University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: BA113	**Course Title:** Physics I **Prerequisites: None**	**Academic Year/Level:** 1st year / 1stNA Semester
Specialization: All programs	**No. of instructional units:** 3 **Lectures:** 2 **Practical: 1+1**	

2- Course Aim	1- To introduce the basic physical concepts of electricity, magnetism. 2- To introduce the applications of these physical concepts to engineering problems. 3- To expand upon and reinforce these concepts in the laboratory.
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. Introduce Coulomb's Law as the law of electric force Explain the concept of charge configuration and introduce Gauss's Law Explain the concept of electric potential energy Introduce the concept of the total energy of a charge configuration. Explain the concept of capacitance. Discuss different types of capacitors Introduce the concept of polarization, dielectic, and dielectric breakdown Explain the concept of electric current and emf. Introduce concepts of nodes and loops. Describe the magnetic force on charges, currents, and the magnetic torque.

	Explain Biot-Savart's law to obtain the magnetic field due to a line segment. Explain Ampere's law K2) Basics of information and communication technology (ICT) Define electric charge as a fundamental property of matter.(K2) List different methods of charging. Introduce Coulomb's Law as the law of electric force Explain the concept of charge configuration and introduce Gauss's Law Explain the concept of electric potential energy Introduce the concept of the total energy of a charge configuration. Explain the concept of capacitance. Discuss different types of capacitors Introduce the concept of polarization, dielectic, and dielectric breakdown Explain the concept of electric current and emf. Introduce concepts of nodes and loops. Explain Kirchoff's laws Describe the magnetic force on charges, currents, and the magnetic torque. Explain Biot-Savart's law to obtain the magnetic field due to a line segment. Explain Ampere's law • Explain Faraday's law of induction.(K2) List methods of induction.
b- Intellectual Skills	I2) Select appropriate solutions for engineering problems based on analytical thinking. Apply the student's knowledge of vectors for solving electric force problems. Illustrate the concept of symmetry in solving electric field problems. Compare the concepts of gravitational potential energy and electric potential energy. Analyze factors affecting the value of capacitance Relate knowledge of dielectric with natural phenomenon such as lightning and sparks Apply mathematical and computational methods (Cramer's rule). Apply mathematical and computational methods (Cross product). Apply the law for various current configurations Compare between Ampere's law and Gauss's law

c- Practical and Professional Skills	P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. Compare between different types of capacitors. Compare between the DC potential used in various applications. Interpret lab data.(P5) Interpret lab data Relate AC current with Faraday's law.
d- General and Transferable Skills	NA
4- Course Content	

Lecture		
Wk	Hrs	Description
1	2	Electrostatics.
2	2	Coulomb's law.
3	2	Gauss's law.
4	2	Electric potential energy.
5	2	Capacitance and capacitors.
6	2	Polarization and dielectrics.
7	2	7th week exam
8	2	Electric current, resistors and emfs.
9	2	Kirchhoff's rules.
10	2	Magnetic field, magnetic forces.
11	2	Biot-Savart's law.
12	2	12th week exam
13	2	Ampere's law.
14	2	Faraday's law of induction.
15	2	Revision.
16	2	Final Exam

5- Teaching and Learning Methods	1. Lectures 2. Tutorials 3. Lab work
6- Teaching and Learning Methods for Students with Special Needs	1. Consulting with lecturer during office hours. 2. Consulting with teaching assistant during office hours.
7- Student Assessment	

a- Procedures used:	1. Written examinations to assess the intended learning outcomes. 2. Continuous assessment (reports, discussions, projects,……) to assess the Intellectual skills.
b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 10 % Final-term Examination: 40 % Oral Examination : 0 % Practical Examination : 10 % Semester Work : 10 % Total : 100%
8- List of References:	
a- Course Notes	No notes
b- Required Books (Textbooks)	Physics for Scientists and Engineers with Modern Physics. John W. Jewett, Jr., Raymond A. Serway
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Issuer:

Course coordinator: Prof. Dr. Samir Youssef

Program Manager:

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: BA114	**Course Title:** Physics II	**Academic Year/Level:** 1st year / 2nd Semester
	Prerequisites: B113 physics 1	
Specialization: All programs	**No. of instructional units:** 3 **Lectures:** 2 **Practical: 1+1**	

2- Course Aim	4- To introduce heat, work, and the laws of thermodynamics. 5- To introduce the applications of these physical concepts to engineering problems. 6- To expand upon and reinforce these concepts in the laboratory.
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	1) Concepts and theories of mathematics and sciences, appropriate to the discipline. Explain the formulation of work energy Formulate the first law of thermodynamics as the law of conservation of energy Explain heat, work, internal energy, enthalpy in connection with the mentioned quasi-static processes Explain heat, work, internal energy, enthalpy in connection with the mentioned quasi-static processes Describe entropy as a property of the system Explain Fourier's law of conduction K2) Basics of information and communication technology (ICT) Introduce the concept of heat energy Define ideal gases.

