Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Academic Program Description Form

University Name: **Wasit University**

Faculty/Institute: **College of Engineering**

Scientific Department: **Civil Engineering**

Academic or Professional Program Name: **Civil Engineering 2023–2024**

Final Certificate Name: **BSc in Civil Engineering**

Academic System: Course

Description Preparation Date: **1/9/2025**

File Completion Date: **9/9/2025**

Signature:

Head of Department Name:

Prof. Dr. Thaer Saoud Salman

Date: **4/9/2024**

Signature:

Scientific Associate Name:

Asst. Prof. Dr. Husain Razzaq

Date: **4/9/2024**

The file is checked by: **Asst. Prof. Dr. Haider Majid Hasan**

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: **9/9/2024**

Signature:

Approval of the Dean

Prof. Dr. Ali Nasir Hilo

Date: **9/9/2024**

1. Program Vision

To attain a distinguished position in the field of engineering education and scientific research, by fostering collaboration and innovation, and striving to graduate competent civil engineers who contribute to sustainable development and community service.

2. Program Mission

The mission of the department is to qualify creative civil engineers through modern teaching methods and scientific research, with an awareness of societal challenges and the development of sustainable engineering solutions to address them.

3. Program Objectives

1. Empowering graduates to become competent engineers with comprehensive knowledge of civil engineering.
2. Enabling graduates to acquire the ability to apply design and management methods and to work in construction projects related to civil engineering.
3. Equipping graduates with the ability to develop communication and teamwork skills in multidisciplinary projects.
4. Providing graduates with the capacity for lifelong learning to enhance professional performance, foster creativity, and engage in planning grounded in community values and professional ethics.
5. Keeping pace with the latest developments in civil engineering through periodic reassessment of study plans and proposed curricula.
6. Conducting scientific research and studies to expand knowledge and applications, while offering innovative solutions particularly to local and regional problems.
7. Establishing strong partnerships with local, regional, and international companies and institutions to promote and support scientific research and educational activities at the university.

4. Program Accreditation

We are continuing to work on completing the accreditation file and submitting both the self-assessment report and the review report.

5. Other external influences

Ministry of Higher Education and Scientific Research

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	4	4	4.4%	
College Requirements	–	–	–	
Department Requirements	30	86	95.6%	
Summer Training	1	NA	NA	
Other				

1. Program Description

Structured Hours		Code	Module Name	Level
Lab	Theory			
	4	CE 351	Engineering analysis	Third
	4	CE 352	Structural analysis	
2	3	CE 353	Soil mechanics1	
	4	CE 354	Reinforced concrete1	
2	2	CE 355	Water engineering	
	3	CE 356	Traffic engineering	
	3	CE 357	Projects administration	
1	1	CE 358	Computer applications1	
	4	CE 361	Numerical analysis	
	4	CE 362	Structural analysis2	
2	3	CE 363	Soill mechanics2	
	4	CE 364	Reinforced concrete2	
	3	CE 365	Hydrology	
	3	CE 366	Road designs	
		CE 367	Engineering economy	
1	1	CE 368	Computer applications2	
	3	CE 4338	Foundation engineering	Forth
2	2	CE 4340	Asphalt technology	
	3	CE 4342	Reinforced concrete3	
	3	CE 4344	Steel design1	
	3	CE 4346	Hydrology	
	3	CE 4348	Estimation and standards	
	3	CE 4350	Hydraulic structures1	
	1	CE 4111	Academic english3	
	3	CE 4339	Foundation engineering1	
	3	CE 4341	Pavement engineering	
	3	CE 4343	Reinforced concrete4	

	3	CE 4345	Steel design2	
2	3	CE 4347	Wastewater Treatment	
	2	CE 4349	Construction methods	
	2	CE 4351	Hydraulic structures2	
	1	CE 4352	Academic english3	
	2	CE 4112	Selective topic	
1	1		Capstone project	

8. Expected learning outcomes of the program

Knowledge	
1A	The ability to identify, formulate, and solve engineering problems using the principles of mathematics, science, and engineering
2A	The ability to conduct experiments, analyze data, and interpret results to reach sound engineering conclusions
Skills	
1B	The ability to design engineering systems or components that meet specified needs within realistic constraints
2B	The ability to communicate effectively, both orally and in writing, with diverse audiences
3B	The ability to work effectively in teams and manage projects efficiently in multidisciplinary environments
Ethics	
1C	Understanding ethical and professional responsibilities and the impact of engineering solutions on society and the environment
2C	The ability for continuous self-directed learning and keeping up with scientific and technological developments

9. Teaching and Learning Strategies

1. **1. Theoretical Lectures: Serving as the primary means of delivering fundamental scientific knowledge.**
2. **2. Laboratory and Practical Sessions: To apply theoretical concepts in practice and enhance analytical skills.**
3. **3. Projects and Assignments: Particularly graduation projects and reports, aimed at developing design and innovation skills.**
4. **4. Presentations and Classroom Discussions: To strengthen communication and teamwork skills.**
5. **5. Field Visits: To connect students with real-world engineering practice.**
6. **6. E-Learning / Learning Management Systems (LMS): Through the use of electronic platforms and digital materials.**
7. **.7Self-Learning: Encouraging students to engage in independent research and utilize scientific resources**

