and Descriptive Geometry** **(3 Cr. Hrs.)**
Prerequisite: (-)
Drawing equipment and use of instruments. Lettering, geometric construction, sketching and shape description. Basic descriptive geometry, developments and intersections. Axonometric, oblique and perspective drawings, Multiview projection, principal views, conventional practice, and sectional views. Auxiliary views. Dimensioning techniques. Parallel: introduction to computer drawing, drawing aids, geometrical construction, and the appropriate commands of text, editing, plotting, sections, layers, pictorial views, and dimensioning. Auxiliary views.

0901420 **Engineering Economy** **(3 Cr. Hrs.)**
Prerequisite: (Passing 90 Cr. Hr.s.)
Major elements of feasibility studies. Principles of engineering economy. Equivalence and compound interest formulas. Single payment model. Uniform payment model. Gradient payment model. Exponential payment model. Decision criteria for single and multiple alternatives: present worth, annual worth, future worth, internal rate of return, benefit cost ratio and payback methods. Income-tax effect on decision making.

1931102 **Computer Skills for Scientific Faculties** **(3 Cr. Hrs.)**
Prerequisite: (Basics of Computing - 1932099)
Fundamental concepts of programming using C++, basic structures of programming tools: variable names, data types, control structures, arrays, functions, pointers, introduction to classes and objects, inheritance, applications using C++. Weekly practice in the lab.

0301202 **Engineering Mathematics I** **(3 Cr. Hrs.)**
Prerequisite: (Calculus III - 0301201)
Ordinary differential equations, linear differential equations of second and higher order, systems of differential equations, phase plane, stability, series solutions of differential equations, orthogonal function, Laplace transforms, linear systems of equations, matrices and determinants.

0303101 **General Chemistry I** **(3 Cr. Hrs.)**
Prerequisite: (-)
Measurements and significant figures, chemical reactions, stoichiometry, the gaseous state, thermochemistry, electronic structure and periodicity, chemical bonding, molecular shapes, states of matter and intermolecular forces.

0303102 **General Chemistry II** **(3 Cr. Hrs.)**
Prerequisite: (General Chemistry I - 0303101)
Physical properties of solutions, chemical kinetics, chemical equilibrium, chemical thermodynamics, acid-base equilibria in aqueous solutions, solubility and complex ion equilibria, electrochemistry.

0333109 **Experimental General Chemistry For None Chemistry Students** **(1 Cr. Hr.)**
Prerequisite or Concurrent: (General Chemistry I - 0303101)
The course includes experiments dealing with the following topics: safety and laboratory rules, chemical observations, stoichiometry, volumetric analysis, oxidation and reduction, colligative properties, thermochemistry and equilibrium.

0914223 **Dynamics for Civil Engineers** **(3 Cr. Hrs.)**
Prerequisite: (Statics - 0901241)
Kinematics of particles, Rectilinear and curvilinear motion in various coordinate systems. Kinetics of particles, Newton's second law, Equations of motion for single and for a system of particles. Work and energy, work of a force conservation of energy, power and efficiency. Impulse and momentum, principle of linear impulse and momentum for a single and for a system of particles, angular impulse and momentum principle, introduction to vibrations and linear systems, steady fluid streams.

0931230 **Geology** **(3 Cr. Hrs.)**
Prerequisite: (-)
Introduction to Geology, basic scientific concepts and principles of earth sciences, minerals and rocks, the rock cycle, geologic time scale and event sequences, superficial deposits and major principles of physical geology, structural geology, plate tectonics. Earthquakes: mechanisms, ground motion and secondary consequences. Volcanism and other mountain building processes. Ground water, site investigation, engineering geology in practice, properties and classification of rocks, use of rocks for engineering purposes.

0941231 **Geotechnical Engineering** **(3 Cr. Hrs.)**
Prerequisites: (Geology – 0931230, Fluid Mechanics – 0901361, Strength of Materials - 0941242)
Indexed properties of soil plasticity and structure of the soil, engineering classification of the soil, soil compaction, permeability and seepage, flow net, in situ stresses, stresses in a soil mass, soil compressibility and consolidation theory, time-settlement analysis, shear strength of soils.

0931232 **Geotechnical Engineering Lab.** **(1 Cr. Hr.)**
Prerequisite or Concurrent: (Geotechnical Engineering - 0941231)
Water content, specific gravity, consistency limits, grain-size distribution, hydrometer analysis, compaction, in-situ field density, permeability tests, consolidation test, direct shear test, triaxial test, unconfined compression test.

0901241 **Statics** **(3 Cr. Hrs.)**
Prerequisites: (Calculus II - 0301102, General Physics I - 0302101, Eng. Graphics & Descriptive Geometry - 0904131)
General principles. Force vectors, force systems (2D and 3D). Equilibrium of particles and rigid bodies (2D and 3D), free body diagrams, constraints and structural determinacy, structures (trusses, frames and machines), distributed forces (centroids and centers of mass), fluid pressure, beams (shear force and bending moment diagrams), friction, moments of inertia and virtual work.

0941242 **Strength of Materials** **(3 Cr. Hrs.)**
Prerequisite: (Statics - 0901241)
Equilibrium of deformable bodies, average normal and shear stress, bearing stress, allowable stress, factor of safety, normal and shear strain. The tension test, Hooke's law, Poisson's ratio, elastic deformation of axially loaded members, statically indeterminate axially loaded members. Thermal stresses. The torsion formula, solid and hollow shafts, thin-walled tubes, power transmission. Shear and moment diagrams. The flexure formula, bending of composite beams, stress concentrations, eccentric axial loading, un-symmetric bending. The shear formula, shear stresses in beams, shear flow in built-up members. Plane stress transformation, general equations of plane stress transformation. Mohr's circle. The state of stress caused by combined loading.

0951281 **Surveying** **(3 Cr. Hrs.)**
Prerequisite: (Calculus II - 0301102)
Principles and basic definitions, units of measurements, plotting scale, linear measurements, levelling, bearings, the theodolite, total station and applications, contour lines, traversing and coordinate determination, locating points by intersection and resection, areas and volumes, curve ranging.

0931282 **Surveying Lab.** **(1 Cr. Hr.)**
Prerequisite or Concurrent: (Surveying - 0951281)
Distance measurement and adjustment, levelling exercises, theodolite exercises, contouring exercises, topographic surveys, determination of areas and volumes, traversing exercises.

0951301 **Numerical Methods** **(3 Cr. Hrs.)**
Prerequisite: (Engineering Mathematics I - 0301202)
Algorithms to solve linear and non-linear equations. Solution of simultaneous linear equations using various methods: Gaussian elimination, Gauss-Jordan and Iterative Gauss-Seidel method. Solution using optimization techniques: unconstrained and constrained optimization. Curve fitting: Least square regression, Newton divided difference interpolation, Lagrange interpolation, Spline interpolation and Fourier Approximation. Numerical differentiation and integration. Numerical solution of ordinary differential equations: Runge-Kutta methods. Introduction to partial differential equation methods: Finite element method and finite difference method.

0951331 **Foundation Engineering** **(3 Cr. Hrs.)**
Prerequisite: (Geotechnical Engineering Lab - 0931232)
Soil mechanics review, foundations definitions and types, distribution of stresses in soils, bearing pressure, bearing capacity of soils, rectangular combined footing, mat foundations, settlement of shallow foundations, deep foundations capacity and settlement, lateral earth pressure and retaining walls, stability of slopes.

0941341 **Structures I** **(3 Cr. Hrs.)**
Prerequisite: (Strength of Materials - 0941242)
Classification of structures, types of supports, stability and classification of statically determinate and indeterminate beams, trusses and frames. Loads and forces and their combinations, load paths. Internal loads in members and structures, shear, moment and axial force diagrams for determinate beams and frames. Plane truss analysis, method of joints, method of sections, complex and space trusses. Analysis of statically determinate cables and arches. Deflections, direct integration method, conjugate beams, moment-area theorems, and real and virtual work methods. Introduction to analysis of statically indeterminate structures, Maxwell's reciprocal theorem. Moving loads and influence lines for determinate structures including beams, girders and trusses.

0951342 **Structures II** **(3 Cr. Hrs.)**
Prerequisite: (Structures I - 0941341)
Introduction to indeterminate structures, degree of freedom, static and kinematic indeterminacy, principle of superposition. Deflections by force methods for single and multiple degree of indeterminacy, method of consistent deformations, theorem of three moment equations, least work and Castigliano's second theorem. Deflections by displacement methods for beams and frames, frames with/without sways, slope deflection method, moment distribution method, analysis methods for different structures subjected to symmetric or anti-symmetric loadings. Deflection due to thermal effects, fabrication errors and supports settlement. Introduction to analysis by matrix method.

0941351 **Properties of Concrete** **(3 Cr. Hrs.)**
Prerequisite: (Strength of Materials - 0941242)
Concrete constituents and their principal roles in concrete performance. Cement: manufacture and types, contents, properties. Cement hydration reactions, concrete microstructure formation, hydration products and their influence to final concrete qualities. Setting, hardening and heat of hydration relationships and their significance. Fresh concrete: workability, segregation and mixing tests of fresh concrete. Other cementations materials and their effects on hydration process and ultimate concrete behaviour. Aggregate selection: physical and chemical properties affecting the performance of fresh and hardened concrete. Admixtures: chemical and physical effects on concrete behaviour both in fresh and hardened state. Additives: chemical and physical effects on concrete behaviour. Strength of concrete: compressive, tensile and flexural. Elasticity, shrinkage and creep. Testing of hardened concrete. Mix design. Durability problems in concrete.

0941352 **Properties of Concrete Lab.** **(1 Cr. Hr.)**
Prerequisite or Concurrent: (Properties of Concrete - 0941351)
Mineral aggregates, properties and testing. Portland Cement: composition, hydration, properties and testing. Proportioning concrete mixes. Testing of fresh concrete. Mechanical properties and testing of hardened concrete. Non-destructive evaluation methods.

0901361 **Fluid Mechanics** **(3 Cr. Hrs.)**
Prerequisites: (Engineering Mathematics I – 0301202, Dynamics for Civil Engineers - 0914223,)
Fluid properties. Fluid in static and flowing conditions. Pressure variations. Control volume approach. Conservation of mass, conservation of momentum, conservation of Energy. Dimensional analysis and simulated flow in closed conduits.

0931362 **Hydraulic Engineering** **(3 Cr. Hrs.)**
Prerequisite: (Fluid Mechanics - 0901361)
Hydraulics of pipe network. Introduction of hydro-machinery: pumps and turbines. Pumps selection. Pumps in-parallel and in-series. Uniform flow in open channels. Varied flow in open channels. Fluid measurements.

0951363 **Hydraulic Engineering Lab.** **(1Cr. Hr.)**
Prerequisite or Concurrent: (Hydraulic Engineering - 0931362)
Center of pressure, force on gates, triangular and rectangular notches, Venturi and orifice meters, impact of a jet, head loss in pipes, specific energy, critical depth, turbulent pipe flow, centrifugal pumps, axial flow pumps, hydraulic jump.

0941371 **Drinking Water Engineering** **(3 Cr. Hrs.)**
Prerequisite: (Hydraulic Engineering - 0931362)
Sources of drinking water, water demand, design period, population forecasting. Water distribution network design. Physical, chemical, biological and radiological properties of water. Drinking water treatment and disinfection. Introduction to advanced water treatment.

0931401 **Statistics and Probability** **(3 Cr. Hrs.)**
Prerequisite: (Calculus II - 0301102)
Descriptive statistics, discrete and continuous random variables and probability distributions, joint probability distributions, point and interval estimation, tests of hypothesis, correlation and regression, analysis of variance, time series. Computer applications.

0941421 **Contracts, Specifications and Quantity Surveying** **(3 Cr. Hrs.)**
Prerequisite: (Reinforced Concrete I - 0931451)
Contractual procedures, contract types and contract documents. The legal aspects of contracts and tenders, types of construction documents including contracts and bonds, focus on the general of the construction contract (FIDIC), formulation of the building specifications and technical interpretation, their application to the selection and installation of materials and equipment in the construction projects, the quantity take-off and BOQ, term project consisting of preparing tender documents for a building project.

0931451 **Reinforced Concrete I** **(3 Cr. Hrs.)**
Prerequisites: (Structures I – 0941341, Properties of Concrete Lab - 0941352)
Introduction to design philosophy and bases, design codes and specifications, loads, load combinations and load paths. Properties and tests of concrete and steel materials. Design methods, strength design method, flexural analysis and design of beams, cracked and un-cracked sections, concepts of ductile and brittle behavior, tension- and compression-controlled members and strength reduction factors. Design for flexural bending, singly and doubly reinforced rectangular beams, T-sections and other shapes, design of one-way solid slabs. Design of beams for shear and diagonal tension. Requirements for bond, anchorage and development lengths. Serviceability requirements, deflection and cracking control, shrinkage and creep deflections. Analysis and design of short (non-slender) columns, pure axially loaded short columns, interaction diagrams, eccentrically loaded short columns, short columns subjected to compression plus uniaxial bending.

0931452 **Reinforced Concrete II** **(3 Cr. Hrs.)**

Prerequisite: (Reinforced Concrete I- 0931451)

Concurrent or Prerequisite: (Structures II - 0951342)

Review of design methods and bases, limit states, strain limits. Load distribution and transfer, one-way and two-way slabs, Design of two-way solid slabs using ACI Direct Design Method, design of two-way solid slabs using approximate coefficient methods, design of one-way and two way ribbed slabs. Design for torsion. Design of slender columns, moment magnification and second-order effects. Design of columns in braced and non-braced frames. Design of non-load bearing walls, load bearing walls, and retaining walls. Design of concentric and eccentric foundations, wall footings, isolated footings, combined and continuous footings, and strap beam foundations.

0951453 **Steel Structures** **(3 Cr. Hrs.)**

Prerequisite: (Structures II - 0951342)

Material properties of structural steel, design philosophies: Load resistant factor design (LRFD) /allowable strength design (ASD). Types of loads and load combinations. Tension members: behaviour and strength of tension members, influence of hole placement, design of tension members. Compression members: Euler column buckling, effective length of columns and slenderness, effect of residual stresses and initial imperfections, column strength by AISC provisions, local buckling, built-up members. Beams: lateral torsional buckling, local buckling, and beam strength by AISC provisions, shear strength, biaxial bending, deflection, shear center. Beam-column: second-order effects, moment magnification method, design of beam-columns by AISC provisions. Bolted connections: types and failure modes, design of simple bolted connections. Welded connections: types and failure modes, design of simple welded connections.

0951464 **Engineering Hydrology** **(3 Cr. Hrs.)**

Prerequisite: (Statistics and Probability - 0931401, Hydraulic Engineering Lab - 0951363)

The hydrologic cycle and its components: precipitation, evaporation and transpiration, infiltration, and steam flow. Rainfall-runoff analysis and its application. Peak flow calculations. Design floods: hydrologic forecast and design criteria. Introduction to groundwater hydrology and well hydraulics. Computer applications on hydrologic modelling.

0941471 **Waste Water Engineering** **(3 Cr. Hrs.)**

Prerequisite: (General Chemistry II – 0303102, Drinking Water Engineering - 0941371,)

Quantities and characteristics of waste water. Design of municipal sewer systems. Municipal waste water treatment: pre-treatment and flow equalization, primary treatment, secondary treatment, activated sludge and trickling filters. Introduction to sludge treatment and disposal.

0901472 **Environmental Engineering Lab.** **(1 Cr. Hr.)**
Prerequisite: (Experimental General Chemistry - 0333109),
Concurrent or Prerequisite: (Waste Water Engineering - 0941471)
Physical and biological characterization of water and waste water, laboratory application of various physical, chemical, and biological processes, employed in environmental engineering practice such as: coagulation-flocculation, sedimentation, filtration and biological processes.

0941482 **Pavement Design** **(3 Cr. Hrs.)**
Prerequisites: (Highway Eng. - 0901484, , Reinforced Concrete I - 0931451, Geotechnical Eng. - 0941231)
Pavement types, stress, strain and deflection analysis for flexible and rigid pavements, vehicle and traffic consideration, structural design of flexible and rigid pavements, pavement materials: bituminous materials and their uses, asphalt concrete mix design, pavement distress and maintenance, preparation and construction of pavements. Planning of maintenance works.

0931483 **Pavement Lab.** **(1 Cr. Hr.)**
Prerequisite or Concurrent: (Pavement Design - 0941482)
Includes the following tests: penetration, softening point, flash point, ductility, CBR, viscosity, stripping, loss on heat, Marshall, extraction, aggregate air content, specific gravity, skid resistance, profilograph, and surface texture.

0901484 **Highway Engineering** **(3 Cr. Hrs.)**
Prerequisite: (Surveying Lab - 0931282)
The concept of highway planning, basic principles, techniques and controls of highway design, route location, geometric design, sight distance, horizontal and vertical alignment, cross-section elements, drainage and drainage structures, intersection design, grade separation and interchanges, earthwork requirements and operations, construction contracts and supervision.

0941521 **Construction Management** **(3 Cr. Hrs.)**
Prerequisite: (Contracts, Specs. and Quantity Surveying - 0941421)
Planning, construction management concepts, network analysis using precedence technique, overlapping networks, project monitoring, project control, time-cost trade off, recourse levelling, network-analysis using arrow techniques PERT.

0901572 **Environmental Engineering** **(3 Cr. Hrs.)**
Prerequisite: (Waste Water Engineering - 0941471)
Air pollution analysis and control. Solid and hazardous waste management. Noise pollution analysis and control. Environmental laws and regulations in Jordan. Risk assessment.

0951581 **Traffic Engineering** **(3 Cr. Hrs.)**
Prerequisites: (Highway Eng. - 0901484, Statistics and Probability - 0931401)
Traffic system elements, driver, pedestrian, and vehicle characteristics, traffic flow characteristics. Traffic studies, traffic volume, speed, travel time and delay, origin-destination, accidents and traffic impact analysis, capacity and level of service, traffic signals and traffic control devices, traffic management.

0971598 **Project I** **(1 Cr. Hr.)**
Prerequisite: (Passing 120 Cr. Hr.s.)
Integrated systematic team approach to civil planning, analysis, evaluation, and design for complete large scale projects in civil engineering areas with interactions with other scientific and engineering disciplines. Establishment of performance criteria, economic analysis, identification of potential problems regarding ethical conduct and professional engineering practice are emphasized.

0971599 **Project II** **(2 Cr. Hrs.)**
Prerequisite: (Project I - 0971598)
Continuation to Project I.

0941303 **Computer Applications in Structural Engineering** **(3 Cr. Hr.)**
Prerequisite: (Reinforced Concrete II - 0931452)
Analysis of different types of structures using available computer packages like SAP2000 and ETABS. Analysis of prismatic and non-prismatic continuous beams under general loading. Pattern loading according to ACI-318. Analysis of 2D and 3D Trusses. Analysis of prismatic and non-prismatic plane frames. Analysis of arches. Analysis of footings as beams on elastic foundation. Analysis of one-way ribbed floor systems. Finite element analysis of two-way floor systems. Center of mass and center of rigidity. Lateral distribution of earthquake forces. Temperature loading. Modeling and analysis of water tanks. Analysis of highway bridges.

0901322 **Introduction to Remote Sensing (RS) and Geographic Information System (GIS)** **(3 Cr. Hrs.)**
Prerequisite: (Surveying Lab - 0931282)
Introduction to remote sensing, energy sources and physical principles, radiation emission, Planck's equation, energy interaction with earth surface features, introduction to remote sensing satellites. The nature of GIS, the real world and its representations, geographic information and geospatial data types, spatial referencing and positioning, methods of data capture and sources of data. Upon completion, students should be able to know the principles of remote sensing and to identify GIS hardware components, typical operations, products/applications, and differences between database models and between raster and vector systems.

0901337 **Building Construction** **(3 Cr. Hrs.)**
Prerequisite: (Reinforced Concrete I - 0931451)
Historical review of building systems development. Introduction to the structural elements in buildings function and analysis of determinate members. Structural loads, building materials with emphasis on local materials. Timber and formwork. Provision of joints in structures. Finishing-tile, plastering.

0931431 **Earth Retaining Structures** **(3 Cr. Hrs.)**
Prerequisite: (Foundation Engineering - 0951331)
Review of fundamentals and lateral earth pressure. Design of gravity retaining wall, cast-In-Place retaining walls, mechanically stabilized earth walls, sheet pile walls, anchored sheet pile walls, braced excavation systems, soldier pile wall with lagging, slurry wall, gabions, soil nail wall, case studies. Computer applications.

0901503 **Integrated Solid Waste Management** **(3 Cr. Hrs.)**
Prerequisite: (Waste Water Engineering - 0941471)
Laws and regulations for solid waste management. Waste sources, characteristics, generation, collection, transfer and transport. Waste recycling, reuse, recovery, treatment and disposal. Hazardous waste management issues and productivity. Hazardous treatment and disposal. Integrated waste management strategies, disposal and diversion methods.

0901506 **Air Pollution Control** **(3 Cr. Hrs.)**
Prerequisite: (Waste Water Engineering - 0941471)
Laws and regulations for protecting the air quality. Design principles and economics of particulate and gaseous pollutants emission controls. Emissions from mobile sources and vehicles emission control.

0931522 **Construction Methods** **(3 Cr. Hrs.)**
Prerequisite: (Engineering Economy - 0901420)
Basics of earthmoving, understanding and selection of a construction equipment l, earthmoving equipment: bulldozers, loaders, scrapers, trucks and wagons, compaction equipment, excavators, and shovels, lifting mechanisms such as buckets and cranes, fleet productivity, factors influencing fleet productivity, asphalt machines, equipment for concrete works, economic analysis of the equipment cost. Design of formworks.

0931523 **Projects Management** **(3 Cr. Hrs.)**
Prerequisite: (Passing 90 Cr. Hrs.)
Project management concepts, construction strategic planning, legal aspects of the construction process, management structure, project finance and funding, budgeting, construction inventory management, personnel management, manpower planning, total quality management.

0901534 **Introduction to Soil Improvement** **(3 Cr. Hrs.)**
Prerequisite: (Foundation Engineering - 0951331)
Basics of design methodologies related to densification including dynamic compaction and vibro-compaction, hydraulic modification including prefabricated vertical and horizontal drains, physical and chemical modification including admixtures, chemical and cement grouting, soil mixing, and jet grouting, use of inclusions including stone columns, dynamic replacement, soil nailing and geosynthetic reinforcement.

0941541 **Structures III** **(3 Cr. Hrs.)**
Prerequisite: (Structures II - 0951342)
Qualitative influence lines, influence lines of continuous beams, indeterminate trusses, frames and arches of prismatic and non-prismatic sections. Structural analysis using classical and matrix methods, including flexibility and stiffness methods. Analysis using matrix method for rods, plane trusses, space trusses, two and three dimensional beams, and frames. Analysis of curved beams. Principles governing analysis of special structures such as plates, domes, and shells. Introduction to finite element method. Software packages for structural modeling and analysis.

0941551 **Reinforced Concrete III** **(3 Cr. Hrs.)**
Prerequisite: (Reinforced Concrete II - 0931452)
Design of slabs using the Equivalent Frame Method, design for openings in slabs. Approximate methods for analysis and design of concrete elements and frames. Design of shear walls and basement walls. Design of stairs. Strut-and-tie models. Design of water tanks. Design of mat and pile foundations. Basic principles on design of prestressed concrete elements. Special topics.

0961552 **Prestressed Concrete** **(3 Cr. Hrs.)**
Prerequisite: (Reinforced Concrete II - 0931452)
Introduction to prestressed concrete, types and concepts of prestressed concrete, prestressing methods, types of concrete and prestressing steel, flexural analysis using elastic stresses, flexural strength analysis, partial prestressing. Flexural design of beams, beams design with load balancing. Design based on strength requirements, flexural crack control, loss of prestress force, composite beams.

0931553 **Introduction to Earthquake Engineering** **(3 Cr. Hrs.)**
Prerequisite: (Reinforced Concrete II - 0931452)
Introduction to earth and earthquake nature and characteristics, earth plate tectonics, faults, seismic waves, earthquake records, measurement, magnitude, intensity, and seismic effects on structures. Introduction to structural dynamics, period, frequency, damping, stiffness and rigidity. Single- and multi-degree of freedom systems. Seismic response of linear elastic single- and multi-degree of freedom (SDOF and MDOF) systems. Seismic design elastic response spectrum. Estimation of earthquake load by dynamic modal analysis. Analysis using generalized coordinates and Raleigh's methods. Design codes such as UBC, IBC/ASCE 7, and Jordanian Codes. Analysis of multi-storey frame and shear wall buildings using equivalent static, response spectra, and response history procedures. Vertical and horizontal distribution of lateral seismic loads.

Calculations of lateral displacements and floor drifts. Basic principles and requirements for earthquake resistant design and detailing of reinforced concrete buildings using design codes such as ACI 318.

0901555 **Bridge Engineering** **(3 Cr. Hrs.)**
Prerequisites: (Reinforced Concrete II - 0931452, Steel Structures - 0951453)
Introduction to highway bridges: types, trends, economics, aesthetic, planning and alternative designs. Principles of probabilistic design and the LRFD AASHTO Code. Highway design loads and load combinations. Bridge deck slabs: types analysis and design. Use of structural analysis software for live load analysis. Distribution of live loads to bridge girders. Analysis and design of bridge girders according to AASHTO specifications. Piers: types, analysis and design. Abutments: types, analysis and design. Bearing pads.

0951561 **Hydraulic Structures** **(3 Cr. Hrs.)**
Prerequisite: (Engineering Hydrology - 0951464)
Design of dams and spillways. Seepage and uplift pressure. Stable channel design. Design of sluice gates, flumes, settling basin. Protection works: diversion works, weirs, sediment control, falls and transitions. Cross drainage works: siphon, aqueduct, culverts and outlet works.

0941562 **Water Resources Engineering** **(3 Cr. Hrs.)**
Prerequisite: (Engineering Hydrology - 0951464)
Systems analysis of conventional and none conventional water resources: surface water, groundwater, water harvesting and water desalination Analysis and design of storage and water distribution systems. Climate change impact and mitigation in water resources. Integrated water resources management (IWRM) concept and applications. Social, environmental, economic, legal and institutional aspects in IWRM. Water challenges and strategies in Jordan and the Arab region. Application and term project.

0941563 **Stormwater Drainage** **(3 Cr. Hrs.)**
Prerequisite: (Engineering Hydrology -0951464)
Introduction to stormwater drainage, rainfall-runoff analysis, design criteria of property, drainage systems. Urban drainage and flood protection works, stormwater management. Case studies and computer application.

0901573 **Environmental Impact Assessment (EIA)** **(3 Cr. Hrs.)**
Prerequisite or Concurrent: (Environmental Eng - 0901572)
Introduction to the environmental impact assessment (EIA), Jordanian regulation for EIA, introduction to the concepts, methodologies, valued environmental components and various stages of the EIA process which include: screening, scoping, baseline conditions, evaluation and impact assessment, impact management, environmental management plan (EMP) and environmental monitoring program, EIA and EMP reporting, public consultation, reviewing, environmental auditing (EA), appeal rights and decision making.

0901574 **Water Reuse** **(3 Cr. Hrs.)**

Prerequisite: (Waste Water Engineering - 0941471)

Water reuses definitions and historical background. Environmental and health issues of water reuse. Risk assessment and risk management. Non potable and potable uses of reclaimed water: Agricultural irrigation, industrial uses, groundwater recharge, and indirect potable reuse. Case studies.

0931582 **Transportation Engineering** **(3 Cr. Hrs.)**

Prerequisites: (Highway Engineering - 0901484, Traffic Engineering - 0951581)

Transportation planning: introduction to transportation in an urban area setting, issues and challenges, modes of transportation, demand analysis, air transportation: Airport planning, aircraft characteristics, airport configuration, runway and taxiway design, apron and terminal area, rail transportation: characteristics of railways, geometric elements and design, the track system, railway interoperability. Water transportation: port classification and components, ships and their characteristics, port site selection, design of quay walls. Transportation system management. Transport project evaluation and financing.

0901585 **Railway Engineering** **(3 Cr. Hrs.)**

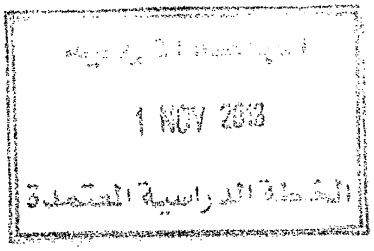
Prerequisite: (Highway Engineering - 0901484)

Characteristics of rail transport, track system, high speed trains, planning the railway activity, management of railways, forecast of rail demand, railway costs, capacity analysis, railway interoperability and standardization, problems, legal and institutional framework, technical solutions. Rail safety management, economic and financial aspects. Project management for railways, value engineering.

0901595 **Special Topics in Civil Engineering** **(3 Cr. Hrs.)**

Prerequisite: (Passing 120 Cr. Hr.s.)

Selected topics on recent developments in civil engineering directed to near-graduation students. Topics for each semester are announced at the time of course enrolment and varied from term to term. It covers issues related to specific branch in Civil Engineering (structures, material, geotechnical, water and environment, highway and traffic & project management).



Civil Engineering Department

Equivalence Table

Current Curriculum 2017/2018			Curriculum 2018/2019		
Course No.	Course Title	Cr. H.	Course No.	Course Title	Cr. H.
0904222	Dynamics	3	0914223	Dynamics for Civil Engineers	3
0901230	Engineering Geology	3	0931230	Geology	3
0941231	Geotechnical Engineering	3	0941231	Geotechnical Engineering	3
0931232	Geotechnical Engineering Lab.	1	0931232	Geotechnical Engineering Lab.	1
0901241	Statics	3	0901241	Statics	3
0941242	Strength of Materials	3	0941242	Strength of Materials	3
0951281	Surveying	3	0951281	Surveying	3
0931282	Surveying Lab.	1	0931282	Surveying Lab.	1
0941301	Engineering Numerical Methods	3	0951301	Numerical Methods	3
0901303	Computer Applications	3	0941303	Computer Applications in Structural Engineering	3
-	-	-	0901322	Introduction to Remote Sensing (RS) and Geographic Information system (GIS)	3
0941331	Foundation	3	0951331	Foundation Engineering	3
0932337	Building Construction	3	0901337	Building Construction	3
0941341	Structures I	3	0941341	Structures I	3
0951342	Structures II	3	0951342	Structures II	3
0941351	Properties of Concrete	3	0941351	Properties of Concrete	3
0941352	Properties of Concrete Lab.	1	0941352	Properties of Concrete Lab.	1
0901361	Fluid Mechanics	3	0901361	Fluid Mechanics	3
0931362	Hydraulic Engineering	3	0931362	Hydraulic Engineering	3
0941363	Hydraulics Lab.	1	0951363	Hydraulic Engineering Lab.	1
0931371	Water Supply Engineering	3	0941371	Drinking Water Engineering	3
0901401	Engineering Statistics	3	0931401	Statistics and Probability	3
0901420	Engineering Economy	3	0901420	Engineering Economy	3

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Current Curriculum 2017/2018			Curriculum 2018/2019		
Course No.	Course Title	Cr. H.	Course No.	Course Title	Cr. H.
0901421	Specifications and Contracts	3	0941421	Contracts, Specifications and Quantity Surveying	3
0931431	Earth Retaining Structures	3	0931431	Earth Retaining Structures	3
0931451	Reinforced Concrete I	3	0931451	Reinforced Concrete I	3
0931452	Reinforced Concrete II	3	0931452	Reinforced Concrete II	3
0951453	Steel Structures	3	0951453	Steel Structures	3
0941464	Engineering Hydrology	3	0951464	Engineering Hydrology	3
0941471	Waste Water Engineering	3	0941471	Waste Water Engineering	3
0901472	Environmental Engineering Lab.	1	0901472	Environmental Engineering Lab.	1
0901481	Highway Engineering	3	0901484	Highway Engineering	3
0941482	Pavement Design	3	0941482	Pavement Design	3
0901483	Highway Engineering Lab.	1	0931483	Pavement Lab.	1
-	-	-	0901503	Integrated Solid Waste Management	3
-	-	-	0901506	Air Pollution Control	3
0941521	Construction Management	3	0941521	Construction Management	3
0931522	Construction Methods	3	0931522	Construction Methods	3
0931523	Projects Management	3	0931523	Projects Management	3
-	-	-	0901534	Introduction to Soil Improvement	3
0941541	Structures III	3	0941541	Structures III	3
0941551	Reinforced Concrete III	3	0941551	Reinforced Concrete III	3
-	-	-	0961552	Prestressed Concrete	3
0931553	Introduction to Earthquake Engineering	3	0931553	Introduction to Earthquake Engineering	3
0901555	Bridge Engineering	3	0901555	Bridge Engineering	3
0951561	Hydraulic Structures	3	0951561	Hydraulic Structures	3

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Equivalence Table

Current Curriculum 2017/2018			Curriculum 2018/2019		
Course No.	Course Title	Cr. H.	Course No.	Course Title	Cr. H.
0941562	Water Resources Engineering	3	0941562	Water Resources Engineering	3
-	-	-	0941563	Stormwater Drainage	3
0901572	Environmental Engineering	3	0901572	Environmental Engineering	3
0901573	Environmental Impact Assessment	3	0901573	Environmental Impact Assessment	3
0901574	Waster Reuse	3	0901574	Water Reuse	3
-	-	-	0951581	Traffic Engineering	3
0931582	Transportations Engineering	3	0931582	Transportation Engineering	3
-	-	-	0901585	Railway Engineering	3
-	-	-	0901595	Special Topics in Civil Engineering	3
0931583	Aerial Surveying	3	-	-	-
0931584	Remote Sensing	3	-	-	-
0971598	Project I	1	0971598	Project I	1
0971599	Project II	2	0971599	Project II	2
0900500	Practical Training	0	0901500	Practical Training	3