	Explain phase transformations. Explain the equipartition theorem of statistical mechanics and apply it to obtain the internal energy of an ideal gas, making use of the degrees of freedom Explain the formulation of work energy Formulate the first law of thermodynamics as the law of conservation of energy Explain heat, work, internal energy, enthalpy in connection with the mentioned quasi-static processes Explain heat, work, internal energy, enthalpy in connection Motivate the necessity of the second law of thermodynamics. with the mentioned quasi-static processes Describe entropy as a property of the system Explain Fourier's law of conduction Explain the phase diagram of water, and the use of the steam tables
b- Intellectual Skills	I2) Select appropriate solutions for engineering problems based on analytical thinking. Compare between ideal and non-ideal gases Apply integration techniques to obtain the work on the PV-diagram Relate real life experiences with the first law of thermodynamics. Apply the quasi-static processes in thermodynamic cycles. Relate everyday's experiences with the second law. Apply the second law of thermodynamics for obtaining the maximum efficiency of a heat engine and coefficient of performance of a refrigerator. Compare between Fourier's law and Ohm's law.
c- Practical and Professional Skills	P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. Interpret lab data.
d- General and Transferable Skills	NA

4- Course Content

Lecture		
Wk	Hrs	Description
1	2	Heat energy and phase transformations.
2	2	Ideal gases and degrees of freedom.
3	2	Equipartition theorem and internal energy.
4	2	Work energy.
5	2	First law of thermodynamics.
6	2	Isochoric, isobaric, isothermal processes.
7	2	7th week exam
8	2	Adiabatic, polytropic processes.
9	2	Thermodynamics cycles.
10	2	Second law of thermodynamics: Entropy.
11	2	Heat engines and refrigerators.
12	2	12th week exam
13	2	Heat transfer by conduction.
14	2	Phase diagram and steam tables.
15	2	Revision.
16	2	Final Exam

5- Teaching and Learning Methods

Lectures
Tutorials
Lab work

6- Teaching and Learning Methods for Students with Special Needs

Consulting with lecturer during office hours.
Consulting with teaching assistant during office hours.

7- Student Assessment

a- Procedures used:

Written examinations to assess the intended learning outcomes.
Continuous assessment (reports, discussions, projects……) to assess the intellectual skills.

b- Schedule:

Assessment 1: 7th Week Written Exam
Assessment 2: 12th Week Written Exam
Assessment 3: Continuous Assessments
Assessment 4: 16th Week Final Written Exam

c- Weighing of Assessment:

7th Week Examination : 30 %
12th Week Examination: 10 %
Final-term Examination: 40 %
Oral Examination : 0 %
Practical Examination : 10 %
Semester Work : 10 %
Total : 100%

8- List of References:	
a- Course Notes	No notes
b- Required Books (Textbooks)	Physics for Scientists and Engineers with Modern Physics. John W. Jewett, Jr., Raymond A. Serway Applied Thermodynamics for Engineering Technologists Eastop and McConkey
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Issuer:

Course coordinator: Prof. Dr. Samir Youssef

Program Manager:

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code:	**Course Title:**	**Academic Year/Level:**
BA141	**Mechanics I**	1st year / 1st Semester
	Prerequisites: None	
Specialization: All program	**No. of instructional units:** 3 **Lectures:** 2 **tutorial : 2**	

2- Course Aim	The aim of the course is to provide the student with an introduction to many of the fundamental concepts in mechanics.
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. **a1**. Define the scalars and vectors quantities. **a2**. Express the forces in plan and space. **a3**. Recognize equilibrium conditions and objectives. **a4**. Identify the concept of moment and couple system. **a5**. Identify different types of support and its reactions. **a6**. Explain the concepts of friction and its applications. **a7**. Define the principle work and virtual work.
b- Intellectual Skills	I2) Select appropriate solutions for engineering problems based on analytical thinking. **b1**. Determine the resultant force and its direction. **b2.** Use free bodies diagrams analyses to determine the sum of the forces. **b3**. Solve plane motion rigid body dynamics problems using full vector notation approaches.

	b4. Determine the forces and their types in the members of a truss using the method of joint. **b5**. Determine the forces and their types in the members of a truss using the method of section. **b6**. Analyze the forces action on the members of frames and machines composed of pin-connected members. **b7**. Determine the mass moment of inertia.
c- Practical and Professional Skills	P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. **c1**. Apply equations of equilibrium to solve rigid body problems. **c2**. Solve problem having two loaded bodies connected with internal support.
d- General and Transferable Skills	G6) Effectively manage tasks, time, and resources. **d1**. Check the ability of the students to decompose applied problems and get an analytical solution in a specified time by short quiz.
4- Course Content	

Lecture		
Wk	Hrs	Description
1	2	*Rectangular components of forces*
2	2	***Parallelogram law***
3	2	*Equilibrium of a particle – springs and cables*
4	2	moment of forces
5	2	Free body diagram
6	2	*Equilibrium of a rigid body*
7	2	7th week Exam
8	2	Trusses (joint method – zero – force members) .
9	2	Trusses (method of sections) .
10	2	Frames
11	2	Frames (cont.)
12	2	12th week Exam
13	2	Friction
14	2	Mass moment of inertia
15	2	Virtual work
16	2	Final Exam

5- Teaching and Learning Methods	1. Lectures 2. Tutorials 3. Individual and group coursework 4. Project group technical reports 5. Individual and group projects

6- Teaching and Learning Methods for Students with Special Needs	1. Consulting with lecturer during office ours 2. Consulting with teaching assistant during office ours.
7- Student Assessment	
a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. 2. Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills.
b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Practical Examination : 0 % Semester Work : 10 % Total : 100%
8- List of References:	
a- Course Notes	Prepared by lecturer
b- Required Books (Textbooks)	R.C Hibbeler "Engineering Mechanics Statics " 12th. edition, Prentice Hall, 2010.
c- Recommended Books	F.B. Beer and E.R. Johnston " Vector Mechanics for Engineering" , 9th. edition , Mcgraw Hill , 2009.
d- Periodicals, Web Sites, …, etc.	

Issuer:

Course coordinator: Dr.: Wael Abbas

Program Manager:

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: BA142	**Course Title:** Mechanics II	**Academic Year/Level:** 1st year / 2nd Semester
	Prerequisites: BA114 Mechanics 1	
Specialization: All program	**No. of instructional units:** 3 **Lectures:** 2 **tutorial : 2**	

2- Course Aim	To provide the student with a clear and thorough presentation of the theory and applications of engineering mechanics.
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. a1 .Recognize the concepts of particle motion with variable acceleration a2. Identify the principle and rules of projectile a3. State newton's law of motion. a4. Classify the various types of rigid body planar motion. a5. Define general plane motion. a6. Define the relative analysis velocity and acceleration a7. Identify the mass moment of inertia
b- Intellectual Skills	I2) Select appropriate solutions for engineering problems based on analytical thinking. **b1**. Calculate the veliocty, acceleration and

	displacement of particle motion along a straight line at a given instant. **b2** Evaluate the kinematical properties of a projectile **b3** Apply equations of motion to solve the kinetics problems of particle. **b4.** Apply the theorem of conservation of energy to solve kinetics particle problems. **b5**. Analyze motion about fixed axis. **b6**. Calculate velocity and acceleration of members. **b7**. Discuss applications of equations to bodies undergoing rotational motion. **b8**. Apply the theorem of conservation of energy to solve kinetics rigid body problems.
c- Practical and Professional Skills	P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. **c1**. Use free bodies diagrams analyses to simplify and solve the kinetics problems of particle. **c2**. Apply the equations of motion and principle work and energy to solve the kinetics problems of rigid body
d- General and Transferable Skills	G6) Effectively manage tasks, time, and resources. **d1**. Check the ability of the students to decompose applied problems and get an analytical solution in a specified time by short quiz.
4- Course Content	

Lecture		
Wk	Hrs	Description
1	2	Kinematics of a particle – Rectilinear Kinematics.
2	2	Curvilinear motion : Rectangular components, projectile motion.
3	2	Force and acceleration (Kinetics), Newton's laws.
4	2	Work and energy of a particle (kinetics)
5	2	Rotation of a rigid body about a fixed axis.
6	2	General plane motion.
7	2	7th week exam.
8	2	Relative motion: velocity.
9	2	Relative motion: acceleration
10	2	Planar Kinetics of a rigid body: Equation of translational motion
11	2	Equation of rotational motion.
12	2	12th week exam.
13	2	Equation of General plane motion
14	2	Work and Energy
15	2	Review
16	2	Final Exam

5- Teaching and Learning Methods	1. Lectures 2. Tutorials 3. Individual and group coursework 4. Project group technical reports 5. Individual and group projects
6- Teaching and Learning Methods for Students with Special Needs	1. Consulting with lecturer during office ours 2. Consulting with teaching assistant during office ours.
7- Student Assessment	
a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. 2. Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills.
b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Practical Examination : 0 % Semester Work : 10 % Total : 100%
8- List of References:	
a- Course Notes	Prepared by lecturer
b- Required Books (Textbooks)	R.C Hibbeler "Engineering Mechanics Dynamics " 12th. edition, Prentice Hall, 2010.
c- Recommended Books	F.B. Beer and E.R. Johnston " Vector Mechanics for Engineering" , 9th. edition , Mcgraw Hill , 2009.
d- Periodicals, Web Sites, ..., etc.	

Issuer:

Course coordinator: Ass. Prof. El-tantawy Farid

Program Manager:

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: **BA(123)**	**Course Title:** **Math I**	**Academic Year/Level:** 1st year / 1st Semester
	Prerequisites: None	
Specialization: All programs	**No. of instructional units:** 3 **Lectures:** 1 **Practical: 1**	

2- Course Aim	The aim of this course is the differentiation and some of its applications, basic differentiable functions of one variable. It includes definitions and intuitive meanings of derivatives; Higher derivatives; Basic techniques of differentiation; Chain Rule; Parametric equations; Partial differentiation; Implicit differentiation; Inverse function theorem; Logarithmic differentiation; differentiation; Logarithmic functions; Exponential functions; Trigonometric functions; Inverse trigonometric functions; Hyperbolic functions; Differentiation of those; Physical and geometric applications of differentiation; Limits; N^{th} derivative; L'Hôpital rule; Maclaurin's expansion as approximations of functions; curve sketching; complex numbers; Conic sections.
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. - Recall basic differentiation rules. - Define trigonometric functions. - Define the inverse trigonometric functions. - Define logarithmic function and their derivatives. - Define exponential functions. - Define hyperbolic functions and their inverse.

	- Define parametric and implicit differentiation. - Define the undetermined forms. - Define a critical number, relative extreme of a function, points of inflection, asymptotes. - Define a function as a power series. - Define partial derivatives of a function of two variables. - Define a complex number.
b- Intellectual Skills	I2) Select appropriate solutions for engineering problems based on analytical thinking. - Explain how to derive the derivatives of the inverse trigonometric functions. - Explain how to derive the derivatives of the logarithmic Functions. - Explain how to derive the derivatives of the exponential Functions. - Explain how to derive the derivatives of the hyperbolic functions and their inverse . - Explain when and how to use L'Hospital rule.
c- Practical and Professional Skills	P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. - Apply basic rules of differentiation in driving the derivatives of the trigonometric functions. - Apply calculus to analyze and sketch graphs of functions. - Apply a basic list of Maclaurin's expansion to find other Macluarin's expansions.
d- General and Transferable Skills	NA
4- Course Content	

Lecture		
Wk	Hrs	
1	2	Basic rules of differentiation.
2	2	Trigonometric function and their derivatives
3	2	Inverse of trigonometric and their derivatives
4	2	Logarithmic function and their derivatives
5	2	Exponential function and their derivatives
6	2	Hyperbolic functions , Inverse hyperbolic functions and their derivatives
7	2	7th week exam
8	2	Parametric differentiation, Implicit differentiation
9	2	L'Hospital rule
10	2	Curve sketching
11	2	Maclaurin's expansions
12	2	12th week exam
13	2	Partial Differentiation
14	2	Complex numbers
15	2	. Revision

	16 | 2 | Final Exam
5- Teaching and Learning Methods	1. Lectures 2. Tutorials 3. Individual and group course homework
6- Teaching and Learning Methods for Students with Special Needs	1. Consulting with lecturer during office ours 2. Consulting with teaching assistant during office hours 3. Private sessions for redelivering the lecture contents
7- Student Assessment	
a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills.
b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Practical Examination : 0 %

	Semester Work : 10 % Total : 100%
8- List of References:	
a- Course Notes	Prepared by Lecturer
b- Required Books (Textbooks)	
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Issuer:

Course coordinator: Dr. Ahmed El-Bakly

Program Manager:

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: **BA(124)**	**Course Title:** **Math II**	**Academic Year/Level:** 1st year / 2nd Semester
	Prerequisites: BA123 Math 1	
Specialization:	**No. of instructional units:** **Lectures:** **Practical:**	

2- Course Aim	To learn integration using different methods.To use these techniques in solving some application like to find the area, the volume, the length of a curve, and the average of a curve. To solve problems using numerical integration. To learn elementary linear algebra, solution of linear equations using matrices and determinants.
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. - Recall basic integration rules. - Discuss the fundamental theorem of calculus. - Discuss the second fundamental theorem of calculus. - Explain a technique that can be used to transform complicated integration problems into simpler ones. - Review on last formulas and techniques. - Recall the method of completing the square. - List a formula which is particularly useful in calculating integrands involving products of algebraic and transcendental functions. - Discuss how integration by parts can be used to derive a reduction formula. - Recall trigonometric identities.

	- List guidelines for integrals involving trigonometric functions. - Recall that a rational function is a ratio of two Polynomials. - Define parabola, ellipse and hyperbola. - Define a formula to obtain the area between two curves. - Define a formula to obtain a described volume (The Washer Method). - Define a formula to obtain the arc length of a smooth curve. - Define a formula to obtain the area of the surface of revolution.
b- Intellectual Skills	I2) Select appropriate solutions for engineering problems based on analytical thinking. - Evaluate integrals using basic integration rules. - Evaluate definite integral using the fundamental theorem of calculus. - Evaluate integrals using appropriate substitutions. - Evaluate integrand using completion of the square may lead to an integral that can be expressed in terms of inverse trigonometric or an inverse hyperbolic functions. - Evaluate integrals using integration by parts method. - Express an integral involving a power of a function in terms of an integral involves a lower power of that function. - Evaluate integrals involving trigonometric functions. - Evaluate integrals using trigonometric substitutions. - Analyse a rational function into a sum of simple rational functions that can be integrated by methods studied earlier lectures. -Identify and Sketch the graphs of quadratic equations.
c- Practical and Professional Skills	P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. - Calculate the area between to curves. - Calculate the volume of a solid of revolution. - Calculate the area of a surface of revolution. - Calculate the arc length.
d- General and Transferable Skills	NA

4- Course Content

Lecture		
Wk	Hrs	Basic Integration Rules.
1	2	Fundamental theorem of calculus.
2	2	Integration by substitution
3	2	Integration by substitution
4	2	Review of formulas and techniques (completing the squares)
5	2	Integration by parts.
6	2	Integration by reduction and integration by induction.
7	2	7th week exam.
8	2	Trignometric Integrals
9	2	Trigonometric substitutions.
10	2	Integration of rational functions using partial fractions.
11	2	Conic sections
12	2	12th week exam.
13	2	Applications of the Definite Integral (Areas and Volumes).
14	2	Applications of the Definite Integra (Surface Area and Arch Length).
15	2	. Review
16	2	Final Exam

5- Teaching and Learning Methods

1. Lectures
2. Tutorials
3. Individual and group course homework

6- Teaching and Learning Methods for Students with Special Needs

1. Consulting with lecturer during office ours
2. Consulting with teaching assistant during office hours
3. Private sessions for redelivering the lecture contents

7- Student Assessment

a- Procedures used:

1. Written examinations to assess the Intended learning outcomes.
   Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills.

b- Schedule:

Assessment 1: 7th Week Written Exam

Assessment 2: 12th Week Written Exam

Assessment 3: Continuous Assessments

Assessment 4: 16th Week Final Written Exam

c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Practical Examination : 0 % Semester Work : 10 % Total : 100%
8- List of References:	
a- Course Notes	Prepared by Lecturer
b- Required Books (Textbooks)	
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Issuer:

Course coordinator: Prof. Dr. Mohsen Salah

Program Manager:

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: **BA(223)**	**Course Title:** **Math III**	**Academic Year/Level:** 2nd year / 3rd Semester
	Prerequisites: BA124 Math II	
Specialization:	**No. of instructional units:** **Lectures:** **Practical:**	

2- Course Aim	To study varies methods of solving differential equations, which arise as mathematical modeling in many topics of engineering.
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. Define and classify an ordinary D.E. Define solution of a D.E. Review on integration techniques and basic algebric rules Recognize the form of the general solution from the corresponding characteristic equation. Explain the method of undetermined coefficients. Define Laplace transform. List properties of Laplace transform. Review on Partial fractions. Define the inverse Laplace transform. Define the Convolution of two functions. Define Fourier series. (
b- Intellectual Skills	I2) Select appropriate solutions for engineering problems based on analytical thinking. Solve a separable D.E. Solve a homogenous D.E.

	Solve an exact D.E. Solve a linear D.E. Solve a Bernoulli's D.E. Solve a 2nd order linear homogenous D.Es with constant coefficients Use method of undetermined coefficients to Solve a 2nd order linear non-homogenous D.E with constant coefficients. Use properties of Laplace transform to compute the Laplace transform of some functions. Use properties of inverse Laplace transform to compute the inverse Laplace transform of some functions. Use The Laplace Transform to solve initial value problems. Use The Laplace Transform to solve systems of differential equations. Solve problems on Fourier series.
c- Practical and Professional Skills	NA
d- General and Transferable Skills	NA
4- Course Content	

Lecture		
Wk	Hrs	
1	2	Introduction to ordinary differential equations
2	2	Solving 1st order D.Es. Separable D.Es / Initial value problem
3	2	Solving 1st order D.Es. homogeneous and Exact D.Es
4	2	Solving 1st order D.Es. Linear and Bernoulli's D.Es
5	2	Solving 2nd order, linear, homogenous D.Es with constant coefficients
6	2	Solving 2nd order, linear, non-homogenous D.Es with constant coefficients
7	2	7th week exam
8	2	Laplace transform
9	2	Inverse Laplace transform
10	2	Unit step function/ Dirac delta function.
11	2	Applications: Solution of D.E. using Laplace Transform
12	2	12th week exam
13	2	Applications to integral Equations
14	2	Fourier series

	15 | 2 | . Revision 16 | 2 | Final Exam
5- Teaching and Learning Methods	1. Lectures 2. Tutorials Individual and group course homework
6- Teaching and Learning Methods for Students with Special Needs	1. Consulting with lecturer during office ours 2. Consulting with teaching assistant during office hours Private sessions for redelivering the lecture contents
7- Student Assessment	
a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills.
b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam

c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Practical Examination : 0 % Semester Work : 10 % Total : 100%
8- List of References:	
a- Course Notes	Prepared by Lecturer
b- Required Books (Textbooks)	
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Issuer:

Course coordinator: Dr. Eman Shafik

Program Manager:

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: BA224	**Course Title:** Mathematics IV **Prerequisites: BA 223 MathIII**	**Academic Year/Level:** 2nd year / 4th Semester
Specialization: All programs	**No. of instructional units:** 3 **Lectures:** 2 **Practical: 1**	

2- Course Aim	1-To introduce the basic Vector Differential Calculus and its applications. 2- To introduce the basic Vector integral Calculus and its applications. 3- To introduce the Complex Analysis.
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. Recall basic rules of vector analysis (K1) Define Partial Differentiation and Derivatives of vector functions (K1) Define the different vector operators (K1) Define how to solve line integral (K1) Define meaning of conservative vector fields (K1) Define how to solve Surface Integrals / Green's Theorem (K1) Define how to solve Triple Integrals and Divergence (Gauss' Theorem) (K1) Define how to solve Stoke's Theorem (K1) Define different types of integrals theorem (K1) Define Complex numbers and functions and forms of representation (K1) Define Analytic functions and Harmonic functions (K1) Define Line complex integrals and Cauchy's Integrals Theorem (K1) Define Zeros and poles of Analytic functions/ Residues and their evaluation (K1) Define Residue Theorem / Application to Real Integral (K1)

b- Intellectual Skills	NA
c- Practical and Professional Skills	P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems Apply basic rules of partial differentiation in driving the derivatives of the vector functions.(P1) Apply Green's theorem (P1) Apply Gauss theorem (P1) Apply Stok's theorem (P1)
d- General and Transferable Skills	NA
4- Course Content	

Lecture		
Wk	Hrs	Description
1	2	Vector Algebra / Dot and cross product and Applications.
2	2	Partial Differentiation / and Derivatives of vector functions.
3	2	Gradient / Divergence/ curl/ Laplacian.
4	2	Line Integrals / line Integrals Independent of the path / Exactness.
5	2	Conservative vector fields.
6	2	Double Integrals in Cartesian and polar coordinates / Green's Theorem
7	2	Surface Integrals / Stokes' Theorem /7th week Exam.
8	2	Triple Integrals / Divergence (Gauss' Theorem).
9	2	Review on Integrals Theorems.
10	2	Complex numbers and functions / forms of representation.
11	2	Analytic functions/ Harmonic functions.
12	2	Line complex integrals / Cauchy's Integrals Theorem /12th week Exam.
13	2	Zeros and poles of Analytic functions/ Residues and their evaluation.
14	2	Residue Theorem / Application to Real Integral
15	2	General Revision.
16	2	Final Exam

5- Teaching and Learning Methods	1. Lectures 2. Tutorials 3. Individual coursework

6- Teaching and Learning Methods for Students with Special Needs	1. Consulting with lecturer during office hours 2. Consulting with teaching assistant during office ours 3. Private sessions for redelivering the lecture contents
7- Student Assessment	
a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. 2. Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills.
b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Semester Work : 10 % Total : 100%
8- List of References:	ADVANCED ENGINEERING MATHEMATICS
a- Course Notes	No notes
b- Required Books (Textbooks)	ADVANCED ENGINEERING MATHEMATICS
c- Recommended Books	ADVANCED ENGINEERING MATHEMATICS
d- Periodicals, Web Sites, …, etc.	

Issuer:

Course coordinator: Dr. Alfaisal Abdelhameed

Program Manager:

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: BA329	**Course Title:** Probability and Statistics	**Academic Year/Level:** 3rd year / 5th Semester
	Prerequisites: BA224 Math IV	
Specialization: Construction and Building Engineering	**No. of instructional units:** 3 **Lectures:** 2 **Practical: 1**	

2- Course Aim	1-To introduce the Statistical analysis on statistical data. 2- To introduce the theory of Probability and its applications. 3- To introduce the Curve Fitting.
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. - Recall basic rules of statistical analysis - Define statistical measurements and elementary probability - Define the conditional probability - Define independent evevts - Define Bays theorem - Define Combinatorial analysis. Discrete probability distribution - density function - Define Continuous probability distribution – density function - Define Mathematical expectation, mean and variance. - Define Special discrete distribution Bernoulli. - Define Geometric and Poisson distributions. - Define Special continuous distribution: Uniform –

	negative exponential. Normal distribution - Define The exponential model in reliability. The exponential model in life testing - Define Curve Fitting
b- Intellectual Skills	NA
c- Practical and Professional Skills	P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. - Apply Mathematical expectation, mean and variance - Apply Curve Fitting P7) Apply numerical modeling methods to engineering problems.
d- General and Transferable Skills	NA
4- Course Content	

Lecture		
Wk	Hrs	Description
1	2	Statistical analysis on statistical data.
2	2	Statistical measurements. Elementary probability
3	2	Conditional probability.
4	2	Independent and dependent events
5	2	Bayes Theorem.
6	2	Combinatorial analysis. Discrete probability distribution - density function
7	2	7th week Exam.
8	2	Continuous probability distribution – density function
9	2	Mathematical expectation, mean and variance.
10	2	Special discrete distribution Bernoulli.
11	2	Geometric and Poisson distributions.
12	2	Special continuous distribution: Uniform – negative exponential. Normal distribution / 12th week Exam.
13	2	The exponential model in reliability. The exponential model in life testing
14	2	Curve Fitting
15	2	General Revision.
16	2	Final Exam

5- Teaching and Learning Methods	1. Lectures 2. Tutorials 3. Individual coursework
6- Teaching and Learning Methods for Students with Special Needs	1. Consulting with lecturer during office hours 2. Consulting with teaching assistant during office ours 3. Private sessions for redelivering the lecture contents
7- Student Assessment	
a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. 2. Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills.
b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Semester Work : 10 % Total : 100%
8- List of References:	ADVANCED ENGINEERING MATHEMATICS
a- Course Notes	No notes
b- Required Books (Textbooks)	ADVANCED ENGINEERING MATHEMATICS
c- Recommended Books	ADVANCED ENGINEERING MATHEMATICS
d- Periodicals, Web Sites, …, etc.	

Issuer:

Course coordinator: Dr. Alfaisal Abdelhameed **Program Manager:**

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CC111	Course Title: **Introduction To Computer**	**Academic Year/Level:** 1st year / 1st semester
	Prerequisites: None	
Specialization:	**Credit Hours: 3** **Lecture** 2 **Practical** 2	

2- Course Aim	▪ .The students must have a general understanding of what computers are and how they operate. ▪ The students must have good skills in using windows, MS PowerPoint, HTML and Visual Basic. ▪ The students must learn problem solving techniques and program development. ▪ The student should know the available programming languages and their capabilities
3- Intended Learning Outcome	
a- Knowledge and Understanding	• K2.Study basic information s of computers and different types of computers and uses • K 11. Discussing economical uses of computers • Uses of computer in different areas of life • K2. Learning and discussing processor and different memory unit • K2. Study size and types of storage ,input and output devices • K 16. Studying Different types of storage media • K1.Converting between different numbering systems • K 16. Knowing software and applications such as images, graphics….etc • K 6. Using flowcharts for solving different types of problems • K 6. Visual basic language code to make small programs

	• K 6. Studying HTML language code to design web pages • K 12. Studying HTML language to design web pages • K2. Learning basics of network and network types and topologies. • K 8. Discussing uses of networks in different areas • K 11. Studying ethics of uses of IT technologies • K 9. Learn the ethics of how to deal with others entities in the technology world and other users • K 11. Discussing the developments computer world and its effect on the different environmental
b- Intellectual Skills	**NA**
c- Practical and Professional Skills	• P1.Studying mathematical of converting between different numbering systems • P1. Studying how to design flowcharts used to solve different problems • P1.use visual basic to convert flowchart to a real program •
d- General and Transferable Skills	• G3.how to deal with computer and the use of the computers in real world • G3. Discussion of different ethics and computer crimes.

4- Course Content	**Week 1.** Introduction to the World of Computers Input and Output **Week 2.** The System Unit: Processing and Memory **Week 3.** Storage and Input/Output Devices **Week 4.** System Software and Application Software **Week 5.** Quiz 1 + Program Development, Programming Languages, and Flow charts **Week 6.** Visual Basic 1 **Week 7.** 7th Week Exam **Week 8.** Visual Basic 2 **Week 9.** Visual Basic 3 **Week 10.** Quiz 2 + Web page design using HTML 1 **Week 11.** Web page design using HTML 2 **Week 12.** 12th Week Exam **Week 13.** Communications and Networks 1 **Week 14.** Communications and Networks 2 **Week 15.** Ethics, Computer Crime, Privacy, and other Social Issues
5- Teaching and Learning Methods	• Lectures Powerpoints • Class discussions • Library/Internet searches
6- Teaching and Learning Methods for Students with Special Needs	Personalized teaching is available for special needs students and an academic advisor is appointed to follow up with these students and to monitor progress.
7- Student Assessment:	
a- Procedures used:	• Assignments • Quizzes • Midterm written exam (7^{th}, 12^{th}) • Practical exam • Final written exam
b- Schedule:	• Quizzes (6^{th} and 11^{th}) • Practical exam (14^{th}) • Final written exam
c- Weighing of Assessment:	7^{th} Week Examination 30 % 12^{th} Week Examination 20 % Final-term Examination 40 % Oral Examination 0 % Practical Examination 0 % Semester Work 10 % Total 100%

8- List of References:	▪ Cashman, Shelly, Wood, and Dorin, "HTML: Complete concepts and technologies", Thomson course technology, latest edition. ▪ Peter Norton, "Introduction to computers", McGraw Hill, latest edition. ▪ Robert J. Spear and Timothy M. Spear, "Introduction to computer programming in Visual basic 6.0", Thomson Learning, latest edition.
a- Course Notes	• Course Powerpoint • Sheets • Practical material sheets
b- Required Books (Textbooks)	Charles S. Parker, Deborah Morley, "Understanding Computers Today and Tomorrow", Course Technology 2009, latest edition.
c- Recommended Books	N/A
d- Periodicals, Web Sites, …, etc.	N/A

Course Instructor: **Head of Department:** Prof. Ahmed Fahmy

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CC114	Course Title: **Introduction to Programming**	**Academic Year/Level:** 1st year / 2nd semester
	Prerequisites: CC111 Intro. To computers.	
Specialization:	**Credit Hours: 3** **Lecture** 2 **Practical** 2	

2- Course Aim	This course will help students know the concepts of programming using VB, and knowing how to use editors to implement these concepts.
3- Intended Learning Outcome	
a- Knowledge and Understanding	• Introduce students to Visual Basic UI (K4) • Understand variables and how they allocated into memory (K4) • Introducing TextChanged event (K4) • Learn about textboxes and buttons (K4) • Learn how to write simple program as a pseudo code (K4) • Learn about the concepts of loops and how they work (K4) • Learn about the Do While and Do until loops and the difference between them (K4) • Learn about Do... Loop while and Loop Until and the difference from the previous lesson (K4) • Learn about For … Next loops (K4) • Learn about Select Case multiple selection statements (K4) • Use TextBox property PasswordChar (K4) • Learn how to obtain current date and time (K4) • Understand the meaning of 1D arrays structures and their

	usage (K4) • Learn how to use ComboBox (K4) • Understand the meaning of 2D arrays (K4) • Learn how to use RadioButton (K4) • Understand the difference between 1D and 2D arrays (K4) • Learn about difference between Function and Sub procedures (K4) • Understand the components of procedures (K4) • Learn about the usage arithmetic operations and can be evaluated (K5) • Learn about program control and the sequence of execution (K5)

b- Intellectual Skills	• NA
c- Practical and Professional Skills	• Implement the graphical user interface of simple application (P6) • Apply the order of arithmetic operations to solve equations (P1) • Introduce students to debugger usage (P1,P6) • Write simple handler to solve arithmetic equations (P6) • Use of the debugger breakpoints (P1,P6) • Make a program that uses checkboxes and message dialogs (P6) • Make a program that uses Do While and Do until loops (P6) • Convert from Do while to Do Until loops and vice versa (P1) • Make a program that uses Do... Loop while and Loop Until (P6) • Make a program that uses For … