Program Specification

For

Diploma Degree

in

Civil Engineering

(Construction Project Management)

2019-2020

Program Specification

For
Diploma Degree in
Civil Engineering
(Construction Project Management)

A- Basic Information

1- Program title: Civil Engineering.

2- Program type: **Single** ☒ **Double** ☐ **Multiple** ☐

3- Department (s): Civil Engineering
4- Assistance Coordinator: Dr. Ahmed Turk
5- Coordinator: Prof. Dr. Mamdouh Saleh
6- External evaluator(s): Prof. Dr. Hassan I. Muhammad
7- Last date of program specifications approval: Bylaw 2000.

B- Professional Information

1- Program aims:

Civil Engineering is constantly widening its scope in every field of engineering. The prime work of the Civil engineer is to design, fabricate, produce, test and supervise the manufacturing of civil engineering different elements that suits the various industries. The program is devided into three main branches, namely, Structural Engineering branch, Irrigation and Hydraulic Engineering branch, and Public Works branch. This postgraduate diploma program in Civil Engineering transforms graduate engineers to high-quality technical professionals scholars who can meet the requisite requirement of R&D organizations and business industry. The Structure Engineering program is focused in emerging fields of analysis and design. Also, it was designed to cover the fields of Numerical analysis in structural engineering, Theories of elasticity and plasticity, stress and strain analysis, design of high rise buildings, construction materials, soil mechanics, productivity in the construction engineering, statistics in structural engineeing, and computing knowledge required to acquire this advanced knowledge. For the Irrigation and Hydraulic Engineering program, the program is focused in computer application in hydraulic engineering, water resources, flow and contaminants transportation, water waves and wave theory, sediments motion, and design of breakwater systems. The public work engineering program is focused in transportation engineering, design of roadways, computer application in transportation systems, and advanced domestic waste water treatment. In general, this diploma program is to produce a well-rounded and well-balanced graduate who can use Civil Engineering tools in different branches to solve real world problems.

2- Graduate Attributes :

After completing the program the graduate would able to be:

A. Application of the acquired specialized knowledge in his/her professional practice.
B. Identifying professional problems and proposing solutions.
C. Mastering professional skills and the use of appropriate technological means in his/her professional practice.
D. Communication and leadership of a team work throughout systematic professional act.
E. Decision making in the light of available information.
F. Employment of available resources efficiently.
G. Awareness of his/her role in the development of society and the preservation of the environment.
H. Act reflects commitment to integrity and credibility of the profession.
I. Awareness of the need to develop him/her self and to engage in continuous learning.

3- Intended Learning Outcomes (ILOs) for the whole program

Civil Engineering Diploma Program is designed to achieve the above objectives through the following Intended **Learning Outcomes (ILOs)**:

A. Knowledge and understanding			
NAQAAE Academic Reference Standards (ARS)	**ILOs**	**Graduate Attributes**	**Courses Covering such ILOs (by code)**
A1. Theories, basics and specialized knowledge in the field of learning, as well as the subjects that affect his/her professional practice. **النظريات و الأساسيات المتعلقة بمجال التعلم وكذا في المجالات ذات العلاقة**	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of **Structural Engineering**.	A, C	CES501, CES506, CES507, CES511, CES512, CES529, CES532, CES534
	a1-2 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of **Irrigation and hydraulic Engineering**.		CES519, CES527
	a1-3 Demonstrate sufficient		CES526, CES531,

	essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of **Public Work Engineering**.		CES532, , CES528
	a1-4 Exhibit ability to indetail, creatively, with a high level of clarity and authority, using scientific scrutiny and adequate tools identify, explain, and assess issues pertinent to a Diploma Project in the research field, within which the project is placed.	A, B, C, D, E, F	
A2- Fundamentals of ethical & legal professional practice in the field of specialization. **المبادئ الأخلاقية و القانونية للممارسة المهنية في مجال التخصص**	a2-1 Recognize ethnical and professional responsibility issues arising in the practice of the engineering profession.	H	, CES506, CES512
A3- Basics and principles of quality in professional practice in the field of specialization. **مبادئ و أساسيات الجودة في الممارسة المهنية في مجال التخصص**	a3-1 Explain Quality Assurance concepts of different civil engineering disciplins and systems development phases.	C,E,F	, CES506, CES511, CES512, CES519, CES527, CES529, CES533
A4- Mutual relation between professional aspects of professional practice and its effects on the Environment. **التأثير المتبادل بين الممارسة المهنية وانعكاسها علي البيئة**	a4-1 Discuss the effects of civil engineering technologies on the surrounding environment.	G	, CES529
B. Intellectual skills			
B1- Define and analyze problems in the field of specialization and sorting them according to priorities. **تحديد وتحليل المشاكل في مجال التخصص وترتيبها وفقا لأولوياتها.**	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.	A	, CES506,CES507, CES512, CES519, CES527, CES531, CES534, , CES511
	b1-2 Interpret, analyze, and evaluate a given system specific information and relate it to the design of the required system.		, CES512
B2- Solve specialized problems in the field of practice.. **حل المشاكل المتخصصة في مجال مهنته**	b2-1 Apply broad knowledge of modern computational methods and think critically to solve unstructured problems (with incomplete data) related to civil engineering.	A,B	, CES506, CES526, CES528, CES530, CES532, CES533,
B3- Analytically read researches and subjects relevant to the field of specialization. **الربط بين المعارف المختلفة لحل المشاكل المهنية**	b3-1 Analyze, interpret and manipulate data from a variety of sources and researches.	A,B,E,F	, CES506, CES512, CES519, CES529, CES530, CES533
	b3-2 Perform applied research on industrial and societal concerns related to civil engineering field (Project).		, CES512, CES526, CES528
	b3-3 Perform applied research on industrial and societal concerns problems related to civil		

	engineering field (Project).		
B4- Risk assessment in the professional practices. **تقييم المخاطر في الممارسات المهنية**	b4-1 Evaluate pros and cons of given methodologies for civil engineering systems development.	G, H	
B5- Take professional decisions in the light of available information. **اتخاذ القرارات المهنية في سياقات مهنية متنوعة**	b5-1 Acquire decision making capabilities in different situation when facing problems related to analysis, design and development of civil engineering systems.	E	
C. Professional and practical skills			
C1- Apply professional skills in the field of specialization. **تطبيق المهارات المهنية في مجال التخصص. الأساسية و الحديثة في مجال التخصص**	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.	A, B, C	, CES506, CES507, CES511, CES512, CES519, CES527, CES529, CES533, CES534
C2- Write professional reports. **كتابة التقارير المهنية**	c.2-1 Write and evaluate a professional report on specialized systems related to civil engineering technical matters.	I	, CES506, CES529, CES531, CES532
D. General and transferrable skills			
D1- Communicate effectively using all methods. التواصل الفعال بأنواعه المختلفة	d1-1 Express professional and communication skills to innovate and to interact with the scientific community, research team and technocrats involved in multinational companies at global level in the related fields to civil engineering.	D	, CES506,
D2- Use information technology to improve his/her professional practice. **استخدام تكنولوجيا المعلومات بما يخدم الممارسة المهنية**	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems.	C, F, I	, CES506, CES507, CES512, CES519, CES526, CES527, CES528, CES529, CES531, CES533, CES534
	d2-2 Employ the information technology skills to serve his / her career development.		
D3- Apply self evaluation and define personal educational needs. **التقييم الذاتي وتحديد احتياجاته التعلمية الشخصية**	d3-1 Apply self evaluation and specify his educational needs related to civil engineering aspects.	I	
D4- Use different resources to obtain knowledge and information. **استخدام المصادر المختلفة للحصول على المعلومات و المعارف**	d4-1 Use different resources of information like libraries, internet access facilities, etc. to upgrade and enhance their conceptual knowledge.	I	, CES511, CES529
D5- Work in a team and apply time management.	d5-1 Practicing team work in specified professional jobs.	D,F	, CES506, CES512

العمل في فريق ، وإدارة الوقت	d5-2 Manage the time use in a perfect way.		
D6- Lead teams in familiar professional context	d6-1 Lead a team work in specified familiar professional jobs.	D	, CES532
D7- Learn independently and seek continuous learning. **التعلم الذاتي و المستمر**	d7-1 Express a strong foundation of continuous learning so they can maintain their technical competency.	I	, CES529
	d7-2 Seek continuous learning through continuous education, organizing and participating in seminars, workshops, national and international conferences.		

4- Program Academic Reference Standards (ARS)

The external references for standards considered in the development of this program were the Academic Reference Standards (ARS) for postgraduate programs prepared by the National Authority for Quality Assurance and Accreditation (NAQAAE) on 2009. These standards set out the attributes and academic characteristics that are expected to be achieved by the end of the program.

5- Program Structure and Contents:

5.1 Program Duration: 2 years

5.2 Program Structure:

Awarding a Diploma Degree in Civil Engineering Sciences required the study of courses amounting to 18 hours weekly for one academic year. 9 hours of them are devoted to department basic requirements. The other 9 hours constitute specialized courses are selected by the supervision team and approved by the department council. These courses are chosen from among the 500 – level and are directly related to the topic of his research. Also, required for awarding the Diploma Degree in Civil Engineering Sciences is the execution of scientific research that terminated by writing a Project report containing the research results and its complete analysis and defending it successfully.

5.3 Program Contents (Courses):

- **Civil Engineering (Construction Project Management):**

Course Code	Course Title	Course Hrs/Week	Total Marks
CES 501	Statistics in structural engineering	3	100
CES 506	Properties and testing of materials	3	100
CES 507	Quality control and quality assurance	3	100
CES 511	Site investigation and soil testing	3	100
CES 512	Ground improvment	3	100
CES 519	Fabrication, erection and maintenance of steel structures	3	100
CES 526	Methods of Repair and Strengthening of Concrete Structures	3	100
CES 527	General Management in Construction Projects.	3	100
CES 528	Projects Planning and Control	3	100
CES 529	Construction Economics	3	100
CES 530	Construction Equipment	3	100
CES 531	Bids and Contracts.	3	100
CES 532	Resources Management	3	100
CES 533	Productivity in the Construction Projects	3	100
CES 534	Accounting and Costing	3	100
CES P98	Project	3	100

6- Evaluation of program intended learning outcomes:

- Written examinations for the preparatory year after 30 weeks.
- An examiners committee is approved by the faculty council (including at least one external examiner). The evaluation of the Project report and the discussion is carried out in an open session.

7- Program Matrix:

The following table explains the ILO's (of the current program) – Course (main ILOs) matrix.

Program Matrix: ILO's (of the current program) – Course (main ILOs) matrix.

		ILOs																						
		a1-1	a1-2	a1-3	a1-4	a2-1	a3-1	a4-1	b1-1	b1-2	b2-1	b3-1	b3-2	b4-1	b5-1	c1-1	c2-1	d1-1	d2-1	d2-2	d3-1	d4-1	d5-1	d6-1	d7-1
CES	501	X																							
	506	X				X	X		X		X	X				X	X	X	X				X		
	507	X							X							X			X						
	511	X					X		X							X						X			
	512	X				X	X		X	X		X	X			X			X				X		
	519		X				X		X			X				X			X						
	526			X							X		X						X						
	527		X				X		X							X			X						
	528			X							X		X						X						
	529	X					X	X				X				X	X		X			X			X
	530										X	X							X						
	531			X					X								X		X						
	532	X		X							X						X							X	
	533						X				X	X				X			X						
	534	X							X							X			X						
CES P98					X			X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X

- ***Program Coordination Committee:***

Programme coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Saleh**

Courses Specification

For

Diploma Degree

in

Civil Engineering

(Construction Project Management)

Course Specification

Program on which the course is given	M.Sc. and Diploma in Civil Engineering.
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Physics and Mathematical Engineering
Academic year/Level	M.Sc. and Diploma 2019/2020
Date of specification approval	2019

A- Basic Information

Course Title: Statistics in Structural Engineering	**Lecture:** 2 hours
Course Code : CES 501	**Tutorial/ Laboratory:** 1 hour
Bylaw 2000	Total: 3 hours

B- Professional Information

1- Course Aims:

This course aims to equip the student with the essential knowledge and stimulate intuitive understanding of some basic concepts and methods of Statistics.

By the end of the course the students will be able to:

1. Apply the basics and the methodologies of Statistics and to use its different tools
2. Combine some applications of the statistical knowledge with relevant knowledge in the professional practice.
3. Recognize an appropriate range of statistical professional skills and the use of appropriate technology tools to serve professional application.

2- Intended Learning Outcomes (ILOs):

NAQAAE Academic Reference Standards (ARS)	Program ILOs	Course ILOs
A. Knowledge and understanding		
A1- Theories, basics and specialized knowledge in the field of learning, as well as the subjects that affect his/her professional practice.	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in Statistics.	a1-1-1 Compute the **mean**, **median**, **mode**, and **midrange** for a given set of data, and distinguish among them. a1-1-2 Compute the **range**, and **standard deviation** for a given set of data, and distinguish between them. a1-1-3 Find the **percentile** and **quartile** of a single datum in a given set of data. a1-1-4 Construct a **vertical bar graph**, a **horizontal bar graph**, a **comparative bar graph**, a **pictogram**, and a **circle graph** from a given set of data. a1-1-5 Construct a **frequency distribution table**, and **histogram**, or **frequency polygon** from a given set of data. a1-1-6 Determine what percentage of **normally distributed data**, is within a given number of **standard deviations** from the mean.

3- Course Contents:

No.	*Topic*	*Total hours*	*Lec. hours*	*Tut. Hours*
1	The **mean** and **median** for a given set of data.	10	8	2
2	The **mode** and **midrange** for a given set of data.	10	8	2
3	The **range**, and **standard deviation** for a given set of data.	10	8	2
4	The **percentile** and **quartile** of a single datum in a given set of data.	10	6	4
5	A **vertical bar graph**, a **horizontal bar graph** and a **comparative bar graph** for a given set of data.	10	6	4
6	A **pictogram**, and a **circle graph** for a given set of data.	12	8	4
7	The **frequency distribution table**, and **histogram**, or **frequency polygon** for a given set of data.	10	6	4
8	Determine what percentage of normally **distributed data**, is within a given number of **standard deviations** from the mean.	12	8	4
Total		84	56	28

4- Relationship between the course and the Program

Fields	Knowledge & Understanding
Program Academic Standards that the course contribute in achieving	A1 (a1-1)

5- Course Subject Area:

A	**B**	**C**	**D**	**E**	**F**	**G**	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
	100%						100%

6- Course Topics.

Topic No.	*Topic*	*weeks*
1	The **mean** and **median** for a given set of data.	1-4
2	The **mode** and **midrange** for a given set of data.	5-7
3	The **range**, and **standard deviation** for a given set of data.	8-11
4	The **percentile** and **quartile** of a single datum in a given set of data.	12-14
5	A **vertical bar graph**, a **horizontal bar graph** and a **comparative bar graph** for a given set of data.	15-17
6	A **pictogram**, and a **circle graph** for a given set of data.	18-21
7	The **frequency distribution table**, and **histogram**, or **frequency polygon** for a given set of data.	22-25
8	Determine what percentage of **normally distributed data**, is within a given number of **standard deviations** from the mean.	26-29

7- ILOs Matrix Topics

Course (ILOs)	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**7th**	**8th**
a1-1-1 Compute the **mean**, **median**, **mode**, and **midrange** for a given set of data, and distinguish among them.	**X**	**X**						
a1-1-2 Compute the **range**, and **standard deviation** for a given set of data, and distinguish between them.			**X**					
a1-1-3 Find the **percentile** and **quartile** of a single datum in a given set of data.				**X**				
a1-1-4 Construct a **vertical bar graph**, a **horizontal bar graph**, a **comparative bar graph**, a **pictogram**, and a **circle graph** from a given set of data.					**X**	**X**		
a1-1-5 Construct a **frequency distribution table**, and **histogram**, or **frequency polygon** from a given set of data.							**X**	

a1-1-6 Determine what percentage of **normally distributed data**, is within a given number of **standard deviations** from the mean.									**X**

8- Teaching and Learning Method:

Course Intended learning outcomes (ILOs)		Teaching and Learning Method											
		Lecture	Presentation and Movies	Discussion	Tutorial	Problem solving	Brain storming	Projects	Report	Self learning	Cooperative	Discovering	Computer Simulation	Practical Experiments
Knowledge & understanding	a1-1-1	X		X	X	X								
	a1-1-2	X		X	X	X								
	a1-1-3	X		X	X	X								
	a1-1-4	X	X	X	X	X								
	a1-1-5	X		X	X	X								
	a1-1-6	X	X	X	X	X								

9- Assessment

9.1 Assessment Methods

Final Written Examination : to assess students' knowledge, understanding, analysis, creativity, problem solving, and problem identification.

9.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	Week
Final Examination	100	32nd
Total	100%	

10- Facilities required for teaching and learning

Whiteboard – Class Room Equipped with Computer and Video Projector - Library.

A. Library Usage:

Students are encouraged to use library technical resources in the studying of the course.

11- List of references:

An Introduction to Statistical Methods and Data Analysis, Lyman Ott, PWS-KENT Publishing Company, Boston, 1988.

Course coordinator: Dr/ Hewayda El Ghawalby

Program coordinator: Dr. Ahmed Turk

Head of the Department: Prof .Dr. Mamdouh Salah

Date: 8 / 2019

Quality Assurance & Accreditation Unit

Course Specifications

Program on which the course is given : Civil Engineering Dept.
Major or minor element of Program : Major
Department offering the Program : Civil Engineering Dept.
Department offering the course : Civil Engineering Dept.
Academic year / Level : 2019/2020 For M. Sc. Or Diploma
Date of specification approval : Dept. Council 5/8/2018

A-Basic Information

Title: Computer Analysis of Structures **Code**: CES505
Credit Hours: N.A. **Lecture**: 2 hours/week
Tutorial: 1 hours/week **Practical**: None **Total**: 3 hours/week

B- Professional Information

1- Overall aims of the course:

By the end of the course the post graduate student will be able to have a good knowledge about computer analysis of structures, programming, programs for internal forces of beams and columns. Also he will know good knowledge about normal stresses, shear stresses, and principal stresses on beams and columns using computer analysis.

2- Intended learning outcomes of course (ILOs)

NAQAAE Academic Reference Standards (ARS)	Program ILOs	Course ILOs
A. Knowledge and understanding		

A1. Theories, basics and specialized knowledge in the field of learning, as well as other related subjects.	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Structural Engineering.	a1-1-1 Recognize the main engineering software concepts. a1-1-2 Recognize the main computer methods used in solving structural problems. a1-1-3 Understand source of errors in computations during analysis.
B. Intellectual skills		
B1- Analyze and evaluate information in the field of specialization and relate it to solve problems and formulate theories.	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.	b1-1-1 Analyze, interpret and manipulate data from a variety of sources and relate it to solve computational problems related to civil engineering.
B2- Solve specialized problems with available givens and parameters.	b2-1 Apply broad knowledge of modern computational methods and think critically to solve unstructured problems (with incomplete data) related to civil engineering.	b2-1-1 Apply interpolation or curve-fitting methods to deduce exact or approximate formulas that express a mathematical model or relationship.
C. Professional and practical skills		
C1- Mastering the basics as well as the latest professional skills in the field of specialization.	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.	c1-1-1 Select the suitable civil engineering software for a specific problem. c1-1-2 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions using modern computer software related to civil engineering.
D. General and transferrable skills		
D2- Use information technology to improve his/her professional practice	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems.	d2-1-1 Use state-of-the-art computer aided design tools for solving professional problems related civil engineering.
	d2-2 Employ the information technology skills to serve his / her career development.	d2-2-1 Employ the information technology skills to serve his / her career development.
D5- Use different resources to obtain knowledge and information.	d5-1 Use different resources of information like libraries, internet access facilities, etc.	d5-1-1 Use different sources of information like library, internet access facilities, etc. to upgrade and enhance

	to upgrade and enhance their conceptual knowledge.	their conceptual knowledge about up-to-date software in civil engineering.

b- Intellectual skills

b1- Ability to analyze different structural problems.
b2- Ability to know different computer programming for structural analysis.
B3- Recognize the useful uses of computer for structural analysis

c- Professional and practical skills

c1-Determining the different types of computer programs for structural analysis
c2-Applying the computer programs for structural analysis solving
c3- Design of computer programs to solve some special structural cases

d- General and transferable skills

d1- Providing the skills of matching practical problems with theoretical ones in the structural analysis.
d2- Ability to work in a team.
d3- Ability to recognize the safety requirements.
d4- Ability to deal with others according to the rules of professional ethics.

3- Contents

Topic	Lecture	Tutorial/Practical	Total
Introduction to computer languages	4	2	6
Introduction to computer languages programming	4	2	6
Programs for internal forces and deflection of beams	6	3	9
Programs for properties of sections	6	3	9
Programs for normal stresses	8	4	12
Programs for shear stresses	8	4	12
Programs for principal stresses	8	4	12
Programs for interaction diagrams	8	4	12
Programs for slender columns	8	4	12
TOTAL	**60**	**30**	**90**

4- Course Contents

Lecture Topic	Total Hours	Lec. Hours	Tut. Hours	ILOs covered (By No.)
1- Introduction to principals of engineering software.	6	4	2	a1-1-1 & d5-1-1
2- Commercial engineering software.	6	4	2	a1-1-1, c1-1-1,

				d2-1-1, d2-2-1 & d5-1-1
3- Introduction to Visual Basic for Applications.	18	12	6	a1-1-2, c1-1-2 & d2-1-1
4- Applications on matrix algebra.	6	4	2	a1-1-2 & b1-1-1
5- Applications to numerical integration.	6	4	2	a1-1-2 & b1-1-1
6- Roots of equations.	6	4	2	a1-1-2 & b1-1-1
7- Solution of system of linear equations.	12	8	4	a1-1-2 & b1-1-1
8- Interpolation.	6	4	2	a1-1-2 & b2-1-1
9- Curve fitting and least-squares.	6	4	2	a1-1-2 & b2-1-1
10- Solution of system of nonlinear equations.	6	4	2	a1-1-2 & b2-1-1
11- Sources of errors in computations.	6	4	2	a1-1-3
Total	**84**	**56**	**28**	**---**

5- Relationship between the course and the program

Field	Academic Reference Standard (ARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contributes in achieving.	A1 (a1-1)	B1 (b1-1), B2 (b2-1)	C1 (c1-1)	D2 (d2-1, d2-2), D5(d5-1)

6- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering and Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
---	20%	10%	10%	60%	---	---	100%

Course coordinator: Ass. Prof. Dr. M. Elzahar

Programme coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

8/2019

CES-507
Quality Control and Quality Assurance Course Specification

Course Specification

Program on which the course is given	M. Sc. in Civil Engineering (Specialization: Construction Engineering)
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	M. Sc. 2018/2019
Date of specification approval	*2018*

A- Basic Information

Title: Quality Control and Quality Assurance	**Code Symbol: CES 507**	
Lecture	**2 hours**	
Tutorial / Laboratory	**1 hours**	
Total	**3 hours**	**By law 2000**

B- Professional Information

1- Course Aims:

This course aims, in general, to activate the student knowledge and understanding in the direction of implementing Quality Control and Quality Assurance topics. Having learned his/her basic Quality Control in previous courses, the student is subjected in this course to five main topics in this course. These topics are: Methods for Design the concrete mix, Technical Inspection, Quality Control steps, Quality assurance steps and The foundations of quality assurance programs. During the course, the student is trained on several problems, understand the basics of each topic to make sure of his/her capability to face the profession and to be capable of evaluating Quality Control and Quality Assurance problems and use his information in solving field problems.
The main Objectives of this course are to equip the students with:

1- Demonstration of the knowledge and understanding the problems of Methods for Design the concrete mix.
2- Demonstration of the knowledge and understanding of problems of Technical Inspection.
3- Demonstration of the knowledge and understanding the Quality Control steps.
4- Demonstration of the knowledge and understanding the Quality assurance steps.
5- Demonstrate the knowledge and understanding The foundations of quality assurance programs

2- Intended Learning Outcomes (ILOs)

NAQAAE Academic Reference Standards (ARS)	Program ILOs	Course ILOs
A. Knowledge and understanding		
A1. Theories and basics related to learning field, as well as other related fields.	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of structural Engineering.	a1-1 Describe the principles of Methods for Design the concrete mix.
B. Intellectual skills		
B1- Analyze and evaluate the information in the field of specialization, and solve the problems based on that. .	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.	b1-1 Describe the principles of Technical Inspection.
C. Professional and practical skills		
C1- Mastering the basics as well as the latest professional skills in the field of specialization.	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.	c1-1 Describe the Quality Control steps Quality assurance steps.
D. General and transferrable skills		
D2- Use information technology to improve his/her professional practice	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems	d2-1 Express to monitor and evaluate The foundations of quality assurance programs. .

3- Course Contents

Topic	*Total Hours*	*Contact hrs*			*Course ILOs Covered (By No.)*
		Lec.	Tut.	Lab.	
1- Methods for Design the concrete mix.	18	12	6	--	a1-1, b1-1,c1-1
2- Technical Inspection.	18	12	6	--	a1-1, b1-1, c1-1, d2-1
3- The Quality Control steps.	18	12	6	--	c1-1, d2-1
4- the Quality Assurance steps.	18	12	6	--	a1-1, b1-1, c1-1
5- The foundations of quality assurance programs.	12	8	4	--	a1-1, b1-1, c1-1, d2-1
Total	84	56	28	--	

4- Relationship between the course and the Program

Field	Academic Reference Standard(ARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contribute in achieving	A1(a1-1)	B1(b1-1)	C1(c1-1)	D2(d2-1)

5- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
---	---	20%	10%	70%			100%

6- Course Topics.

Topic No.	Topic	Weeks
1st	Methods for Design the concrete mix.	1-6
2nd	Technical Inspection.	7-12

3rd	The Quality Control steps.	13-18
4th	the Quality Assurance steps.	19-24
5th	The foundations of quality assurance programs.	25-28

7- ILOs Matrix Topics

Course topics	1st	2nd	3rd	4th	5th
Course ILOs	Knowledge & Understanding				
a1-1 Describe the principles of High speed trains.	x		x	x	x
Course ILOs	Intellectual skills				
b1-1 Design the different types of non-ballasted track.	x	x	x	x	x
Course ILOs	Professional and practical skills				
c1-1 Describe the principles of railway track buckling.	x	x	x	x	x
Course ILOs	General and transferrable skills				
d2-1 Express to monitor and evaluate rail-road crossings.	x		x	x	x

8- Teaching and Learning Method:

Course Intended learning outcomes (ILOs)		Teaching and Learning Method												
		Lecture	Presentation and	Discussion	Tutorial	Problem solving	Brain storming	Projects	Report	Self learning	Cooperative	Discovering	Computer Simulation	Practical Experiments
Knowledge & understanding	a1-1	x				x								
Intellectual Skills	b1-1		x											
Professional Skills	c1-1		x											
General Skills	d2-1												x	

9- Assessment

9.1 Assessment Methods

Final Written Examination	:	to assess students' knowledge, understanding, analysis, creativity, problem solving, and problem identification.

9.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final Examination	100	32
Total	100%	

10- Facilities required for teaching and learning

Class Room Equipped with Computer and Video Projector - Computer Lab with Preinstalled MATLAB software package (last version) - Library.

A. laboratory Usage:

Students are expected to prepare and conduct some computer simulation assignments using digital systems simulators on general computer labs.

B. Library Usage:

Students should be encouraged to use library technical resources in the preparation of laboratory reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

11- List of references:

11.1- Course Notes - **Course Notes & CD , by course co-orinator.**

12- Program Coordination Committee:

Course Coordinator: **Dr. Eng. NourAllah Mohamed Hussein**

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

8/82018

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2018 / 2019 M.Sc. and Diploma
Date of specification approval	2018

A- Basic Information

Title: Site Investigation and Soil Testing	**Code Symbol**: **CES 511**	
Lecture	2	
Tutorial	**1**	
Laboratory	**0**	
Total	3	Bylaw 2000
First term	prerequisite	

B- Professional Information

1- Course Aims:

This course introduces various site investigation techniques, in-site and laboratory tests, field measurements, measuring the aggression of soil and ground water.

2- Course Objectives

By the end of the course the students will be able to:

- Introduction to Site Investigation
- Introduction to Soil Testing
- Understanding various site investigation techniques
- Understanding in-site and laboratory tests
- Understanding field measurements,
- Understanding measuring the aggression of soil and ground water

3- Intended Learning Outcomes (ILOs):

Field	Program ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A1. Theories and basics related to learning field, as well as other related fields.	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Structural Engineering.
	A2- Mutual relation between professional aspects of professional practice and its effects on the Environment.	a2-1 Discuss the effects of civil engineering technologies on the surrounding environment.
	A3- Main scientific advances in the field of specialization.	a3-1 Classify the Potential applications of advanced civil engineering applications.
		a3-3 Discuss the recent and update developments in the most important themes related to civil engineering.
Intellectual skills	B1- Analyze and evaluate the information in the field of specialization, and solve the problems based on that.	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.
		b1-2 Interpret, analyze, and evaluate a given system specific information and relate it to the design of the required system.
	B2- Solve specialized problems even with lack of some data and variables, (incomplete data).	b2-1 Apply broad knowledge of modern computational methods and think critically to solve unstructured problems (with incomplete data) related to civil engineering.
	B3- Link and integrate diverse knowledge to solve professional problems.	b3-1 Analyze, interpret and manipulate data from a variety of sources and relate it to solve professional problems.
		b3-2 Use integrated approaches to solve problems scientifically
Professional skills	C1- Mastering the basics as well as the latest professional skills in the field of specialization.	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.
General skills	D2- Use information technology to improve his/her professional practice.	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems.
	D5- Use different resources to obtain knowledge and information.	d5-1 Use different resources of information like libraries, internet access facilities, etc. to upgrade and enhance their conceptual knowledge.

4- Course Contents

Week No.	*Topic*	*Total Hours*	*Contact hrs*			*Course ILOs Covered(By No.)*
			Lec.	**Tut.**	**Lab.**	
Week(1-2)	Introduction to Site Investigation	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**
Week(3-4)	Introduction to Soil Testing	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**
Week(5-6)	Understanding various site investigation techniques	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**
Week(7-9)	Understanding in-site and laboratory tests	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**
Week(10-11)	Understanding field measurements,	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**
Week(12-13)	Understanding measuring the aggression of soil and ground water	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**

5- Relationship between the course and the Program

Field	**Academic Reference Standard(ARS)**			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contribute in achieving	**A1, A2, A3**	**B1, B2, B3**	**C1**	**D2, D5**

6- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Discretionary subjects	Total
----	**5%**	**50 %**	**10%**	**---**	**30%**	**5%**	**100%**

7- Course Topics.

Topic No.	Topic	Weeks
1st	Introduction to Site Investigation	**1-2**
2nd	Introduction to Soil Testing	**3-4**
3rd	Understanding various site investigation techniques	**5-6**
4th	Understanding in-site and laboratory tests	**7-9**
5th	Understanding field measurements,	**10-11**
6th	Understanding measuring the aggression of soil and ground water	**12-13**

8- ILOs Matrix Topics

Course Intended Learning Outcomes (ILOs)		Course topics					
		1st	**2nd**	**3rd**	**4th**	**5th**	**6th**
Knowledge & Understanding	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Structural Engineering.	x	**x**	**x**	**x**	**x**	**x**
	a2-1 Discuss the effects of civil engineering technologies on the surrounding environment.	x	**x**	**x**	**x**	**x**	**x**
	a3-1 Classify the Potential applications of advanced civil engineering applications.	x	**x**	**x**	**x**	**x**	**x**
	a3-3 Discuss the recent and update developments in the most important themes related to civil engineering.	x	**x**	**x**	**x**	**x**	**x**
Intellectual Skills	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.	x	**x**	**x**	**x**	**x**	**x**
	b1-2 Interpret, analyze, and evaluate a given system specific information and relate it to the design of the required system.	x	**x**	**x**	**x**	**x**	**x**

	b2-1 Apply broad knowledge of modern computational methods and think critically to solve unstructured problems (with incomplete data) related to civil engineering.	x	**x**	**x**	**x**	**x**	**x**
	b3-1 Analyze, interpret and manipulate data from a variety of sources and relate it to solve professional problems.	x	**x**	**x**	**x**	**x**	**x**
	b3-2 Use integrated approaches to solve problems scientifically	x	**x**	**x**	**x**	**x**	**x**
Professional Skill	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.	x	**x**	**x**	**x**	**x**	**x**
General Skills	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems.	x	**x**	**x**	**x**	**x**	**x**
	d5-1 Use different resources of information like libraries, internet access facilities, etc. to upgrade and enhance their conceptual knowledge.	x	**x**	**x**	**x**	**x**	**x**

9- Teaching and Learning Method:

Course Intended Learning Outcome (ILOs)		**Teaching and Learning Method:**												
		Lecture	**Presentation and Movies**	**Discussion**	**Tutorial**	**Problem solving**	**Brain storming**	**Projects**	**Site visits**	**Self-learning**	**Cooperative**	**Discovering**	**Modeling**	**Playing**
A- Knowledge& Understanding	**a1-1**	**x**		**x**				**x**						
	a2-1	**x**		**x**				**x**						
	a3-1	**x**		**x**				**x**						
	a3-3	**x**		**x**				**x**						
B-IntellectualSkills	**b1-1**	**x**		**x**				**x**						
	b1-2	**x**		**x**				**x**						
	b2-1	**x**		**x**				**x**						
	b3-1	**x**		**x**				**x**						
	b3-2	**x**		**x**				**x**						
C-Professional Skills	**c1-1**	**x**		**x**				**x**						
D-General Skills	**d2-1**	**x**		**x**				**x**						
	d5-1	**x**		**x**				**x**						

10- Teaching and learning method for low capacity and outstanding Student

For low capacity students	Assign a portion of the office hours for those students.
	Give them specific tasks.
	Repeat the explanation of some of the material and tutorials.
	Assign a teaching assistance to follow up the performance of this group of students.
For outstanding Students	Hand out project assignments to those students.
	Give them some research topics to be searched using the internet and conduct presentation.
	Encourage them to take parts in the running research projects.

11- Assessment:

11.1 Assessment Methods

Course Intended Learning Outcome (ILOs)		Assessment Methods											
		Written Exam	Oral Exam	Tutorial Assessment	Project Assessment	Model Assessment	Report Assessment	Quiz assessment	Presentation Assessment	Discussion	Laboratory Test	Sketching drawings	Monitoring
A- Knowledge& Understanding	a1-1	x						x		x			
	a2-1	x						x		x			
	a3-1	x						x		x			
	a3-3	x						x		x			
B-IntellectualSkills	b1-1	x						x		x			
	b1-2	x						x		x			
	b2-1	x						x		x			
	b3-1	x						x		x			
	b3-2	x						x		x			
C-Professional Skills	c1-1	x						x		x			
D-General Skills	d2-1	x						x		x			
	d5-1	x						x		x			

11.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final examination	**100**	
Mid-term written examination	**0**	
End of term laboratory examination	**0**	
Tutorial and report assessment	**0**	
Total	**100%**	

12- Facilities required for teaching and learning

A. **Laboratory Usage:**

B. **Library Usage:**

Students should be encouraged to use library technical resources in the preparation of reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

13- List of references:

- Knappett, J. and Craig, R., Craig's Soil Mechanics 8th edition, 2012
- Das, B. Principles of Geotechnical Engineering 9th edition, 2017
- Egyptian Code for Soil Mechanics, design and construction of foundations (2007).

Course Prof:

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

8/82018

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019 / 2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title: Ground Improvement	**Code Symbol**: **CES 512**	
Lecture	2	
Tutorial	**1**	
Laboratory	**0**	
Total	3	Bylaw 2000
First term	prerequisite	

B- Professional Information

1- Course Aims:

This course introduces methods of ground improvement, mechanical methods, hydrological methods, and mixtures, soil reinforcement, soil grouting, study cases.

2- Course Objectives

By the end of the course the students will be able to:

- Understanding the methods of ground improvement
- Understanding the mechanical methods of ground improvement
- Understanding hydrological methods of ground improvement
- Understanding the soil reinforcement
- Understanding the soil grouting
- study cases.

3- Intended Learning Outcomes (ILOs):

Field	Program ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	A1. Theories and basics related to learning field, as well as other related fields.	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Structural Engineering.
	A2- Mutual relation between professional aspects of professional practice and its effects on the Environment.	a2-1 Discuss the effects of civil engineering technologies on the surrounding environment.
	A3- Main scientific advances in the field of specialization.	a3-1 Classify the Potential applications of advanced civil engineering applications.
		a3-3 Discuss the recent and update developments in the most important themes related to civil engineering.
Intellectual skills	B1- Analyze and evaluate the information in the field of specialization, and solve the problems based on that.	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.
		b1-2 Interpret, analyze, and evaluate a given system specific information and relate it to the design of the required system.
	B2- Solve specialized problems even with lack of some data and variables, (incomplete data).	b2-1 Apply broad knowledge of modern computational methods and think critically to solve unstructured problems (with incomplete data) related to civil engineering.
	B3- Link and integrate diverse knowledge to solve professional problems.	b3-1 Analyze, interpret and manipulate data from a variety of sources and relate it to solve professional problems.
		b3-2 Use integrated approaches to solve problems scientifically
Professional skills	C1- Mastering the basics as well as the latest professional skills in the field of specialization.	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.
General skills	D2- Use information technology to improve his/her professional practice.	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems.
	D5- Use different resources to obtain knowledge and information.	d5-1 Use different resources of information like libraries, internet access facilities, etc. to upgrade and enhance their conceptual knowledge.

4- Course Contents

Week No.	*Topic*	*Total Hours*	*Contact hrs*			*Course ILOs Covered(By No.)*
			Lec.	**Tut.**	**Lab.**	
Week(1-2)	Understanding the methods of ground improvement	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**
Week(3-4)	Understanding the mechanical methods of ground improvement	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**
Week(5-6)	Understanding hydrological methods of ground improvement	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**
Week(7-9)	Understanding the soil reinforcement	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**
Week(10-11)	Understanding the soil grouting	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**
Week(12-13)	study cases.	3	3			**a1-1, a2-1, a3-1, a3-3, b1-1, b1-2, b2-1, b3-1, b3-2, c1-1, d2-1, d5-1**

5- Relationship between the course and the Program

Field	**Academic Reference Standard(ARS)**			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contribute in achieving	**A1, A2, A3**	**B1, B2, B3**	**C1**	**D2, D5**

6- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
----	**5%**	**50 %**	**10%**	**---**	**30%**	**5%**	**100%**

7- Course Topics.

Topic No.	Topic	Weeks
1st	Understanding the methods of ground improvement	**1-2**
2nd	Understanding the mechanical methods of ground improvement	**3-4**
3rd	Understanding hydrological methods of ground improvement	**5-6**
4th	Understanding the soil reinforcement	**7-9**
5th	Understanding the soil grouting	**10-11**
6th	study cases.	**12-13**

8- ILOs Matrix Topics

Course Intended Learning Outcomes (ILOs)		Course topics					
		1st	**2nd**	**3rd**	**4th**	**5th**	**6th**
Knowledge & Understanding	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Structural Engineering.	x	**x**	**x**	**x**	**x**	**x**
	a2-1 Discuss the effects of civil engineering technologies on the surrounding environment.	x	**x**	**x**	**x**	**x**	**x**
	a3-1 Classify the Potential applications of advanced civil engineering applications.	x	**x**	**x**	**x**	**x**	**x**
	a3-3 Discuss the recent and update developments in the most important themes related to civil engineering.	x	**x**	**x**	**x**	**x**	**x**
Intellectual Skills	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.	x	**x**	**x**	**x**	**x**	**x**

	b1-2 Interpret, analyze, and evaluate a given system specific information and relate it to the design of the required system.	x	**x**	**x**	**x**	**x**	**x**
	b2-1 Apply broad knowledge of modern computational methods and think critically to solve unstructured problems (with incomplete data) related to civil engineering.	x	**x**	**x**	**x**	**x**	**x**
	b3-1 Analyze, interpret and manipulate data from a variety of sources and relate it to solve professional problems.	x	**x**	**x**	**x**	**x**	**x**
	b3-2 Use integrated approaches to solve problems scientifically	x	**x**	**x**	**x**	**x**	**x**
Professional Skill	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.	x	**x**	**x**	**x**	**x**	**x**
General Skills	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems.	x	**x**	**x**	**x**	**x**	**x**
	d5-1 Use different resources of information like libraries, internet access facilities, etc. to upgrade and enhance their conceptual knowledge.	x	**x**	**x**	**x**	**x**	**x**

9- Teaching and Learning Method:

Course Intended Learning Outcome (ILOs)		**Teaching and Learning Method:**												
		Lecture	**Presentation and Movies**	**Discussion**	**Tutorial**	**Problem solving**	**Brain storming**	**Projects**	**Site visits**	**Self-learning**	**Cooperative**	**Discovering**	**Modeling**	**Playing**
A- Knowledge& Understanding	**a1-1**	**x**		**x**				**x**						
	a2-1	**x**		**x**				**x**						
	a3-1	**x**		**x**				**x**						
	a3-3	**x**		**x**				**x**						
B-IntellectualSkills	**b1-1**	**x**		**x**				**x**						
	b1-2	**x**		**x**				**x**						
	b2-1	**x**		**x**				**x**						
	b3-1	**x**		**x**				**x**						
	b3-2	**x**		**x**				**x**						
C-Professional Skills	**c1-1**	**x**		**x**				**x**						
D-General Skills	**d2-1**	**x**		**x**				**x**						
	d5-1	**x**		**x**				**x**						

10- Teaching and learning method for low capacity and outstanding Student

For low capacity students	Assign a portion of the office hours for those students.
	Give them specific tasks.
	Repeat the explanation of some of the material and tutorials.
	Assign a teaching assistance to follow up the performance of this group of students.
For outstanding Students	Hand out project assignments to those students.
	Give them some research topics to be searched using the internet and conduct presentation.
	Encourage them to take parts in the running research projects.

11- Assessment:

11.1 Assessment Methods

Course Intended Learning Outcome (ILOs)		Assessment Methods											
		Written Exam	Oral Exam	Tutorial Assessment	Project Assessment	Model Assessment	Report Assessment	Quiz assessment	Presentation Assessment	Discussion	Laboratory Test	Sketching drawings	Monitoring
A- Knowledge& Understanding	**a1-1**	x						x		x			
	a2-1	x						x		x			
	a3-1	x						x		x			
	a3-3	x						x		x			
B-IntellectualSkills	**b1-1**	x						x		x			
	b1-2	x						x		x			
	b2-1	x						x		x			
	b3-1	x						x		x			
	b3-2	x						x		x			
C-Professional Skills	**c1-1**	x						x		x			
D-General Skills	**d2-1**	x						x		x			
	d5-1	x						x		x			

11.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final examination	**100**	
Mid-term written examination	**0**	
End of term laboratory examination	**0**	
Tutorial and report assessment	**0**	
Total	**100%**	

12- Facilities required for teaching and learning

A. **Laboratory Usage:**

B. **Library Usage:**

Students should be encouraged to use library technical resources in the preparation of reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

13- List of references:

- Knappett, J. and Craig, R., Craig's Soil Mechanics 8th edition, 2012
- Das, B. Principles of Geotechnical Engineering 9th edition, 2017
- Egyptian Code for Soil Mechanics, design and construction of foundations (2007).

Course Prof:

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

8/2019

Course Specification

Program on which the course is given	MSc in Civil Engineering (Specialization: Structural Engineering).
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019/2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title: Fabrications, Erection and Maintenance of Steel Structures	**Code Symbol: CES 519**	
Lecture	**2 hours**	
Tutorial / Laboratory	**1 hours**	
Total	**3 hours**	**By law 2003**

B- Professional Information

1- Course Aims:

This course is designed to extend advanced concepts learned in Fabrication of steel structures, automatic production lines, mass production, tolerances, different methods of erection, method of strengthening, inspection and maintenance requirements of steel structures.

The main Objectives of this course are to equip the students with:

1. Knowledge and understanding of key and advanced facts, theories, concepts, principles and techniques relevant to fabrication of steel structures.
2. Advanced skills in the definition automatic production lines, mass production, tolerances .
3. The ability to know different methods of erection
4. Identify inspection and maintenance requirements of steel structures
5. Proficiency in the application of the basics and the methodologies of scientific research and the use of its different tools in the area in fabrication of steel structures

2- Intended Learning Outcomes (ILOs)

NAQAAE Academic Reference Standards (ARS)	Program ILOs	Course ILOs
A. Knowledge and understanding		
A1. Theories and basics related to learning field, as well as other related fields.	a1-2 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of **sructural Engineering.**	a1-2 Describe Fabrication of steel structures
A3- Main scientific advances in the field of specialization.	a3-1 Classify the Potential applications of advanced civil engineering applications.	a3-1 Discuss the social effects of automatic production lines, mass production
	a3-3 Discuss the recent and update developments in the most important themes related to civil engineering.	a3-3 Discuss the recent and update developments in the most important different methods of erection.
B. Intellectual skills		
B1- Analyze and evaluate the information in the field of specialization, and solve the problems based on that. .	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.	b1-1 Demonstrate an investigatory and analytic thinking approach to method of strengthening
B3- Link and integrate diverse knowledge to solve professional problems.	b3-1 Analyze, interpret and manipulate data from a variety of sources and relate it to solve professional problems.	b3-1 Analyze, interpret and manipulate data from a variety of sources and relate it to inspection and maintenance requirements of steel structures.
C. Professional and practical skills		
C1- Mastering the basics as well as the latest professional skills in the field of specialization.	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions related to inspection and maintenance requirements of steel structures problems, using latest engineering techniques, skills, and tools.

D. General and transferrable skills		
D2- Use information technology to improve his/her professional practice	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems	d2-1 Use state-of-the-art computer and Internet tools for getting latest information and standards related to Fabrication of steel structures.

3- Course Contents

Topic	*Total Hours*	*Contact hrs*			*Course ILOs Covered (By No.)*
		Lec.	Tut.	Lab.	
1- Fabrication of steel structures.	12	8	4	--	a1-2, a3-1,a3-3, b1-1,b3-1, c1-1
2- automatic production lines.	12	8	4	--	a1-2, a3-1,a3-3, b1-1, c1-1, d2-1
3- different methods of erection.	12	8	4	--	a3-1,a3-3, b1-1,b3-1, c1-1, d2-1
4- method of strengthening.	12	8	4	--	a1-2, a3-1,a3-3, b1-1,b3-1, c1-1, d2-1
5- inspection and maintenance requirements of steel structures.	12	8	4	--	a1-2, a3-1, b1-1,b3-1, c1-1, d2-1
6- mass production, tolerances.	12	8	4	--	a3-1,a3-3, b1-1,b3-1, c1-1, d2-1
Total	72	48	24	--	

4- Relationship between the course and the programme

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programmed Academic Standards that the course contribute in achieving	A1(a1-2) A3(a3-1, a3-3)	B1(b1-1), B3(b3-1)	C1(c1-1)	D2(d2-1)

5- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
---	--10%-	30%	60%	00%			100%

6- Course Topics.

Topic No.	Topic	Weeks
1st	Review of Fabrication of steel structures...	1-5
2nd	automatic production lines.	6-10
3rd	different methods of erection.	11-15
4th	method of strengthening	16-20
5th	inspection and maintenance requirements of steel structures.	21-25
6th	mass production, tolerances..	26-28

7- ILOs Matrix Topics

Course topics	1st	2nd	3rd	4th	5th	6th	7th
Course ILOs	Knowledge & Understanding						
a1-2 Describe Fabrication of steel structures.	x		x	x	x	x	x
a3-1 Discuss the social effects of automatic production lines, mass production		x					
a3-3 Discuss the recent and update developments in the most important different methods of erection..	x	x	x	x	x	x	x
Course ILOs	Intellectual skills						
b1-1 Demonstrate an investigatory and analytic thinking approach to method of strengthening..	x	x	x	x	x	x	X
b3-1 Analyze, interpret and manipulate data from a variety of sources and relate it to inspection and maintenance requirements of steel structures		x					X
Course ILOs	Professional and practical skills						
c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions related to	x	x	x	x	x	x	x

inspection and maintenance requirements of steel structures problems, using latest engineering techniques, skills, and tools.techniques, skills, and tools.								
Course ILOs	General and transferrable skills							
d2-1 Use state-of-the-art computer and Internet tools for getting latest information and standards related to Fabrication of steel structures..	x		x	x	x	x	x	

8- Teaching and Learning Method:

Course Intended learning outcomes (ILOs)		Teaching and Learning Method												
		Lecture	Presentation and	Discussion	Tutorial	Problem solving	Brain storming	Projects	Report	Self learning	Cooperative	Discovering	Computer Simulation	Practical Experiments
Knowledge & understanding	a1-2	x				x								
	a3-1	x				x								
	a3-3		x	x					x	x				
Intellectual Skills	b1-1		x											
	b3-1		x											
Professional Skills	c1-1		x											
General Skills	d2-1												x	

9- Assessment

9.1 Assessment Methods

Final Written Examination : to assess students' knowledge, understanding, analysis, creativity, problem solving, and problem identification.

9.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final Examination	100	32
Total	100%	

10- Facilities required for teaching and learning

Class Room Equipped with Computer and Video Projector - Computer Lab - Library.

A. laboratory Usage:

Students are expected to prepare and conduct some computer simulation assignments using digital systems simulators on general computer labs.

B. Library Usage:

Students should be encouraged to use library technical resources in the preparation of laboratory reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

11- List of references:

- Knappett, J. and Craig, R., Craig's Soil Mechanics 8th edition, 2012
- Das, B. Principles of Geotechnical Engineering 9th edition, 2017
- Egyptian Code for Soil Mechanics, design and construction of foundations (2007).

12- Program Coordination Committee:

Course Coordinator: **Dr. Mostafa Marzok**

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

Date: **8/2019**

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019/2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title:Methods of Repair and Strengthening of Concrete Structures	**Code Symbol**: **CES 526**	
Lecture	2	
Tutorial	**1**	
Laboratory	**0**	
Total	3	Bylaw 2000
First term	prerequisite	

B- Professional Information

1- Course Aims:

This course introduces Causes of defects, evaluation of structures, materials for repair and strengthening, repair methods, strengthening methods.

2- Course Objectives

By the end of the course the students will be able to:

- Understanding Causes of defects
- Understanding evaluation of structures
- Understanding materials for repair
- Understanding materials for strengthening
- Understanding repair methods
- Understanding strengthening methods.

3- Intended Learning Outcomes (ILOs):

Field	Program ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	**A-1** Theories and basics related to learning field, as well as other related fields.	**a1-3** Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Public Work Engineering.
	A-6 Basics and ethics of scientific research	**a6-1** Recognize Basics and ethics of scientific research.
Intellectual skills	**B-2** Solve specialized problems even with lack of some data and variables, (incomplete data).	**b2-1** Apply broad knowledge of modern computational methods and think critically to solve unstructured problems (with incomplete data) related to civil engineering.
	B-3 Link and integrate diverse knowledge to solve professional problems	**b3-2** Use integrated approaches to solve problems scientifically.
Professional skills	**C-3** Evaluate means and tools available in the field of practice	**c3-1** Evaluate methods and tools reported in a specified published articles and researches concerning to civil engineering field.
General skills	**D-2** Use information technology to improve his/her professional practice.	**d2-1** Use state-of-the-art computer design tools and applications for solving civil engineering problems.

4- Course Contents

Week No.	*Topic*	*Total Hours*	*Contact hrs*			*Course ILOs Covered(By No.)*
			Lec.	**Tut.**	**Lab.**	
Week1-4	Understanding Causes of defects	3	3			**a1-3, a6-1**
Week5-8	Understanding evaluation of structures	3	3			**a1-3, a6-1 , b2-1**
Week9-12	Understanding materials for repair	3	3			**a6-1 , b2-1, b3-2**
Week13-16	Understanding materials for strengthening	3	3			**a6-1 , b2-1, b3-2**
Week17-21	Understanding repair methods	3	3			**b2-1, b3-2, c3-1**
Week22-30	Understanding strengthening methods.	3	3			**c3-1 ,** d2-1

5- Relationship between the course and the Program

Field	Academic Reference Standard(ARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contribute in achieving	**a1& a6**	**b2 & b3**	**c3**	**d2**

6- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
----	**5%**	**50 %**	**10%**	**---**	**30%**	**5%**	**100%**

7- Course Topics.

Topic No.	Topic	Weeks
1st	Understanding Causes of defects	**1-3**
2nd	Understanding evaluation of structures	**4-7**
3rd	Understanding materials for repair	**8-10**
4th	Understanding materials for strengthening	**10-14**
5th	Understanding repair methods	**15-20**
6th	Understanding strengthening methods.	**20-30**

8- ILOs Matrix Topics

Course Intended Learning Outcomes (ILOs)		Course topics					
		1st	2nd	3rd	4th	5th	6th
Knowledge & Understanding	**a-1** Theories and basics related to learning field, as well as other related fields.	x			**x**	**x**	**x**
	a-6 Basics and ethics of scientific research	**x**			**x**	**x**	**x**
Intellectual Skills	**b-2** Solve specialized problems even with lack of some data and variables, (incomplete data).		**x**	**x**	**x**		
	b-3 Link and integrate diverse knowledge to solve professional problems		**x**	**x**	**x**		
Professional Skill	**c-3** Evaluate means and tools available in the field of practice		**x**	**x**	**x**		
General Skills	**d-2** Use information technology to improve his/her professional practice.					x	x

9- Teaching and Learning Method:

Course Intended Learning Outcome (ILOs)		Teaching and Learning Method:												
		Lecture	Presentation and Movies	Discussion	Tutorial	Problem solving	Brain storming	Projects	Site visits	Self-learning	Cooperative	Discovering	Modeling	Playing
A- Knowledge& Understanding	a1-3	x		x										
	a6-1	x		x										
B-IntellectualSkills	b2-1	x		x										
	b3-2	x		x										
C-Professional Skills	c3-1	x		x				x						
D-General Skills	d2-1	x		x				x						

10- Teaching and learning method for low capacity and outstanding Student

For low capacity students	Assign a portion of the office hours for those students.
	Give them specific tasks.
	Repeat the explanation of some of the material and tutorials.
	Assign a teaching assistance to follow up the performance of this group of students.
For outstanding Students	Hand out project assignments to those students.
	Give them some research topics to be searched using the internet and conduct presentation.
	Encourage them to take parts in the running research projects.

11- Assessment:

11.1 Assessment Methods

Course Intended Learning Outcome (ILOs)		Assessment Methods											
		Written Exam	Oral Exam	Tutorial Assessment	Project Assessment	Model Assessment	Report Assessment	Quiz assessment	Presentation Assessment	Discussion	Laboratory Test	Sketching drawings	Monitoring
A- Knowledge& Understanding	a1-3	x											
	a6-1	x											
B-IntellectualSkills	b2-1	x											
	b3-2	x											
C-Professional Skills	c3-1	x								x			
D-General Skills	d2-1	x						x					

11.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final examination		
Mid-term written examination		
End of term laboratory examination		
Tutorial and report assessment		
Total	100%	

12- Facilities required for teaching and learning

A. **Laboratory Usage:**

B. **Library Usage:**

Students should be encouraged to use library technical resources in the preparation of reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

13- List of references:

1- Graham M. Winch, Management Construction Projects, 2nd ed. 2010.
2- Sidney M.levy, Project Management in Construction, 1st ed. 2002.
3- GEORGE j. RITZ , Total Construction Project Management,1993.

Course Prof:

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

Date: 8/2019

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019/2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title: General Management in Construction Projects	**Code Symbol: CES 527**	
Lecture	**3 hours**	
Tutorial / Laboratory	**--**	
Total	**3 hours**	**By law 2003**

B- Professional Information

1- Course Aims:

This course is designed to extend basic concepts learned of essential knowledge and information for The life cycle of construction projects, starting from organizations contracts concepts . Also it aims to Studying relationships and responsibilities of all participants in the construction projects. The course provides the student to recognize the reconstruction investigations, construction phase responsibilities. For those students who look toward Management in Construction Projects position after graduation, this course is designed to widen background in this field. This course will also provide an excellent opportunity to prepare the graduates for advanced study in Quality assurance. The course is meant to create the deep understanding of the basics and theories behind management information systems, planning and control techniques.

The main Objectives of this course are to equip the students with:

1. Recognize development and application of construction phase responsibilities.

2. Recognize development and application of organizations contracts concepts, relationships and responsibilities of all participants in the construction projects.
3. How to construct and organizations contracts.
4. Recognize the life cycle of construction projects.
5. Recognize the quality assurance, value engineering, management information systems, planning and control techniques, applications.

2- Intended Learning Outcomes (ILOs)

NAQAAE Academic Reference Standards (ARS)	Program ILOs	Course ILOs
A. Knowledge and understanding		
A1. A1. Theories, basics and specialized knowledge in the field of learning, as well as the subjects that affect his/her professional practice.	a1-2 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Management in Construction.	a1-2 Deterministic and stochastic relationships and responsibilities of all participants in the construction projects.
A3- Main scientific advances in the field of specialization.	a3-1 Discuss the recent and update developments in the most important themes related to civil engineering.	a3-1 Discuss the recent and update developments in the most important themes related to management information systems, planning and control techniques.
B. Intellectual skills		
B1- Analyze and evaluate the information in the field of specialization, and solve the problems based on that.	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.	b1-1 Demonstrate an investigatory and analytic thinking approach to solve the contracts and quality assurance.
C. Professional and practical skills		
C1- Mastering the basics as well as the latest professional skills in the field of	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions,	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions related to construction phase responsibilities, using

specialization.	using latest engineering techniques, skills, and tools.	latest engineering techniques, skills, and tools.
D. General and transferrable skills		
D2- Use information technology to improve his/her professional practice	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems	d2-1 Use state-of-the-art computer and Internet tools for getting latest information and standards related to The life cycle of construction projects.

3- Course Contents

Topic	*Total Hours*	*Contact hrs*			*Course ILOs Covered (By No.)*
		Lec.	Tut.	Lab.	
1. The life cycle of construction projects.	12	8	4	--	a1-2, , b1-1, c1-1, d2-1
2. Organizations contracts concepts.	12	8	4	--	a1-2,b1-1, c1-1, d2-1
3. Relationships and responsibilities of all participants in the construction projects.	24	16	8	--	a1-2, a3-1, b1-1, c1-1, d2-1
4. Application of construction phase responsibilities.	12	8	4	--	a1-2, a3-1, b1-1, c1-1, d2-1
5. Management information systems.	12	8	4	--	a1-2, a3-1, b1-1
6. planning and control techniques, applications.	12	8	4	--	a1-2, a3-1, b1-1, c1-1
Total	84	56	28	--	

4- Relationship between the course and the Program

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contribute in achieving	A1(a1-2) A3(a3-1)	B1(b1-1)	C1(c1-1)	D2(d2-1)

5- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
---	---	50%	30%	10%			100%

6- Course Topics.

Topic No.	Topic	Weeks
1st	Deterministic the life cycle of construction projects	1-4
2nd	Organizations contracts concepts.	5-8
3rd	Relationships and responsibilities of all participants in the construction projects.	9-16
4th	Application of construction phase responsibilities.	17-21
5th	Management information systems.	22-24
6th	planning and control techniques, applications.	25-28

7- ILOs Matrix Topics

Course topics	1st	2nd	3rd	4th	5th	6th
Course ILOs	Knowledge & Understanding					
a1-2 Deterministic and stochastic relationships and responsibilities of all participants in the construction projects.	x	x	x	x	x	x
a3-1 Discuss the recent and update developments in the most important themes related to management information systems, planning and control techniques.			x	x	x	x
Course ILOs	Intellectual skills					
b1-1 Demonstrate an investigatory and analytic thinking approach to solve the contracts and quality assurance.	x	x	x	x	x	x
Course ILOs	Professional and practical skills					
c1-1 Express competence	x	x	x	x		x

skills, such as identifying, formulating, analyzing, and creating engineering solutions related to construction phase responsibilities, using latest engineering techniques, skills, and tools.						
Course ILOs	General and transferrable skills					
d2-1 Use state-of-the-art computer and Internet tools for getting latest information and standards related to The life cycle of construction projects.	x	x	x	x		

8- Teaching and Learning Method:

Course Intended learning outcomes (ILOs)		Teaching and Learning Method												
		Lecture	Movies Presentation and	Discussion	Tutorial	Problem solving	Brain storming	Projects	Report	Self learning	Cooperative	Discovering	Computer Simulation	Practical Experiments
Knowledge & understanding	a1-2	x				x								
	a3-1		x	x					x	x				
Intellectual Skills	b1-1		x											
Professional Skills	c1-1		x											
General Skills	d2-1												x	

9- Assessment

9.1 Assessment Methods

Final Written Examination : To assess students' knowledge, understanding, analysis, creativity, problem solving, and problem identification.

9.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final Examination	100	32
Total	100%	

10- Facilities required for teaching and learning

Class Room Equipped with Computer and Video Projector - Library.

A. Library Usage:

Students should be encouraged to use library technical resources in the preparation of laboratory reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

11- List of references:

1. Graham M. Winch, Management Construction Projects, 2nd ed. 2010.
2. Sidney M.levy, Project Management in Construction, 1st ed. 2002.
3. GEORGE j. RITZ , Total Construction Project Management,1993.

12- Program Coordination Committee:

Course Coordinator: **Dr Mohamed Zaghlol**

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

Date: 8/2019

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019 / 2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title: Projects Planning and control	**Code Symbol**: **CES 528**	
Lecture	2	
Tutorial	**1**	
Laboratory	**0**	
Total	3	Bylaw 2000
First term	prerequisite	

B- Professional Information

1- Course Aims:

This course introduces Construction planning and organizations, planning techniques, check list, S-curve, bar chart, matrix schedule, line of balance, network, CPM and PERT, resource allocation and leveling, linear programming and applications.

2- Course Objectives

By the end of the course the students will be able to:

- Understanding Construction planning and organizations
- Understanding planning techniques
- Understanding check list
- Understanding S-curve
- Understanding CPM and PERT
- Understanding resource allocation and leveling

3- Intended Learning Outcomes (ILOs):

Field	Program ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	**A-1** Theories and basics related to learning field, as well as other related fields.	**a1-3** Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Public Work Engineering.
	A-6 Basics and ethics of scientific research	**a6-1** Recognize Basics and ethics of scientific research.
Intellectual skills	**B-2** Solve specialized problems even with lack of some data and variables, (incomplete data).	**b2-1** Apply broad knowledge of modern computational methods and think critically to solve unstructured problems (with incomplete data) related to civil engineering.
	B-3 Link and integrate diverse knowledge to solve professional problems	**b3-2** Use integrated approaches to solve problems scientifically.
Professional skills	**C-3** Evaluate means and tools available in the field of practice	**c3-1** Evaluate methods and tools reported in a specified published articles and researches concerning to civil engineering field.
General skills	**D-2** Use information technology to improve his/her professional practice.	**d2-1** Use state-of-the-art computer design tools and applications for solving civil engineering problems.

4- Course Contents

Week No.	*Topic*	*Total Hours*	*Contact hrs*			*Course ILOs Covered(By No.)*
			Lec.	**Tut.**	**Lab.**	
Week(1-2)	Understanding Construction planning and organizations	3	3			**a1-3, a6-1**
Week(3-4)	Understanding planning techniques	3	3			**a1-3, a6-1 , b2-1**
Week(5-6)	Understanding check list	3	3			**a6-1 , b2-1, b3-2**
Week(7-9)	Understanding S-curve	3	3			**a6-1 , b2-1, b3-2**
Week(10-11)	Understanding CPM and PERT	3	3			**b2-1, b3-2, c3-1**
Week(12-13)	Understanding resource allocation and leveling	3	3			**c3-1 ,** d2-1

5- Relationship between the course and the program

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contribute in achieving	**a1& a6**	**b2 & b3**	**c3**	**d2**

6- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
----	**5%**	**50 %**	**10%**	**---**	**30%**	**5%**	**100%**

7- Course Topics.

Topic No.	Topic	Weeks
1st	Understanding Construction planning and organizations	**1-3**
2nd	Understanding planning techniques	**4-7**
3rd	Understanding check list	**8-10**
4th	Understanding S-curve	**10-14**
5th	Understanding CPM and PERT	**15-24**
6th	Understanding resource allocation and leveling	**25-30**

8- ILOs Matrix Topics

Course Intended Learning Outcomes (ILOs)		Course topics					
		1st	2nd	3rd	4th	5th	6th
Knowledge & Understanding	**a-1** Theories and basics related to learning field, as well as other related fields.	x			**x**	**x**	**x**
	a-6 Basics and ethics of scientific research	**x**			**x**	**x**	**x**
Intellectual Skills	**b-2** Solve specialized problems even with lack of some data and variables, (incomplete data).		**x**	**x**	**x**		
	b-3 Link and integrate diverse knowledge to solve professional problems		**x**	**x**	**x**		
Professional Skill	**c-3** Evaluate means and tools available in the field of practice		**x**	**x**	**x**		
General Skills	**d-2** Use information technology to improve his/her professional practice.					x	x

9- Teaching and Learning Method:

Course Intended Learning Outcome (ILOs)		Teaching and Learning Method:												
		Lecture	Presentation and Movies	Discussion	Tutorial	Problem solving	Brain storming	Projects	Site visits	Self-learning	Cooperative	Discovering	Modeling	Playing
A- Knowledge& Understanding	a1-3	x		x										
	a6-1	x		x										
B-Intellectual Skills	b2-1	x		x										
	b3-2	x		x										
C-Professional Skills	c3-1	x		x				x						
D-General Skills	d2-1	x		x				x						

10- Teaching and learning method for low capacity and outstanding Student

For low capacity students	Assign a portion of the office hours for those students.
	Give them specific tasks.
	Repeat the explanation of some of the material and tutorials.
	Assign a teaching assistance to follow up the performance of this group of students.
For outstanding Students	Hand out project assignments to those students.
	Give them some research topics to be searched using the internet and conduct presentation.
	Encourage them to take parts in the running research projects.

11- Assessment:

11.1 Assessment Methods

Course Intended Learning Outcome (ILOs)		Assessment Methods											
		Written Exam	Oral Exam	Tutorial Assessment	Project Assessment	Model Assessment	Report Assessment	Quiz assessment	Presentation Assessment	Discussion	Laboratory Test	Sketching drawings	Monitoring
A- Knowledge& Understanding	a1-3	x											
	a6-1	x											
B-Intellectual Skills	b2-1	x											
	b3-2	x											
C-Professional Skills	c3-1	x								x			
D-General Skills	d2-1	x						x					

11.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final examination		
Mid-term written examination		
End of term laboratory examination		
Tutorial and report assessment		
Total	100%	

12- Facilities required for teaching and learning

A. **Laboratory Usage:**

B. **Library Usage:**

Students should be encouraged to use library technical resources in the preparation of reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

13- List of references:

1- Graham M. Winch, Management Construction Projects, 2nd ed. 2010.
2- Sidney M.levy, Project Management in Construction, 1st ed. 2002.
3- GEORGE j. RITZ , Total Construction Project Management,1993.

Course Prof:

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

Date: 8/2019

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019/2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title: Construction Econimics	**Code Symbol**: **CES 529**	
Lecture	2 hours	
Tutorial / Laboratory	1	
Total	3 hours	Bylaw 2003

B- Professional Information

1- Course Aims:

Construction Economics provides students with the principles and concepts underlying the relationship between economic theory and the construction industry. The new approach adopts an argument that economics is central to government initiatives concerning sustainable construction. This course is designed to extend basic concepts learned in Construction Economics. For those students who look toward an industrial position after graduation, this course is designed to widen background in Construction Economics. This course will also provides an excellent opportunity to prepare the graduates for advanced study in a variety of different areas of civil engineering and material science. This course has been expanded to include the latest debates regarding the private finance initiative, value management, off-site manufacture and sustainable construction. This course provides revised data, examples, key readings, and updated glossary and references.

The main Objectives of this course are to equip the students with:

1. Knowledge and understanding of key and advanced facts, theories, concepts, principles and techniques relevant to Construction Economics.
2. Advanced skills in the definition, analysis, and solving of problems related to Construction Economics.
3. The ability to extend knowledge and develop models and methods and use techniques, principles and laws of engineering science in order to lead to engineering applications design using Construction Economics.
4. The ability to deal effectively with classical and modern theories to identify/solve complex and open-ended engineering problems related to Construction Economics.
5. Identify current problems and find solutions for it in the area of Construction Economics.

6. Awareness of the need to develop him/her self and to engage in continuous learning in the field of Construction Economics.
7. Application of specialized knowledge and combining it with relevant knowledge in his / her professional practice in the area of Construction Economics.

2- Intended Learning Outcomes (ILOs) for the whole program

This course is designed to achieve the above objectives through the following Intended **Learning Outcomes (ILOs)**:

NAQAAE Academic Reference Standards (ARS)	Program ILOs	Course ILOs
A. Knowledge and understanding		
A1- Theories, basics and specialized knowledge in the field of learning, as well as the subjects that affect his/her professional practice.	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of **Structural Engineering**.	a1-1-1 Recognize the main structure concepts of the most common construction materials. a1-1-2 Classify the construction materials according to their physical structure and properties. a1-1-3 Describe the economic systems for resource allocation. a1-1-4 Recognize and analyze the market mechanism. a1-1-5 Know the Theory of Demand and the Theory of Supply. a1-1-6 Manage the relationship between clients and contractors. a1-1-7 Analyze costs of the construction firm. a1-1-8 Be aware of types of market structure in the Construction Industry.
A3- Basics and principles of quality in professional practice in the field of specialization.	a3-1 Explain Quality Assurance concepts of different civil engineering disciplines and systems development phases.	a3-1-1 Report and discuss social effects of civil engineering materials applications.
A4- Mutual relation between professional aspects of professional practice and its effects on the Environment.	a4-1 Discuss the effects of civil engineering technologies on the surrounding environment.	a4-1-1 Report and recognize the professional aspects of civil engineering materials applications and their effects on the Environment. a4-1-2 Markets for Green Buildings and Infrastructure.

		a4-1-3 Enhance and spread the idea of environmental economics.
B. Intellectual skills		
B3- Analytically read researches and subjects relevant to the field of specialization.	b3-1 Analyze, interpret and manipulate data from a variety of sources and researches.	b3-1-1 Analyze, interpret and manipulate data from a variety of sources and relate it to solve professional problems related to civil engineering materials and its applications in construction economics.
C. Professional and practical skills		
C1- Apply professional skills in the field of specialization.	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.	c1-1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions related to construction economics problems, using latest engineering techniques, skills, and tools.
C2- Write professional reports.	c2-1 Write and evaluate a professional report on specialized systems related to civil engineering technical matters.	c2-1-1 Write and evaluate a professional report on construction economics.
D. General and transferrable skills		
D2- Use information technology to improve his/her professional practice	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems.	d2-1-1 Use state-of-the-art computer aided design tools for solving professional problems related to construction economics.
D4- Use different resources to obtain knowledge and information.	d4-1 Use different resources of information like libraries, internet access facilities, etc. to upgrade and enhance their conceptual knowledge.	d4-1-1 Use different sources of information like library, internet access facilities, etc. to upgrade and enhance their conceptual knowledge about construction economics.
D7- Learn independently and seek continuous learning.	d7-2 Seek continuous learning through continuous education, organizing and participating in seminars, workshops, national and international conferences.	d7-2-1 Exhibit the ability to learn more about construction economics.

3- Course Contents

Lecture Topic	Total Hours	Lec. Hours	Tut. Hours	ILOs covered (By No.)
1- Economic Systems for Resource Allocation.	6	4	2	a1-1-1, a1-1-2, a1-1-3, a3-1-1, b3-1-1
2- The Market Mechanism.	6	4	2	a1-1-1, a1-1-2, a1-1-4, a3-1-1, c1-1-1
3- The Theory of Demand and Supply.	6	4	2	a1-1-1, a1-1-2, a1-1-5, b3-1-1
4- Clients and Contractors.	6	4	2	a1-1-1, a1-1-2, a1-1-6, c2-1-1
5- Costs of the Construction Firm.	6	4	2	a1-1-1, a1-1-2, a1-1-3, a1-1-7, b3-1-1, d4-1-1
6- Types of Market Structure in the Construction Industry.	6	4	2	a1-1-1, a1-1-2, a1-1-3, a1-1-8, c1-1-1, d2-1-1
7- Markets for Green Buildings and Infrastructure And Environmental Economics.	6	4	2	a1-1-1, a1-1-2, a4-1-1, a4-1-2, a4-1-3
8- Market Failure and Government Intervention.	12	8	4	a1-1-1, a1-1-2, a1-1-3
9- Managing the Macro-economy.	12	8	4	a1-1-1, a1-1-2, d2-1-1
10- The Economy and Construction: Measurement and Manipulation.	6	4	2	a1-1-1, a1-1-2, d4-1-1
11- The Business Case: Inflation and Expectations.	12	8	4	a1-1-1, a1-1-2, d7-1-1
Total	**84**	**56**	**28**	**--**

4- Relationship between the course and the program

Field	Academic Reference Standard (ARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills

Program Academic Standards that the course contributes in achieving.	A1 (a1-1), A23 (a3-1), A4 (a4-1)	B3 (b3-1)	C1 (c1-1), C2 (c2-1)	D2 (d2-1), D4 (d4-1), D7 (d7-2)

5- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
---	10%	30%	60%	10%	---	---	100 %

6- Course Topics.

Topic No.	Topic	Weeks
1st	Economic Systems for Resource Allocation.	1-2
2nd	The Market Mechanism.	3-4
3rd	The Theory of Demand and Supply.	5-6
4th	Clients and Contractors.	7-8
5th	Costs of the Construction Firm.	9-10
6th	Types of Market Structure in the Construction Industry.	11-12
7th	Markets for Green Buildings and Infrastructure And Environmental Economics.	13-14
8th	Market Failure and Government Intervention.	15-18
9th	Managing the Macro-economy.	19-22
10th	The Economy and Construction: Measurement and Manipulation.	23-24
11th	The Business Case: Inflation and Expectations.	25-28

7- ILOs Matrix Topics

Course topics	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**7th**	**8th**	**9th**	**10th**	**11th**

Course ILOs	Knowledge & Understanding										
a1-1-1 Recognize the main structure concepts of the most common construction materials.	x	x	x	x	x	x	x	x	x	x	x
a1-1-2 Classify the construction materials according to their physical structure and properties.	x	x	x	x	x	x	x	x	x	x	x
a1-1-3 Describe the economic systems for resource allocation.	x				x	x		x			
a1-1-4 Recognize and analyze the market mechanism.		x									
a1-1-5 Know the Theory of Demand and the Theory of Supply.			x								
a1-1-6 Manage the relationship between clients and contractors.				x							
a1-1-7 Analyze costs of the construction firm.					x						
a1-1-8 Be aware of types of market structure in the Construction Industry.						x					
a3-1-1 Report and discuss social effects of civil engineering materials applications.	x	x	x								
a4-1-1 Report and recognize the professional aspects of civil engineering materials applications and their effects on the Environment.							x				
a4-1-2 Markets for Green Buildings and Infrastructure.							x				
a4-1-3 Enhance and spread the idea of environmental economics.							x				
Course ILOs	**Intellectual Skills**										
b3-1-1 Analyze, interpret and manipulate data from a variety of sources and relate it to solve professional problems related to civil engineering materials and its applications in construction economics.	x				x						
Course ILOs	**Professional Skill**										
c1-1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions related to construction		x				x					

economics problems, using latest engineering techniques, skills, and tools.											
c2-1-1 Write and evaluate a professional report on construction economics.				x							
Course ILOs	General Skills										
d2-1-1 Use state-of-the-art computer aided design tools for solving professional problems related to construction economics.						x			x		
d4-1-1 Use different sources of information like library, internet access facilities, etc. to upgrade and enhance their conceptual knowledge about construction economics.					x					x	
d7-2-1 Exhibit the ability to learn more about construction economics.											x

8- Teaching and Learning Method:

Course Intended learning outcomes (ILOs)		Teaching and Learning Method												
		Lecture	Presentation and Movies	Discussion	Tutorial	Problem solving	Brain storming	Projects	Report	Self learning	Cooperative	Discovering	Computer Simulation	Practical Experiments
Knowledge & understanding	a1-1-1	x			x	x								
	a1-1-2	x			x	x								
	a1-1-3	x			x	x								
	a1-1-4	x			x	x								
	a1-1-5	x			x	x								
	a1-1-6	x			x	x								
	a1-1-7	x			x	x	x							
	a1-1-8	x					x			x				
	a3-1-1	x			x	x								
	a4-1-1	x			x	x								
	a4-1-2	x	x	x					x	x				
	a4-1-3	x	x	x					x	x				
Intellectual Skills	b3-1-1	x			x	x	x							
Professional	c1-1-1	x			x	x								

Skills	c2-1-1	x	x	x					x	x				
General Skills	d2-1-1	x											x	
	d4-1-1	x	x							x				
	d7-1-1	x	x							x				

9- Assessment

9.1 Assessment Methods

Final Written Examination : to assess students' knowledge, understanding, analysis, creativity, problem solving, and problem identification.

9.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final Examination	100	32
Total	100%	

10- Facilities required for teaching and learning

Blackboard – Class Room Equipped with Computer and Video Projector - Computer Lab with Preinstalled PRIMAVERA software package (last version) - Library.

A. laboratory Usage:

Students are expected to prepare and conduct some computer simulation assignments using PRIMAVERA simulators using general computer labs.

B. Library Usage:

Students should be encouraged to use library technical resources in the preparation of laboratory reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

11- List of References:

Course and Lab Notes:

No lectures and Labs notes.

Essential Books (Text Books):

- Danny Myers " Construction Economics A new approach", Taylor & Francis, Second Edition, 2008.
- Gerard De Valence "Modern Construction Economics, Theory and Application ", Spon Press, 2011.

12- Program Coordination Committee:

Course Coordinator: **Dr. Tarek Sharaf**

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

Date: 8/2019

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019/2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title: Construction Equipment	**Code Symbol: CES530**	
Lecture	2	
Tutorial	**1**	
Laboratory	**0**	
Total	3	Bylaw 2000
First term	prerequisite	

B- Professional Information

1- Course Aims:

This course introduces the basic concepts of Construction Equipment for the civil engineers. The basics of Construction Equipment Projectsare well studied.

2- Course Objectives

By the end of the course the students will be able to:

- Understanding the main concept Construction Projects.
- Understanding planning Construction Projects.
- Understanding importance of Construction Equipment in Construction Projects.

3- Intended Learning Outcomes (ILOs):

Field	Program ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	**A-5** Methodologies of solving engineering problems, data collection and interpretation.	**a-5-1** Define the Methodologies of solving engineering problems
	A-6 Professional ethics and impacts of engineering solutions on society and environment.	**a-6-1** Describe the ethics and impacts of engineering solutions on society and environment.
Intellectual skills	**B-2** Select appropriate solutions for engineering problems based on analytical thinking.	**b-2-1** Use the appropriate solution for engineering problems
	B-3 Think in a creative and innovative way in problem solving and design.	**b-3-1** Analyze the problem and find a creative solution.
Professional skills	**C-3** Apply numerical modeling methods to engineering problems.	**c-3-1** Analyze the problem into points to determine the solution.
General skills	**D-2** Work in stressful environment and within constraints.	**d-2-1** Describe the stressful environment in construction projects and how to solve any problems at this environment

4- Course Contents

Week No.	*Topic*	*Total Hours /week*	*Contact hrs*			*Course ILOs Covered(By No.)*
			Lec.	**Tut.**	**Lab.**	
Week(1-6)	Major mechanical operations, earth moving equipment	3	2	1		**a-5**
Week(7-12)	hoisting equipment, conveying, pumping batching plant	3	2	1		**a-6**
Week(13-19)	pile driving planning and selection of equipment,	3	2	1		**b-2**
Week(20-23)	production estimates, sizing, economics of construction equipment	3	2	1		**d-2**
Week(24-27)	Preventive maintenance and repairs	3	2	1		**b-3**
Week(28-30)	systems approach to planning and applications.	3	2	1		**c-3**

5- Relationship between the course and the program

Field	National Academic Reference Standard(ARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contribute in achieving	**a5& a6**	**b2 & b3**	**c7**	**d2**

6- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
----	**5%**	**50 %**	**10%**	**---**	**30%**	**5%**	**100%**

7- Course Topics.

Topic No.	Topic	Weeks
1st	Major mechanical operations, earth moving equipment	*Week(1-6)*
2nd	hoisting equipment, conveying, pumping batching plant	*Week(7-12)*
3rd	pile driving planning and selection of equipment,	*Week(13-19)*
4th	production estimates, sizing, economics of construction equipment	*Week(20-23)*
5th	Preventive maintenance and repairs	*Week(24-27)*
6th	systems approach to planning and applications.	*Week(28-30)*

8- ILOs Matrix Topics

Course Intended Learning Outcomes (ILOs)		Course topics					
		1st	2nd	3rd	4th	5th	6th
Knowledge & Understanding	**a-5-1** Define the Methodologies of solving engineering problems	x	**x**				
	a-6-1 Describe the ethics and impacts of engineering solutions on society and environment.			**x**			**x**
Intellectual Skills	**b-2-1**Use the appropriate solution for engineering problems		x				
	b-3-1 Analyze the problem and find a creative solution.			X	x	x	x
Professional Skill	**c-3-1**Analyze the problem into points to determine the solution.				x	x	x
General Skills	**d-2-1**Describe the stressful environment in construction projects and how to solve any problems at this environment					x	x

9- Teaching and Learning Method:

Course Intended Learning Outcome (ILOs)		Teaching and Learning Method:												
		Lecture	Presentation and Movies	Discussion	Tutorial	Problem solving	Brain storming	Projects	Site visits	Self learning	Cooperative	Discovering	Modeling	Playing
A- Knowledge& Understanding	a5-1	x		x										
	a6-2	x		x										
B-IntellectualSkills	b2-1	x		x										
	b3-1	x		x										
C-Professional Skills	c7-1	x		x				x						
D-General Skills	d2-1	x		x				x						

10- Teaching and learning method for low capacity and outstanding Student

For low capacity students	Assign a portion of the office hours for those students.
	Give them specific tasks.
	Repeat the explanation of some of the material and tutorials.
	Assign a teaching assistance to follow up the performance of this group of students.
For outstanding Students	Hand out project assignments to those students.
	Give them some research topics to be searched using the internet and conduct presentation.
	Encourage them to take parts in the running research projects.

11- Assessment:

11.1 Assessment Methods

Course Intended Learning Outcome (ILOs)		Assessment Methods											
		Written Exam	Oral Exam	Tutorial Assessment	Project Assessment	Model Assessment	Report Assessment	Quiz assessment	Presentation Assessment	Discussion	Laboratory Test	Sketching drawings	Monitoring
A- Knowledge& Understanding	a5-1	x											
	a6-2	x											
B-IntellectualSkills	b2-1	x											
	b3-1	x											
C-Professional Skills	c7-1	x								x			
D-General Skills	d2-1	x						x					

11.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final examination	100%	32
Mid-term written examination	--------	
End of term laboratory examination	--------	
Tutorial and report assessment	-------	
Total	100%	

12- Facilities required for teaching and learning

A. **Laboratory Usage:**

B. **Library Usage:**

Students should be encouraged to use library technical resources in the preparation of reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

13- List of references:

1- Egyptian code of practice
2- Abdelrahim, Kh. D (2009) (Steel structures design- allowable stress design)
3- Buick D (designer manual)

Course Prof: **Dr .Tarek Selim**

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

Date: 8/2019

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019/2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title: Application of computer science in Hydraulics	**Code Symbol: CES 531**	
Lecture	**3 hours**	
Tutorial / Laboratory	**--**	
Total	**3 hours**	**By law 2003**

B- Professional Information

1- Course Aims:

This course covers the development of written specifications and the implications of different contractual arrangements. Topics include specification development, contracts, bidding material research, and agency responsibilities. Upon completion, students should be able to write a specification section and demonstrate the ability to interpret contractual responsibilities

.The main Objectives of this course are to equip the students with:

1. Read and interpret construction contracts.
2. Identify the elements of an enforceable contract.
3. Write a specification section and demonstrate the ability to interpret contractual responsibilities

2- Intended Learning Outcomes (ILOs)

NAQAAE Academic Reference Standards (ARS)	Program ILOs	Course ILOs
A. Knowledge and understanding		
A1. Theories, basics and specialized knowledge in the field of learning, as well as the subjects that affect his/her professional practice.	a1-3 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of **Public Work Engineering**.	a1-3 Discuss bid form ,bidding document and bills of quantity.
B. Intellectual skills		
B1- Analyze and evaluate the information in the field of specialization, and solve the problems based on that. .	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.	b1-1 Discuss and interpret construction contracts.
C. Professional and practical skills		
C2- Write and evaluate technical and professional reports.	C2-1 Write and evaluate a professional report on specialized systems related to civil engineering technical matters.	C2-1 Discuss a specification section and demonstrate the ability to interpret contractual responsibilities.
D. General and transferrable skills		
D2- Use information technology to improve his/her professional practice.	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems	d2-1 Use state-of-the-art computer and Internet tools for getting latest information and standards.

3- Course Contents

Topic	*Total Hours*	*Contact hrs*			*Course ILOs Covered (By No.)*
		Lec.	Tut.	Lab.	
1- Preparation of bids	12	8	4	--	a1-3, b1-1, c2-1 ,d2-1
2- tendering documents	12	8	4	--	a1-3, b1-1, c2-1 ,d2-1
3- tendering documents	12	8	4	--	a1-3, b1-1, c2-1 ,d2-1
4- sub contracting	12	8	4	--	a1-3, b1-1, c2-1 ,d2-1
5- insurance and quality assurance	12	8	4	--	a1-3, b1-1, c2-1 ,d2-1
6- claims, arbitration	12	8	4	--	a1-3, b1-1, c2-1 ,d2-1
Total	72	48	24	--	

4- Relationship between the course and the program

Field	Academic Reference Standard(ARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contribute in achieving	A1(a1-3)	B1(b1-1),	C2(c2-1)	D2(d2-1)

5- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Discretionry subjects	Total
---	---	---	---	20%	80%	---	100%

6- Course Topics.

Topic No.	Topic	Weeks
1st	Preparation of bids	1-4
2nd	tendering documents	5-8
3rd	tendering documents	9-12
4th	sub contracting	13-16
5th	insurance and quality assurance	17-19
6th	claims, arbitration	20-30

7- ILOs Matrix Topics

Course topics	1st	2nd	3rd	4th	5th	6th
Course ILOs	Knowledge & Understanding					
a3-1 Discuss bid form ,bidding document and bills of quantity.	x	x	x	x	x	x
Course ILOs	Intellectual skills					
b1-1 Discuss and interpret construction contracts.	x	x	x	x	x	x
Course ILOs	Professional and practical skills					
C2-1 Discuss a specification section and demonstrate the ability to interpret contractual responsibilities.	x		x	x	x	x
Course ILOs	General and transferrable skills					
d2-1 Use state-of-the-art computer and Internet tools for getting latest information and standards.	x		x	x	x	x

8- Teaching and Learning Method:

Course Intended learning outcomes (ILOs)		Teaching and Learning Method												
		Lecture	Presentation and	Discussion	Tutorial	Problem solving	Brain storming	Projects	Report	Self learning	Cooperative	Discovering	Computer Simulation	Practical Experiments
Knowledge & understanding	a3-1	x				x								
Intellectual Skills	b3-1		x											
Professional Skills	C2-1		x											
General Skills	d2-1												x	

9- Assessment

9.1 Assessment Methods

Final Written Examination : to assess students' knowledge, understanding, analysis, creativity, problem solving, and problem identification.

9.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final Examination	100	32
Total	100%	

10- Facilities required for teaching and learning

Class Room Equipped with Computer and Video Projector - Computer Lab with Preinstalled MATLAB software package (last version) - Library.

A. laboratory Usage:

Students are expected to prepare and conduct some computer simulation assignments using digital systems simulators on general computer labs.

B. Library Usage:

Students should be encouraged to use library technical resources in the preparation of laboratory reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

11- List of references:

1. العقود والمواصفات للمنشات الهندسية - ا.د محمدعبد الحميد جودة
2. المواصفات القياسية المصرية
3. العقود الهندسية المحلية والدولية - المهندس الاستشاري محمدماجد خلوصي
4. قانون رقم ٨٩ لسنة ١٩٩٨ بشان المناقصات والمزايدات ولائحته التنفيذية

12- Program Coordination Committee:

Course Coordinator: **Dr moustafa marzouck**

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

Date: 8/2019

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019/2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title: Resources Management	**Code Symbol: CES 532**	
Lecture	**3 hours**	
Tutorial / Laboratory	**--**	
Total	**3 hours**	**By law 2003**

B- Professional Information

1- Course Aims:

This course is designed to extend basic concepts learned of essential knowledge and information for Resources Management, Material management concepts. Also it aims to Studying human resources management. The course provides the student to recognize the site management. For those students who look toward Management position after graduation, this course is designed to widen background in this field. This course will also provide an excellent opportunity to prepare the graduates for advanced study in information system, team organization. The course is meant to create the deep understanding of the basics and theories behind recruiting and training, incentives, labor relation, costs, reporting.

The main Objectives of this course are to equip the students with:

1. Recognize Material management and human resources management.
2. Recognize site management, information system.

3. How to construct team organization.
4. Recognize recruiting and training, incentives, labor relation, costs, reporting.

2- Intended Learning Outcomes (ILOs)

NAQAAE Academic Reference Standards (ARS)	Program ILOs	Course ILOs
A. Knowledge and understanding		
A1. A1. Theories, basics and specialized knowledge in the field of learning, as well as the subjects that affect his/her professional practice.	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Structural Engineering.	a1-1 Deterministic and stochastic Material management.
	a1-3 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Public Work Engineering.	a1-3 Site management
B. Intellectual skills		
B1- Analyze and evaluate the information in the field of specialization, and solve the problems based on that.	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.	b1-1 Demonstrate an investigatory and analytic thinking approach to solve the costs.
B2- Solve specialized problems even with lack of some data and variables, (incomplete data).	b2-1 Apply broad knowledge of modern computational methods and think critically to solve unstructured problems (with incomplete data) related to civil engineering.	b2-1 Apply broad knowledge of modern computational methods to solve information systems.
C. Professional and practical skills		
C2- Write and evaluate	c.2-1 Write and evaluate a	c2-1 Write and evaluate a reporting.

technical and professional reports.	professional report on specialized systems related to civil engineering technical matters.	
D. General and transferrable skills		
D5- Work in a team and lead teams in familiar professional context	d5-1 Practicing team work in specified professional jobs.	d5-1 team organization

3- Course Contents

Topic	*Total Hours*	*Contact hrs*			*Course ILOs Covered (By No.)*
		Lec.	Tut.	Lab.	
1. Material management.	12	8	4	--	a1-1 , b1-1, c2-1, d5-1
2. Human resources management.	12	8	4	--	a1-1,a1-3, c2-1, d5-1,b2-1
3. Site management.	24	16	8	--	a1-1, a1-3, b2-1, b1-1, c2-1, d5-1
4. Information system.	12	8	4	--	a1-1, a1-3, b1-1, b2-1, c2-1, d5-1
5. Team organization.	12	8	4	--	d5-1, a1-1, a1-3, b1-1, b2-1, c2-1
6. Recruiting and training, incentives, labor relation, costs, reporting.	12	8	4	--	a1-1, a1-3, b1-1, c2-1,b2,1
Total	84	56	28	--	

4- Relationship between the course and the program

Field	Academic Reference Standard(ARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contribute in achieving	A1(a1-1,a1-3)	B1(b1-1) B2(b2-1)	C2(c2-1)	D5(d5-1)

5- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
15%	---	45%	15%	15%	10%		100%

6- Course Topics.

Topic No.	Topic	Weeks
1st	Material management.	1-4
2nd	Human resources management.	5-8
3rd	Site management.	9-16
4th	Information system.	17-21
5th	Team organization.	22-24
6th	Recruiting and training, incentives, labor relation, costs, reporting.	25-28

7- ILOs Matrix Topics

Course topics	1st	2nd	3rd	4th	5th	6th
Course ILOs	Knowledge & Understanding					
a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Structural Engineering.	x	x	x	x	x	x
a1-3 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of Public Work Engineering.		x	x	x	x	x
Course ILOs	Intellectual skills					

b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.		x	x	x	x	
b2-1 Apply broad knowledge of modern computational methods and think critically to solve unstructured problems (with incomplete data) related to civil engineering.		x	x	x	x	x
Course ILOs	Professional and practical skills					
c.2-1 Write and evaluate a professional report on specialized systems related to civil engineering technical matters.	x	x	x	x	x	x
Course ILOs	General and transferrable skills					
d5-1 Practicing team work in specified professional jobs.	x	x	x	x	x	

8- Teaching and Learning Method:

Course Intended learning outcomes (ILOs)		Teaching and Learning Method												
		Lecture	Presentation and Movies	Discussion	Tutorial	Problem solving	Brain storming	Projects	Report	Self learning	Cooperative	Discovering	Computer Simulation	Practical Experiments
Knowledge & understanding	a1-1	x				x								
	a1-3		x	x					x	x				
Intellectual Skills	b1-1		x											
	b2-1													
Professional Skills	c2-1		x											
General Skills	d5-1												x	

9- Assessment

9.1 Assessment Methods

Final Written Examination	:	To assess students' knowledge, understanding, analysis, creativity, problem solving, and problem identification.

9.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final Examination	100	32
Total	100%	

10- Facilities required for teaching and learning

Class Room Equipped with Computer and Video Projector - Library.

A. Library Usage:

Students should be encouraged to use library technical resources in the preparation of laboratory reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

11- List of references:

1- **Egyptian code of practice**
2- **Abdelrahim, Kh. D (2009) (Steel structures design- allowable stress design)**
3- **Buick D (designer manual)**

12- Program Coordination Committee:

Course Coordinator: **Dr. Mohamed Zaghlol**

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

Date: 8/2019

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019/2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title: Productivity in Construction Projects	**Code Symbol: CES 533**	
Lecture	2	
Tutorial	**1**	
Laboratory	**0**	
Total	3	Bylaw 2000
First term	prerequisite	

B- Professional Information

1- Course Aims:

This course introduces the basic concepts of Productivity in Construction Projects for the civilengineer. The basics of Productivity in Construction Projects are well studied.

2- Course Objectives

By the end of the course the students will be able to:

- Understanding the main concept Productivity in Construction Projects.
- Understanding planning of Construction Projects.
- Understanding importance of Productivity in Construction Projects.

3- Intended Learning Outcomes (ILOs):

Field	Program ILOs that the course contribute in achieving	Course ILOs
Knowledge& Understanding	**A-5**Methodologies of solving engineering problems, data collection and interpretation.	**a-5-1** Define the Methodologies of solving engineering problems
	A-3 Professional ethics and impacts of engineering solutions on society and environment.	**a-3-1**Describe the ethics and impacts of engineering solutions on society and environment.
Intellectual skills	**B-2** Select appropriate solutions for engineering problems based on analytical thinking.	**b-2-1**Use the appropriate solution for engineering problems
	B-3 Think in a creative and innovative way in problem solving and design.	**b-3-1** Analyze the problem and find a creative solution.
Professional skills	**C-1**Apply numerical modeling methods to engineering problems.	**c-1-1**Analyze the problem into points to determine the solution.
General skills	**D-2**Work in stressful environment and within constraints.	**d-2-1**Describe the stressful environment in construction projects and how to solve any problems at this environment

4- Course Contents

Week No.	*Topic*	*Total Hours*	*Contact hrs*			*Course ILOs Covered (By No.)*
			Lec.	**Tut.**	**Lab.**	
Week1-4	Factors affecting productivity	6	4	2		**a-5**
Week5-8	productivity, productivity engineering and management	6	4	2		**a-3**
Week9-12	Productivity measurement	6	5	1		**b-2**
Week13-16	work study, method study	6	5	1		**d-2**

Week17-21	***Midterm written examination***					
Week22-25	total productivity	6	4	2		**b-3**
Week26-30	Productivity improvement techniques.	6	5	1		**c-1**

5- Relationship between the course and the program

Field	**National Academic Reference Standard(NARS)**			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contribute in achieving	**a5& a3**	**b2 & b3**	**c1**	**d2**

6- Course Subject Area:

A	**B**	**C**	**D**	**E**	**F**	**G**	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
----	**5%**	**50 %**	**10%**	**---**	**30%**	**5%**	**100%**

7- Course Topics.

Topic No.	**Topic**	**Weeks**
1st	Factors affecting productivity	**1-4**
2nd	productivity, productivity engineering and management	**5-8**
3rd	Productivity measurement	**9-12**
4th	work study, method study	**13-16**
5th	total productivity	**17-21**
6th	Productivity improvement techniques.	**22-30**

8- ILOs Matrix Topics

Course Intended Learning Outcomes (ILOs)		Course topics					
		1st	2nd	3rd	4th	5th	6th
Knowledge & Understanding	**a-5-1** Define the Methodologies of solving engineering problems	x	**x**				
	a-3-1 Describe the ethics and impacts of engineering solutions on society and environment.			**x**			**x**
Intellectual Skills	**b-2-1**Use the appropriate solution for engineering problems		x				
	b-3-1 Analyze the problem and find a creative solution.			X	x	x	x
Professional Skill	**c-1-1** Analyze the problem into points to determine the solution.				x	x	x
General Skills	**d-2-1**Describe the stressful environment in construction projects and how to solve any problems at this environment					x	x

9- Teaching and Learning Method:

Course Intended Learning Outcome (ILOs)		Teaching and Learning Method:												
		Lecture	Presentation and Movies	Discussion	Tutorial	Problem solving	Brain storming	Projects	Site visits	Self-learning	Cooperative	Discovering	Modeling	Playing
A- Knowledge& Understanding	a5-1	x		x										
	a3-2	x		x										
B-IntellectualSkills	b2-1	x		x										
	b3-1	x		x										
C-Professional Skills	c1-1	x		x				x						
D-General Skills	d2-1	x		x				x						

10- Teaching and learning method for low capacity and outstanding Student

For low capacity students	Assign a portion of the office hours for those students.
	Give them specific tasks.
	Repeat the explanation of some of the material and tutorials.
	Assign a teaching assistance to follow up the performance of this group of students.
For outstanding Students	Hand out project assignments to those students.
	Give them some research topics to be searched using the internet and conduct presentation.
	Encourage them to take parts in the running research projects.

11- Assessment:

11.1 Assessment Methods

Course Intended Learning Outcome (ILOs)		Assessment Methods											
		Written Exam	Oral Exam	Tutorial Assessment	Project Assessment	Model Assessment	Report Assessment	Quiz assessment	Presentation Assessment	Discussion	Laboratory Test	Sketching drawings	Monitoring
A- Knowledge& Understanding	a5-1	x											
	a3-2	x											
B-IntellectualSkills	b2-1	x											
	b3-1	x											
C-Professional Skills	c1-1	x								x			
D-General Skills	d2-1	x						x					

11.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final examination	70%	
Mid-term written examination	20%	
End of term laboratory examination	--------	
Tutorial and report assessment	10%	
Total	100%	

12- Facilities required for teaching and learning

A. **Laboratory Usage:**

B. **Library Usage:**

Students should be encouraged to use library technical resources in the preparation of reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

13- List of references:

1- Egyptian code of practice
2- Abdelrahim, Kh. D (2009) (Steel structures design- allowable stress design)
3- Buick D (designer manual)

Course Prof: **Prof .Dr. Mamdouh Salah**

Dr . Tarek Selim

Program coordinator: **Dr. Ahmed Turk**

Head of the Department: **Prof. Dr. Mamdouh Salah**

Date: 8/2019

Course Specification

Program on which the course is given	Civil Engineering
Major or minor element of program	Major
Department offering the program	Civil Engineering
Department offering the course	Civil Engineering
Academic year/Level	2019/2020 M.Sc. and Diploma
Date of specification approval	2019

A- Basic Information

Title: Accounting and Costing	**Code Symbol: CES 534**	
Lecture	**2 hours**	
Tutorial / Laboratory	**1 hours**	
Total	**3 hours**	**By law 2000**

B- Professional Information

1- Course Aims:

This course aims, in general, to activate the student knowledge and understanding in the direction of implementing Accounting and Costing topics. Having learned his/her basic Accounting and Costing in previous courses, the student is subjected in this course to six main topics in this course. These topics are: Accounting principles, Definition of unified accounting system, accounting systems for contracting, Planning budgets, Costings and Cost elements and Cost centers and profit centers. During the course, the student is trained on several problems, understand the basics of each topic to make sure of his/her capability to face the profession and to be capable of evaluating Accounting and Costing problems and use his information in solving field problems.
The main Objectives of this course are to equip the students with:

1- Demonstration of the knowledge and understanding the Accounting principles.
2- Demonstration of the knowledge and understanding the Definition of unified accounting system.
3- Demonstration of the knowledge and understanding the Accounting systems for contracting.
4- Demonstration of the knowledge and understanding the Planning budgets.

5- Demonstrate the knowledge and understanding The Costings and Cost elements and Cost centers and profit centers.

2- Intended Learning Outcomes (ILOs)

NAQAAE Academic Reference Standards (ARS)	Program ILOs	Course ILOs
A. Knowledge and understanding		
A1. Theories and basics related to learning field, as well as other related fields.	a1-1 Demonstrate sufficient essential knowledge and a deep understanding of the theories, basics and specialized knowledge in the field of structural Engineering.	a1-1 Describe the principles of Accounting.
B. Intellectual skills		
B1- Analyze and evaluate the information in the field of specialization, and solve the problems based on that. .	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.	b1-1 Describe the Definition of unified accounting system.
C. Professional and practical skills		
C1- Mastering the basics as well as the latest professional skills in the field of specialization.	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.	c1-1 Describe the Accounting systems for contracting. .
D. General and transferrable skills		
D2- Use information technology to improve his/her professional practice.	d2-1 Use state-of-the-art computer design tools and applications for solving civil engineering problems	d2-1 Express to monitor and evaluate Planning budgets, The Costings and Cost elements and Cost centers and profit centers.

3- Course Contents

Topic	*Total Hours*	*Contact hrs*			*Course ILOs Covered (By No.)*
		Lec.	Tut.	Lab.	
1- the Accounting principles.	18	12	6	--	a1-1, b1-1,c1-1
2- the Definition of unified accounting system.	18	12	6	--	a1-1, b1-1, c1-1, d2-1
3- the Accounting systems for contracting.	18	12	6	--	c1-1, d2-1
4- the Planning budgets.	18	12	6	--	a1-1, b1-1, c1-1
5- The Costings and Cost elements and Cost centers and profit centers.	12	8	4	--	a1-1, b1-1, c1-1, d2-1
Total	84	56	28	--	

4- Relationship between the course and the programme

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Programme Academic Standards that the course contribute in achieving	A1(a1-1)	B1(b1-1)	C1(c1-1)	D2(d2-1)

5- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
---	---	20%	10%	70%			100%

6- Course Topics.

Topic No.	Topic	Weeks
1st	the Accounting principles.	1-6
2nd	the Definition of unified accounting system.	7-12
3rd	the Accounting systems for contracting.	13-18
4th	the Planning budgets.	19-24
5th	The Costings and Cost elements and Cost centers and profit centers.	25-28

7- ILOs Matrix Topics

Course topics	1st	2nd	3rd	4th	5th
Course ILOs	Knowledge & Understanding				
a1-1 Describe the principles of High speed trains.	x		x	x	x
Course ILOs	Intellectual skills				
b1-1 Design the different types of non-ballasted track.	x	x	x	x	x
Course ILOs	Professional and practical skills				
c1-1 Describe the principles of railway track buckling.	x	x	x	x	x
Course ILOs	General and transferrable skills				
d2-1 Express to monitor and evaluate rail-road crossings.	x		x	x	x

8- Teaching and Learning Method:

Course Intended learning outcomes (ILOs)		Teaching and Learning Method												
		Lecture	Presentation and	Discussion	Tutorial	Problem solving	Brain storming	Projects	Report	Self learning	Cooperative	Discovering	Computer Simulation	Practical Experiments
Knowledge & understanding	a1-1	x				x								
Intellectual Skills	b1-1		x											
Professional Skills	c1-1		x											

General Skills	d2-1												x	

9- Assessment

9.1 Assessment Methods

Final Written Examination : to assess students' knowledge, understanding, analysis, creativity, problem solving, and problem identification.

9.2 Assessment Schedule and Grades Distribution

Assessment Method	Percentage	week
Final Examination	100	32
Total	100%	

10- Facilities required for teaching and learning

Class Room Equipped with Computer and Video Projector - Computer Lab with Preinstalled MATLAB software package (last version) - Library.

A. laboratory Usage:

Students are expected to prepare and conduct some computer simulation assignments using digital systems simulators on general computer labs.

B. Library Usage:

Students should be encouraged to use library technical resources in the preparation of laboratory reports and oral presentation. At least one oral presentation should involve a significant component of library research to encourage this component of study.

11- List of references:

11.1- Course Notes - Course Notes & CD , by course co-orinator.

12- Program Coordination Committee:

Course Coordinator: Dr. Eng. NourAllah Mohamed Hussein

Program coordinator: Dr. Ahmed Turk

Head of the Department: Prof. Dr. Mamdouh Salah

Date: 8/2019

Diploma Postgraduate

Specification For Project

CES P98

Course Specification

Program on which the course is given	Diploma Postgraduate in Civil engineering
Major or minor element of program	Major
Department offering the program	Civil engineering
Department offering the course	Civil engineering
Academic year/Level	Diploma Postgraduate 2019/2020
Date of specification approval	***2019***

A- Basic Information

Title:	**Code Symbol**: **CES P98**	
Lecture	Independent but regular contacts with the supervisor is required	
Tutorial / Laboratory	Independent	
Total		Bylaw 2000

B- Professional Information

1- Course Aims:

The Project Course is an independent project (degree project) to develop and display the skills and abilities of the student to carry out individual, independent scientific work on a specific topic, exploring it in a trans-disciplinary manner, and assessing solutions and conclusions with respect to the different dimensions of sustainability. It does not aim to provide additional substantive material or methodological toolkit, the way typical graduate courses do. Its goal is rather modest as it attempts to apply student cumulative understanding and skills to specific research situation. From the perspective of one's program of study, however, the course phase poses a real-world test helping to make a realistic transition from coursework to dissertation. Completing a dissertation successfully is the last and often most challenging part of master studies. The goal is to put one's theoretical knowledge and research proficiency to practical test by carrying out an independent, albeit guided, project producing an original piece of research and making a significant contribution to solving a problem and expanding the knowledge base in the specific discipline. While research is an ongoing process, in which one is expected to stay on top of the relevant developments in the discipline, the assumption is that students are capable of thinking through the important milestones in the dissertation process and developing a dissertation prospectus that spells out the core concepts and questions as well as the designs of research and the structure of intended dissertation. The overall aim of the course phase is that the students should further develop and enhance

their ability to independently plan, conduct and report on a research project which makes a contribution to the current state-of-the-art in the area. Also, the student should exhibit ability to in detail, creatively, with a high level of clarity and authority, using scientific scrutiny and adequate tools identify, explain, analyze and assess issues pertinent to a MS.c course in the research field, within which the course project is placed. On balance, a successful completion of the course phase is marked by student ability to do the following:

1. Apply his/her theoretical and methodological understanding and skills into devising researchable ideas and specific research questions and hypotheses,
2. Conduct a focused review of the relevant literature and create appropriate conceptual framework,
3. Develop a realistic research design with specific research strategies,
4. Communicate research ideas and their appropriate theoretical and methodological issues effectively and efficiently,
5. Gain understanding of the process of dissertation including stress, time, and project management, committee formation, dissertation proposition and defense, and human subjects reviews.
6. Develop and execute his/her survey to collect the necessary data to prove / support the problem that he has set up.
7. Identify own knowledge needs with respect to the planned project.
8. Write theses and report on research projects in a scientifically sound way.
9. Describe what the contribution of his/her course is and relate it to the current state-of-the-art within one or several international knowledge communities within the discipline
10. State the threats against and argue for the validity of her/his research methods, and in doing so, show awareness of that the concept of validity may have different values and be used in different ways within qualitative and quantitative research approaches.
11. Analyze a project course in a constructively critical way and identify the major strong and weak points of the course.
12. Describe how and where he/she has searched for, and why he/she has probably found the most relevant related work.

2- Intended Learning Outcomes (ILOs) for the whole program

The course is designed to achieve the above objectives through the following **Intended Learning Outcomes (ILOs)**:

Field	Programme ILOs	Course ILOs
Knowledge& Understanding	A1. Theories, basics and specialized knowledge in the field of learning, as well as the subjects that affect his/her professional practice.	a1-4 Exhibit ability to indetail, creatively, with a high level of clarity and authority, using scientific scrutiny and adequate tools identify, explain, and assess issues pertinent to a Diploma Project in the research field, within which the project is placed.
	A-4 Fundamentals of ethical & legal professional practice in the field of specialization.	a4-1 Recognize ethnical and professional responsibility issues arising in the practice of the engineering profession.

Intellectual skills	B1- Define and analyze problems in the field of specialization and sorting them according to priorities.	b1-1 Demonstrate an investigatory and analytic thinking approach (Problem solving) to solve problems related to civil engineering.
		b1-2 Interpret, analyze, and evaluate a given system specific information and relate it to the design of the required system.
	B-2 Solve specialized problems in the field of practice..	b-2-1Use the appropriate solution for engineering problems
	B-4 Conduct a research study and/or writing systematic scientific study about Research problem.	b4-1 Write an research plan to conduct applied research.
	B-5 Risk assessment in the professional practices related to the field of specialization,	b5-1 Evaluate pros and cons of given methodologies for civil engineering systems development.
Professional skills	C1- Mastering the basics as well as the latest professional skills in the field of specialization.	c1-1 Express competence skills, such as identifying, formulating, analyzing, and creating engineering solutions, using latest engineering techniques, skills, and tools.
General skills	D1- Communicate effectively using all methods.	d1-1 Express professional and communication skills to innovate and to interact with the scientific community, research team and technocrats involved in multinational companies at global level in the related fields to civil
	D3- Apply self evaluation and define personal educational needs.	d3-1 Apply self evaluation and specify his educational needs related to civil engineering aspects.
	D4- Set evaluation criteria and benchmarks to evaluate others performance.	d4-1 Design standards to evaluate others performance.
	D5- Work in a team and apply time management.	d5-1 Practicing team work in specified professional jobs.
	D6- Work in a team and lead teams in familiar professional context	d6-1 Practicing team work, and lead teams in specified professional jobs.
	D7- Time management effectively	d7-1 Manage the time use in a perfec way.

3- Course Phases:

The Project Course is an independent project (degree project) to develop and display the skills and abilities of the student to carry out individual, independent scientific work on a specific topic. The readings for the course work are selected by the individual student in collaboration with the supervisor.
The Project Course phases can be outlined as follow:

1. Developing a course proposal by formulating a realistic research plan with specific research strategies and specifying steps and timelines
2. Identify and construct a problem/course statement.
3. Presentation and defending of self-authored materials describing the course proposal at a seminar with external discussants (Department Staff).
4. Conduct a focused review of the relevant literature and create appropriate conceptual framework.
5. Analyze and evaluate methods and tools reported in a specified published articles and researches concerning the course problem in a constructively critical way and identify the major strong and weak points of them.
6. Carry out research:
   - Use state-of-the-art computer aided design tools.
   - Provide practical and/or laboratory services that can help.
7. Analysis and discussion of the simulated / practical results.
8. Developing defensible conclusions.
9. Writing the final course.
10. Presentation and defending of self-authored materials describing the course at a seminar with external discussants (Department Staff).
11. Reporting on and presenting the course in a final defense. At the examination seminar, the student should be able to respond to criticism given and also act as an opponent.

- The course work also includes a number of course workshop sessions in advance, where research and writing methods are discussed, and where the individual initial drafting of the course scope and outline is discussed.
- Throughout these phases:

  ➢ The academic supervisor helps and guides the students.
  ➢ The student is to write a manuscript in the format of a scientific article to be published.
  ➢ Documentation is carried out.

4- Relationship between the course and the program

Field	National Academic Reference Standard(NARS)			
	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
Program Academic Standards that the course contributes in achieving.	a4-1, a5-1,a6-1	B2-1, b4-2, b4-1, b5-1, , b6-1, b7-1	c1-1,	d1-1, d3-1, d4-1, , d6-1, d7-1, d8-1 d8-2

5- Course Subject Area:

A	B	C	D	E	F	G	
Humanities and Social Science	Mathematics and Basic Sciences	Basic Engineering Science	Applied Engineering And Design	Computer Applications and ICT	Projects and practice	Disccretionry subjects	Total
---	---	-	-	-	100		100%

6- Learning and Teaching Methods:

Besides proposing, planning, conducting and presenting one's own master course project, the student is required to read, analyze and evaluate methods and tools reported in a specified published articles and researches concerning the course problem in a constructively critical way and identify the major strong and weak points of them and write an opponent report about it. The supervisor supports and supervises the student throughout the entire course project, but it is the student who must take on the responsibility of requesting support and supervision during the on-going project. The student is expected to report to her/his supervisor at least every four weeks. Besides this, the student is required to hand in a written progress report at least every three months. One or several lectures or seminars held by internal guest researchers, and focusing on research methods and the art of presenting research results, are arranged during the course development. In-seminar discussions should be enhanced with additional student-advisor (and committee, if appropriate) meetings. Students are expected to be prepared for all seminar meetings. It is mandatory for the student to have regular contacts with the supervisor so that the supervisor is able to follow the student's work process to secure the progress and the quality of the work. The course work also includes a number of course workshop sessions in advance, where research and writing methods are discussed, and where the individual initial drafting of the course scope and outline is discussed.

7- Assessment Methods:

7.1 Assessment is carried out by evaluating of the student ability to clearly present the course orally and to discuss and defend the conclusions and the knowledge and arguments behind them, in a dialogue with examiner committee.

7.2 For a passing grade the student must (a) make an acceptable oral presentation of the course; (b) perform an acceptable defense of the course and should be able to respond to criticism given by the examiner committee and also act as an opponent.

8- Facilities required for teaching and learning

Blackboard – Class Room Equipped with Computer and Video Projector - Computer Lab – Specialized Electronic and Communication Lab - Library.

A. laboratory Usage:

Students are expected to prepare and conduct some computer simulation and practical works using computer ad specialized Electronic and Communication labs.

B. Library Usage:

Students should be encouraged to use library technical resources during the course development.

9- List of References:

The readings for the course work are selected by the individual student in collaboration with the supervisor.

10- Program Coordination Committee:

All staff

Programme coordinator: **Dr. Ahmed Turk**

Head of Department: **Prof. Dr. Mamdouh Saleh**

Date: 8/2019