10. Evaluation methods

Implemented at all stages of the program in general.
Quizzes
Assignments
Projects / Lab.
Report
Midterm Exam

11. Faculty

Faculty Composition		Specialization		Academic Rank	
PT	FT			General	
	Permanent	Specific Specialization	Major	PhD, MSc, etc	Name
	Permanent	Project management	Civil Engineering	PhD	احسان علي حسين
	Permanent		Civil Engineering	PhD	احمد حميد شهاب
	Permanent	Environment	Civil Engineering	PhD	احمد عادل ناجي
	Permanent	Roads	Civil Engineering	MSc	احمد كاظم كريم
	Permanent	Geotech	Civil Engineering	MSc	اسراء محمد محسن
	Permanent	Geotech	Civil Engineering	PhD	اسعد حافظ حميش
	Permanent	Project management	Civil Engineering	PhD	بروج بشير محمود
	Permanent	Structure	Civil Engineering	PhD	ثائر سعود سلمان
	Permanent	Water resources	Civil Engineering	MSc	جاسم محمدرضا عزيز
	Permanent	Structure	Civil Engineering	MSc	جاسم محمود مهلهل
	Permanent	survey	Civil Engineering	PhD	جرير جابر محمد
	Permanent	Structure	Civil Engineering	MSc	حسام الدين القهار عمار
	Permanent	Geotech	Civil Engineering	PhD	حسن علي عباس
	Permanent	Structure	Civil Engineering	PhD	حسين عسكر جابر
	Permanent	Geotech	Civil Engineering	MSc	حقي هادي عبود

	Permanent	Structure	Civil Engineering	MSc	دانية عبدالناصر عبدالرضا عليوي
	Permanent	Geotech	Civil Engineering	MSc	دعاء طه ياسين
	Permanent	Water resources	Civil Engineering	MSc	رنا عقيل عبيد ياسين
	Permanent	Water resources	Civil Engineering	MSc	زهراء صباح حسن علي
	Permanent	Structure	Civil Engineering	MSc	زهراء علي عبدالحسين
	Permanent	**Materials**	Civil Engineering	MSc	سرى سليم حسن
	Permanent	Roads	Civil Engineering	PhD	سلام رضا عليوي
	Permanent	Geotech	Civil Engineering	PhD	سلمان فاضل شوكة
	Permanent	Geotech	Civil Engineering	MSc	سليم محمود معارك
	Permanent	Environment	Civil Engineering	PhD	صلاح لفتة فرحان
	Permanent	Structure	Civil Engineering	PhD	صلال راشد عبد
	Permanent	Geotech	Civil Engineering	PhD	عامر محسن مهاوش جابر
	Permanent	Water resources	Civil Engineering	MSc	عبدالله سراج أنور
	Permanent	roads	Civil Engineering	MSc	عبدالمهيمن جعفر كاظم
	Permanent	Survey	Civil Engineering	MSc	عقيل عبود عبدالحسن
	Permanent	Project management	Civil Engineering	PhD	علاء خرباط شذر
	Permanent	**Civil Engineering**	Civil Engineering	MSc	علاء محسن حمد
	Permanent	Environment	Civil Engineering	PhD	علي جويد جعيل
	Permanent	Structure	Civil Engineering	MSc	علي حسين احمد
	Permanent	Geophysics	Civil Engineering	PhD	علي عبد موحي
	Permanent	Water resources	Civil Engineering	PhD	علي ناصر حلو
	Permanent	Environment	Civil Engineering	PhD	علي وحيد نغيمش

	Permanent	History	Civil Engineering	MSc	علياء كاظم جبر
	Permanent	Structure	Civil Engineering	PhD	كرار علي فزع
	Permanent	Civil Engineering	Civil Engineering	MSc	لمياء جبار مطر
	Permanent	Water resources	Civil Engineering	PhD	ليث بدر فتحي
	Permanent	Geotech	Civil Engineering	PhD	محمد علي حسين حسن
	Permanent	Building materials	Civil Engineering	MSc	محمد فريح حطاب
	Permanent	Geotech	Civil Engineering	MSc	مرتضى هاشم حسون
	Permanent	Water resources	Civil Engineering	MSc	مروة كريم عزيز
	Permanent	arabic	Civil Engineering	PhD	مشتاق كاظم جمعة
	Permanent	materials	Civil Engineering	MSc	مصطفى ثائر حسن
	Permanent	roads	Civil Engineering	PhD	مقداد منذر عبدالغني
	Permanent	Water resources	Civil Engineering	MSc	منال عبدالستار محمد
	Permanent	Water resources	Civil Engineering	MSc	مهدي نهير راهي
	Permanent	Structure	Civil Engineering	PhD	ميلاد محمدحسن راضي
	Permanent	roads	Civil Engineering	PhD	نبيل سليم سعد
	Permanent	Geotech	Civil Engineering	PhD	نبيل محمدعلي حميد
	Permanent	Water resources	Civil Engineering	MSc	نذير صلاح الدين أيوب
	Permanent	Water resources	Civil Engineering	MSc	نور قاسم صبري
	Permanent	environment	Civil Engineering	PhD	نورالهدى علاءالدين جاسم
	Permanent	Geotech	Civil Engineering	MSc	هبة داود سليم
	Permanent	Water resources	Civil Engineering	MSc	هدى يوسف عناد
	Permanent	chemical Engineering	chemical Engineering	MSc	ولاء عبدالخالق زغير

Professional Development

Mentoring new faculty members

 Orientation Program:

An introductory session upon appointment covering the college mission, program objectives (PEOs), and learning outcomes (GOs).

Explanation of department systems: Outcome-Based Education (OBE), quality assurance, and assessment mechanisms.

 Academic Advising:

Assignment of an experienced faculty member as an academic supervisor/mentor for each new member.

Providing support in lecture preparation, teaching strategies, and classroom management.

 Training in Teaching and Learning Strategies:

Involving new members in workshops on:

Effective teaching methods.

Preparing exams and rubrics for student assessment.

 Research Preparation and Publication:

Workshops on how to write and publish research papers.

 Continuous Professional Development:

An annual plan for each faculty member, including participation in workshops and training courses.

 Administrative Support:

Familiarization with university regulations, rights, and responsibilities.

Professional development of faculty members

 Workshops and Training Courses:

On teaching strategies and active learning.

On the use of e-learning systems (LMS) and distance learning tools.

On preparing rubrics and modern assessment tools.

 Scientific Conferences and Seminars:

Participation in research presentations or attendance at local and international conferences.

Exchange of expertise with other universities.

Participation in external training programs.

 Scientific Research and Publication:

Support for applied research and community-related projects.

Encouragement of publication in reputable scientific journals (Scopus, WoS).

Provision of financial or time support to facilitate research completion.

 Self-Assessment and Feedback:

Student surveys on faculty performance.

Annual performance evaluation.

12. Acceptance Criterion

Central Admission:
According to the Central Admission Guide issued by the Ministry of Higher Education and Scientific Research, along with the Student Affairs Procedures Guide and the regulations and conditions of admission issued by the Ministry of Higher Education and Scientific Research.

Evening Study Program:
According to the Central Admission Guide issued by the Ministry of Higher Education and Scientific Research, along with the Student Affairs Procedures Guide and the regulations and conditions of admission issued by the Ministry of Higher Education and Scientific Research.

13. The most important sources of information about the program

1. The official website of the college/university.
2. Publication on the notice board.
3. Sending via the official email upon request.

14. Program Development Plan

1 .Curriculum and Course Development
2 .Achievement of Learning Outcomes (GOs)
3 .Development of Teaching and Assessment Methods
4 .Capacity Building for Faculty Members
5 .Development of Infrastructure and Laboratories
6 .Strengthening the Relationship with the Labor Market and the Community
7. Continuous Improvement

Program Skills Map										
Program Learning Outcomes										
Values		Skills			Knowledge		Core, supportive or basic	Name	Code	Level
2C	1C	3B	2B	1B	2A	1A				
					★	★	Core	Engineering analysis	CE 351	Third
				★		★	Core	Structural analysis	CE 352	
				★		★	Core	Soil mechanics1	CE 353	
				★		★	Core	Reinforced concrete1	CE 354	
				★		★	Core	Water engineering	CE 355	
				★		★	Core	Traffic engineering	CE 356	
		★	★	★	★	★	Core	Projects administration	CE 357	
			★	★		★	Core	Computer applications1	CE 358	

Program Skills Map										
Program Learning Outcomes										
Values		Skills			Knowledge		Core, supportive or basic	Name	Code	Level
2C	1C	3B	2B	1B	2A	1A				
					★	★	Core	Numerical analysis	CE 361	
				★		★	Core	Structural analysis2	CE 362	
				★		★	Core	Soill mechanics2	CE 363	
				★		★	Core	Reinforced concrete2	CE 364	
				★		★	Core	Hydrology	CE 365	
				★		★	Core	Road designs	CE 366	
				★		★	Core	Engineering economy	CE 367	
			★	★		★	Core	Computer applications2	CE 368	

Program Skills Map										
Program Learning Outcomes										
Values		Skills			Knowledge		Core, supportive or basic	Name	Code	Level
2C	1C	3B	2B	1B	2A	1A				
				★		★	Core	Foundation engineering	CE 4338	Forth
				★		★	Core	Asphalt technology	CE 4340	
				★		★	Core	Reinforced concrete3	CE 4342	
				★		★	Core	Steel design1	CE 4344	
				★		★	Core	Hydrology	CE 4346	
				★		★	Core	Estimation and standards	CE 4348	
				★		★	Core	Hydraulic structures1	CE 4350	
		★	★				Core	Academic english3	CE 4111	

Program Skills Map										
Program Learning Outcomes										
Values		Skills			Knowledge		Core, supportive or basic	Name	Code	Level
2C	1C	3B	2B	1B	2A	1A				
				★		★	Core	Foundation engineering1	CE 4339	
				★		★	Core	Pavement engineering	CE 4341	
				★		★	Core	Reinforced concrete4	CE 4343	
				★		★	Core	Steel design2	CE 4345	
				★		★	Core	Wastewater Treatment	CE 4347	
				★		★	Core	Construction methods	CE 4349	
				★		★	Core	Hydraulic structures2	CE 4351	
		★	★				Core	Academic english3	CE 4352	
				★		★	Core	Selective topic	CE 4112	

First Semester/third stage

Code	*Subject*	Hrs./week			Units
		Theo.	Tut.	Lab.	
CE 3322	Engineering Analysis	3	1	-	3
CE 3324	Theory of Structures (I)	3	1	-	3
CE 3326	Soil Mechanics (I)	2	1	2	3
CE 3328	Reinforced Concrete (I)	3	1	-	3
CE 3330	Projects Management	2	-	-	2
CE 3332	Traffic Engineering	1	1	-	1
CE 3334	*Irrigation & Drainage Engineering*	2	1	-	2
CE 3336	*Computer Applications in Civil Engineering (I)*	*-*	*-*	*2*	*1*
CE 3109	*English for Academic Purposes (I)*	1	-	-	*1*
Total		17	6	4	19
		27			

Weeks	CE 3322 Engineering Analysis			
	Theory	**Tutorial**	**Laboratory**	**Units**
	3hrs./ Week	*1hr. / Week*	**---**	**3**
1	Classification of DE			
2	Solution of 1st order ODE			
3	Applications on 1st order ODE			
4	Solution of Homogenous 2nd order ODE			
5	Solution of Non Homogenous 2nd order ODE			
6	Solution of Linear higher order ODE			
7	Euler – Cauchy equations			
8	Applications on 2nd order ODE			
9	Solution simultaneous linear DE			
10	Applications on Simultaneous linear DE			
11	Fourier Series			
12	Applications on Fourier Series			
13	Partial differential equations			
14	Separation of variables			
15	Applications on Partial differential equations			

Weeks	CE 3324 Theory of Structures (I)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	3hrs./ Week	*1hr. / Week*	**---**	**3**
1	Introduction and types of structures and loads			
2	Determinacy and stability			
3	Determinacy and stability			
4	Analysis of statically determinant frames			
5	Types and Analysis of statically determinant trusses			
6	Analysis of statically determinant Arches and composite structures			
7	Influence line for statically determinant beams and frames			
8	Influence line for statically determinant trusses and composite structures			
9	Influence line for statically determinant floor girders			
10	Maximum influence at a point due to a series of concentrated loads			
11	Maximum influence at a point due to a series of concentrated loads			
12	Deflections by virtual work method: Beams			
13	Deflections by virtual work method: Frames and arches			
14	Deflections by virtual work method: Trusses and composite structures			
15	Deflections of Beams by conjugated-beam method			

Weeks	CE 3326 Soil Mechanics (I)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**2hrs./ Week**	**3**
1	Introduction to Soil Mechanics			
2	Soil properties			
3	Soil properties			
4	Phase diagram			
5	Weight volume relationships			
6	Soil classification			
7	Unified soil classification system			
8	Soil compaction			
9	Soil compaction and density			
10	Stress with in the soil mass			
11	Soil permeability			
12	Permeability of stratified soil layers			
13	Fluid flow with in the soil			
14	One dimensional flow application			
15	Two dimensional flow			

Weeks	CE 3328 Reinforced Concrete (I)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	3hrs./ Week	*1hr. / Week*	**---**	**3**
1	Introduction			
2	Analysis using working stress method			
3	Design using working stress method			
4	Analysis and design of doubly and T-beams using working stress method			
5	Analysis of singly reinforced beams using ultimate strength method			
6	Design of single beams using ultimate strength method			
7	Analysis and design of doubly reinforced beams using ultimate strength method			
8	Analysis and design of T- beams and irregular using ultimate strength method			
9	Shear strength and design of shear reinforcement of concrete beams			
10	Shear strength and design of shear reinforcement of concrete beams			
11	Torsion strength and design of web reinforcement of concrete beams			
12	Torsion strength and design of web reinforcement of concrete beams			
13	Torsion strength and design of web reinforcement of concrete beams			
14	Severability of beams-deflection			
15	Severability of beams-crack width			

Weeks	CE 3330 Projects Management			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	---	**---**	**2**
1	Definition of construction management			
2	Project manager			
3	Engineering responsibility			
4	Project participant			
5	Project elements			
6	Project contracting methods			
7	Contracting types			
8	Contract documents			
9	Planning			
10	Scheduling			
11	Scheduling methods			
12	Bar chart method			
13	Critical network method			
14	Pert methods			
15	Claims			

Weeks	CE 3332 Traffic Engineering			
	Theory	**Tutorial**	**Laboratory**	**Units**
	1hr./ Week	*1hr. / Week*	**---**	**1**
1	Traffic administration			
2	Volume studies			
3	Volume studies			
4	Speed			
5	Speed			
6	Traffic Flow Theory			
7	Traffic Flow Theory			
8	Traffic Flow Theory			
9	Delay Studies			
10	Capacity and Level of Service (LOS)			
11	Capacity and Level of Service (LOS)			
12	Capacity and Level of Service (LOS)			
13	Design of traffic signals			
14	Design of traffic signals			
15	Traffic management to reduce congestion and increase safety			

Weeks	CE 3334 Irrigation & Drainage Engineering			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**---**	**2**
1	Irrigation(definition, purposes, sources)			
2	Soil-water relationship			
3	Flow of water into and through soil			
4	Water requirement, Irrigation efficiencies			
5	Consumptive use, Water duty			
6	Unlined irrigation canal			
7	Unlined irrigation canal			
8	lined irrigation canal			
9	lined irrigation canal			
10	Drainage			
11	Drainage			
12	Planning of irrigation and drainage networks			
13	Planning of irrigation and drainage networks			
14	Methods of field irrigation			
15	Methods of field irrigation			

Weeks	CE 3336 Computer Applications in Civil Engineering (I)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	---	*---*	*2hrs. / Week*	**2**
1	Introduction to AutoCAD(history, viewport and bars, essential commands, Quick access toolbar)			
2	Coordinates input methods with applications			
3	Modify menu and its applications			
4	Draw menu and its applications			
5	Draw menu and its applications			
6	Hash and dimensions of the drawing			
7	Make, insert, edit Block			
8	Modify menu and its applications			
9	Layers and its applications			
10	Structural design presentation			
11	Drawing of foundations			
12	Drawing of reinforced concrete beams and columns			
13	Drawing of reinforced concrete slabs			
14	Drawing of stairs and lifts			
15	Some structural details			

Weeks	CE 3109 English for Academic Purposes (I)			
	Theory	Tutorial	Laboratory	Units
	1hrs./ Week	1hr. / Week	---	1
1	Auxiliary verbs: do , be and have			
2	Question and negatives: Short answers			
3	Simple and continuous, present passive			
4	Past tenses: past simple and continuous			
5	Model verbs: have got, can and be allowed to			
6	Future form, going to and will			
7	Question with like, describing food			
8	Present perfect, phrasal verbs			
9	Conditional, base and strong adjective			
10	Model verb 2, probability, agreeing and disagreeing			
11	Indirect question, informal English			
12	Reported speech and reported requests			
13	Making suggestion, expressing quantity			
14	Reported question, commands			
15	Review			

Second Semester/third stage

Code	*Subject*	Hrs./week			Units
		Theo.	Tut.	Lab.	
CE 3323	*Numerical Analysis*	*2*	*-*	*2*	*3*
CE 3325	*Theory of Structures (II)*	*3*	*1*	*-*	*3*
CE 3327	*Soil Mechanics (II)*	*2*	*1*	*2*	*3*
CE 3329	*Reinforced Concrete (II)*	*3*	*1*	*-*	*3*
CE 3335	Water Engineering	2	1	2	3
CE 3331	*Engineering Economy*	*2*	*-*	*-*	*2*
CE 3333	*Geometric Roads Design*	*1*	*1*	*-*	*1*
CE 3337	*Computer Applications in Civil Engineering (II)*	*-*	*-*	*2*	*1*
CE 3110	*English for Academic Purposes (II)*	1	-	-	*1*
Total		16	5	8	20
		29			

Weeks	CE 3323 Numerical Analysis			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	---	*2hrs. / Week*	**3**
1	Solution of f(x) = 0			
2	Advanced Matrices			
3	Numerical solution of Ax = B			
4	Eigen value problems			
5	Numerical Solution of nonlinear system of equations			
6	Interpolation (reading between numbers)			
7	Numerical Differentiation			
8	Numerical integration			
9	Numerical solution of ODE			
10	Finite Difference			
11	Solution of ODE using finite difference			
12	Numerical solution of PDE			
13	Elliptic PDE			
14	Parabolic PED			
15	Hyperbolic PDE			

Weeks	CE 3325 Theory of Structures (II)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	3hrs./ Week	*1hr. / Week*	**---**	**3**
1	Analysis of statically indeterminate Structures by the force method: Beams			
2	Analysis of statically indeterminate Structures by the force method: frames and arches			
3	Analysis of statically indeterminate Structures by the force method: frames and arches			
4	Analysis of statically indeterminate Structures by the force method: Trusses and composite structures			
5	Analysis of statically indeterminate structures by slope-deflection method			
6	Analysis of statically indeterminate structures by slope-deflection method			
7	Analysis of statically indeterminate structures by slope-deflection method			
8	Analysis of statically indeterminate structures by slope-deflection method			
9	Analysis of statically indeterminate structures by moment distribution method			
10	Analysis of statically indeterminate structures by moment distribution method			
11	Analysis of statically indeterminate structures by moment distribution method			
12	Approximate analysis of statically indeterminate structures			
13	Approximate analysis of statically indeterminate structures			
14	Elective Topics			
15	Elective Topics			

Weeks	CE 3327 Soil Mechanics (II)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	*2hrs. / Week*	**3**
1	Stresses within the soil mass			
2	Total Stresses-effective stress and pure water pressure			
3	Stress due to loads			
4	Stress due to loads			
5	Consolidation			
6	Consolidation settlement			
7	Consolidation settlement			
8	Shear strength			
9	Direct shear			
10	Triaxial shear test			
11	Types of triaxial shear test			
12	Triaxial shear test			
13	Un conslidation drain triaxial (UD)			
14	Consolidation drained triaxial (CD)			
15	Un confined compression test.			

Weeks	CE 3329 Reinforced Concrete (II)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	3hrs./ Week	*1hr. / Week*	**---**	**3**
1	Analysis of one-way slab			
2	Design of one-way slab			
3	Analysis and Design of Continuous Beams and One-Way Slabs			
4	Analysis of two-way slab			
5	Design of two-way slab			
6	Analysis and design of short concrete columns under concentric loads			
7	Analysis and design of short concrete columns under uniaxial eccentric loads			
8	Analysis and design of short concrete columns under biaxial eccentric loads.			
9	Analysis and design of long (slender)concrete columns			
10	Analysis and design of long (slender)concrete columns			
11	Bond, anchorage and development in tension			
12	Bond, anchorage and development in compression			
13	Lap splice in tension and compression			
14	Standard hooks in tension			
15	Termination of tension reinforcement			

Weeks	CE 3335 Water Engineering			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**2hrs./ Week**	**3**
1	Introduction of Sanitary Engineering			
2	Basics of Sanitary and Environmental Engineering			
3	Sources of water, the amount of water and sewage			
4	Surface water, quality of water ,drinking water standards			
5	Water consumption			
6	Pumping design			
7	Water treatment(coagulation)			
8	Water treatment (flocculation)			
9	Water treatment(sedimentation)			
10	Water treatment(sedimentation)			
11	Water treatment(filtration)			
12	Water treatment(disinfection)			
13	Water distribution			
14	Water distribution			
15	Introduction to Advanced Treatments			

Weeks	CE 3331 Engineering Economy			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	**---**	**---**	**2**
1	Concept of engineering economics			
2	Element of costs			
3	Break-even analysis			
4	Interest formulas and their applications			
5	Present worth method of comparison			
6	Present worth method of comparison			
7	Future worth method			
8	Future worth method			
9	Annual equivalent method			
10	Annual equivalent method			
11	Rate of return method			
12	Depreciation			
13	Depreciation			
14	Evaluation of public alternatives			
15	Evaluation of public alternatives			

Weeks	CE 3333 Geometric Roads Design			
	Theory	**Tutorial**	**Laboratory**	**Units**
	1hr./ Week	*1hr. / Week*	**---**	**1**
1	Elements of design			
2	Stopping and passing sight distance			
3	Stopping and passing sight distance			
4	Stopping and passing sight distance			
5	Design of horizontal curves			
6	Design of horizontal curves			
7	Design of horizontal curves			
8	Design of vertical curves			
9	Design of vertical curves			
10	Design of vertical curves			
11	Design of vertical curves			
12	Interchanges			
13	Interchanges			
14	Design of parking			
15	Design of parking			

Weeks	CE 3337 Computer Applications in Civil Engineering (II)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	---	---	**2hrs./ Week**	**2**
1	Introduction to STAADPRO Program			
2	Editor method			
3	Orders used in editor method			
4	Orders used in editor method			
5	Analysis of concrete structures using editor			
6	Analysis of concrete structures using editor			
7	Analysis of steel structures using editor			
8	Analysis of steel structures using editor			
9	Design of concrete structures using editor			
10	Design of concrete structures using editor			
11	Design of steel structures using editor			
12	Design of steel structures using editor			
13	Viewing results of concrete design			
14	Viewing results of steel design			
15	Viewing results of steel design			

Weeks	CE 3110 English for Academic Purposes (II)			
	Theory	Tutorial	Laboratory	Units
	1hrs./ Week	1hr. / Week	---	1
1	Compound noun, phrasal verbs.			
2	Exchanging information about major life.			
3	Literal or idiomatic, on the phone.			
4	Time clauses, second conditional.			
5	Discussion what would you do.			
6	Discussion custom connected with marriage.			
7	Birth, marriage and death.			
8	Grammar reference.			
9	Pair work, irregular verbs.			
10	Verb patterns, phonetic symbols.			
11	Talking about rules and regulations.			
12	Discussion your idea holiday.			
13	Talking about popular food and popular places.			
14	Guide to good manners.			
15	Review			

Fourth Year/ First semester

Code	*Subject*	*Hrs./week*			*Units*
		Theo.	*Tut.*	*Lab.*	
CE 4338	*Foundations Engineering (I)*	*2*	*1*	*-*	*2*
CE 4340	*Asphalt Technology*	*2*	*-*	*2*	*3*
CE 4342	*Reinforced Concrete (III)*	*2*	*1*	*-*	*2*
CE 4344	*Steel Structures (I)*	*2*	*1*	*-*	*2*
CE 4346	*Hydrology*	*2*	*1*	*-*	*2*
CE 4348	*Estimation & Specifications*	*2*	*-*	*-*	*2*
CE 4350	*Hydraulic Structures (I)*	2	1	-	2
CE 4111	*English for Academic Purposes (III)*	1	-	-	*1*
Total		*15*	*5*	*2*	*16*
		22			

No. of Weeks	CE 4353 Engineering Project (1-Year)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	1hr. / Week	---	*2hrs. / Week*	**4**
30	Students are required to work on project in any of the areas related to Civil Engineering. The students will work 3 hrs. per week with his / her supervisor(s) during the all-academic year in the 4th stage.			

Weeks	CE 4338 Foundations Engineering (I)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**---**	**2**
1	Introduction to Site Investigation			
2	Geotechnical and Physical Site Investigation and In Situ tests			
3	Lateral Earth pressure			
4	Rankine Theory (Plastic Equilibrium)			
5	Coulomb Theory (Plastic Equilibrium)			
6	Active and Passive state			
7	Retaining Walls and its Design			
8	Sheet Piles and Anchors			
9	Slope Stability Analysis			
10	Method of Slope Stability Analysis			
11	Finite and Infinite Slope			
12	Bearing Capacity Theory			
13	Bearing Capacity in Shallow Foundation			
14	Soil Bearing Capacity in Situ (Load test)			
15	Soil Bearing Capacity in Situ (Standard and Cone Penetration Test, SPT and CPT)			

Weeks	CE 4340 Asphalt Technology			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	**---**	**2hrs./ Week**	**3**
1	Cross-Section Elements and Mass Haul Diagram			
2	Cross-Section Elements and Mass Haul Diagram			
3	Cross-Section Elements and Mass Haul Diagram			
4	Types and properties of asphalt in pavement construction			
5	Types and properties of asphalt in pavement construction			
6	Types and properties of asphalt in pavement construction			
7	Aggregate used in Asphalt Concrete			
8	Aggregate used in Asphalt Concrete			
9	Aggregate used in Asphalt Concrete			
10	Requirements for bituminous mixes			
11	Volumetric Properties of Asphalt Mixtures			
12	Volumetric Properties of Asphalt Mixtures			
13	Design of aggregate gradation for asphalt mixes			
14	Design of asphalt mixes			
15	Design of asphalt mixes			

Weeks	CE 4342 Reinforced Concrete (III)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**---**	**2**
1	Review for concrete design members and types of loads			
2	Types of two way slab systems			
3	Design of two way slab by Direct Design Method			
4	Design of two way slab by Direct Design Method			
5	Design of two way slab by Direct Design Method			
6	Design of two way slab by Direct Design Method			
7	Design of punching shear in flat slab			
8	Design of punching shear in flat slab			
9	Design of punching shear in flat slab			
10	Design of punching shear in flat slab			
11	Design of two way slab by Equivalent frame method			
12	Design of two way slab by Equivalent frame method			
13	Design of two way slab by Equivalent frame method			
14	Design of two way slab by Equivalent frame method			
15	Design of two way slab by Equivalent frame method			

Weeks	CE 4344 Steel Structures (I)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**---**	**2**
1	Introduction of steel structures			
2	Types of loadings			
3	Design of tension members			
4	Design of tension members			
5	Design of compression members (columns)			
6	Design of compression members (columns)			
7	Design of compression members (columns)			
8	Design of flexural members (beams)			
9	Design of flexural members (beams)			
10	Design of flexural members (beams)			
11	Design of flexural members (beams)			
12	Design of beam - column members			
13	Design of beam - column members			
14	Design of beam - column members			
15	Design of beam - column members			

Weeks	CE 4348 Hydrology			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**---**	**2**
1	Hydrology, hydrologic cycle, Meteorological data			
2	Precipitation, Rainfall information			
3	Estimating missing precipitation data, Double mass curve analysis			
4	Average precipitation over an area			
5	Evaporation and transpiration, Infiltration			
6	Stream flow			
7	Extension of rating curve			
8	Hydrograph			
9	Hydrograph			
10	Reservoir routing			
11	Stream flow routing			
12	Groundwater			
13	Well hydraulics			
14	Well hydraulics			
15	Flood Probability			

Weeks	CE 4348 Estimation & Specifications			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	---	---	**2**
1	Introduction about estimating and earth works with planning and leveling.			
2	Excavation of foundation			
3	Layer of sub-base			
4	Casting lean with width equal to the foundation			
5	layer of block or rock			
6	layer of block or rock			
7	Wall building work - Build by brick and cement mortar and by block			
8	Casting a concrete for girders and column s			
9	Casting a concrete to the slabs.			
10	Finishing works			
11	Roof works estimating			
12	Box Culvert estimating			
13	Water Tank estimating			
14	Cost Preparing			
15	Cost Preparing			

Weeks	CE 4350 Hydraulic Structures (I)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	**1hr./ Week**	**---**	**2**
1	Hydraulic structures (introduction)			
2	Seepage under hydraulic structures			
3	Seepage under hydraulic structures			
4	Seepage under hydraulic structures			
5	Design of diversion structures			
6	Design of head Regulators			
7	Design of head Regulators			
8	Design of head Regulators			
9	Design of cross Regulators			
10	Design of weir and Gates			
11	Design of weir and Gates			
12	Design of Box Culverts			
13	Design of Box Culverts			
14	Design of Inverted Siphon			
14	Design of Inverted Siphon			
15	Design of Transition in open channels			

Fourth year/ Second Semester

Code	*Subject*	Hrs./week			Units
		Theo.	Tut.	Lab.	
CE 4339	Foundations Engineering (II)	2	1	-	2
CE 4341	Pavement Design	2	1	-	2
CE 4343	Reinforced Concrete (IV)	2	1	-	2
CE 4345	Steel Structures (II)	2	1	-	2
CE 4347	*Wastewater Treatment*	*2*	*1*	*2*	*3*
CE 4349	Construction Methods	2	-	-	2
CE 4351	*Hydraulic Structures (II)*	*2*	*1*	*-*	*2*
CE 4352	*Elective Topics in Structural Engineering*	*1*	*1*	*-*	*1*
CE 4112	*English for Academic Purposes (IV)*	1	-	-	*1*
Total		16	7	2	17
		25			

Weeks	CE 4339 Foundations Engineering (II)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**---**	**2**
1	Settlement and Consolidation Theory			
2	Settlement in Layered Soils			
3	Stress Distribution due to Structural Load			
4	Consolidation Settlement			
5	Preliminarily Settlement			
6	Structural Design of Foundations			
7	Structural Design of Spread Footing			
8	Non eccentricity of Rigid Footing (Design and Analysis)			
9	Structural Design of Combined Footing			
10	Mat or Raft Foundation design			
11	Design of piles Cap			
12	Axially and Laterally loaded Piles Foundation design			
13	Board and Driven Pile's Design in Cohessionless and Cohesive Soils			
14	Bearing Capacity of Single Pile in Sand and Clay			
15	In Situ Pile Load test and settlement of Pile cap			

Weeks	CE 4341 Pavement Design			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr./ Week*	**---**	**2**
1	Types of pavements and general principles			
2	Types of pavements and general principles			
3	Stresses in flexible pavement			
4	Stresses in flexible pavement			
5	Design of Flexible Pavement			
6	Design of Flexible Pavement			
7	Design of Flexible Pavement			
8	Thickness design of rigid Pavement			
9	Thickness design of rigid Pavement			
10	Types of joints in rigid pavement			
11	Stresses in rigid pavement			
12	Stresses in rigid pavement			
13	Reinforcement design of rigid pavement			
14	Reinforcement design of rigid pavement			
15	Reinforcement design of rigid pavement			

Weeks	CE 4343 Reinforced Concrete (IV)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**---**	**2**
1	Introduction to yield line theory			
2	Analysis of slab by yield line theory			
3	Analysis of slab by yield line theory			
4	Analysis of slab by yield line theory			
5	Analysis of slab by yield line theory			
6	Design of slab by yield line theory			
7	Design of slab by yield line theory			
8	Introduction to perstressed concrete members			
9	Stresses in perstressed concrete beams			
10	Stresses in perstressed concrete beams			
11	Allowable stresses in perstressed concrete and steel			
12	Design of prestressed beam (ASD method)			
13	Design of prestressed beam (ASD method)			
14	Design of prestressed beam (Ultimate method)			
15	Shear in prestressed beams			

Weeks	CE 4345 Steel Structures (II)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**---**	**2**
1	Design of bolted connections			
2	Design of bolted connections			
3	Design of bolted connections			
4	Design of bolted connections			
5	Design of welded connections			
6	Design of welded connections			
7	Design of welded connections			
8	Design of welded connections			
9	Design of plate girders			
10	Design of plate girders			
11	Design of plate girders			
12	Miscellaneous design considerations			
13	Miscellaneous design considerations			
14	Miscellaneous design considerations			
15	Miscellaneous design considerations			

Weeks	CE 4347 Wastewater Treatment			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	*1hr. / Week*	**2hrs./ Week**	**3**
1	Sewerage system			
2	Quality of waste water			
3	Sewer hydraulic			
4	Waste water treatment objective			
5	Types and method of waste water treatment			
6	Primary treatment			
7	Biological treatment(activated sludge)			
8	Biological treatment, Fixed growth			
9	Clarification, Filtration			
10	Disinfection			
11	Trickling filter			
14	Sludge treatment			
15	Advanced treatment			

Weeks	CE 4349 Construction Methods			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	---	---	**2**
1	Project Pricing and estimating			
2	Project Pricing and estimating			
3	Project Pricing and estimating			
4	Introduction to The Methods of construction			
5	Costs of operation equipment			
6	Costs of operation equipment with examples			
7	Engineering fundamentals for choosing construction tools			
8	Engineering fundamentals for choosing construction tools			
9	Methods of estimating The productivity of machines			
10	Methods of estimating The productivity of machines			
11	Methods of estimating The productivity of machines			
12	Methods of estimating The productivity of machines and costs			
13	Machines Depreciation			
14	Machines Depreciation			
15	Machines Depreciation			

Weeks	CE 4351 Hydraulic Structures (II)			
	Theory	**Tutorial**	**Laboratory**	**Units**
	2hrs./ Week	**1hr./ Week**	**---**	**2**
1	Design of Stilling Basins			
2	Design of Stilling Basins			
3	Design of Barrages			
4	Design of Barrages			
5	Design Drop structure			
6	Design Drop structure			
7	Design Chutes structure			
8	Design Chutes structure			
9	Design Under ground storage introduction			
10	Design Under ground storage flexible base			
11	Design Under ground storage flexible base			
12	Design Under ground storage flexible base			
13	Application of software in hydraulic structures			
14	Application of software in hydraulic structures			
14	Application of software in hydraulic structures			
15	Application of software in hydraulic structures			

Weeks	CE 4352 Elective Topics in Structural Engineering			
	Theory	**Tutorial**	**Laboratory**	**Units**
	1hr./ Week	**1hr./ Week**	**---**	**1**
1	Review on stiffness matrix			
2	Matrix and solutions			
3	Matrix and solutions			
4	Two dimensional stiffness matrix of truss in local and global coordinates			
5	Two dimensional stiffness matrix of truss in local and global coordinates			
6	Analysis of plan trusses using S.M.M			
7	Analysis of plan trusses using S.M.M			
8	Two dimensional stiffness matrix of Beams in local and global coordinates			
9	Two dimensional stiffness matrix of Beams in local and global coordinates			
10	Analysis of plan beams using S.M.M			
11	Analysis of plan beams using S.M.M			
12	Two dimensional stiffness matrix of frame element in local and global coordinates			
13	Two dimensional stiffness matrix of frame element in local and global coordinates			
14	Analysis of plan frames using S.M.M			
15	Analysis of plan frames using S.M.M			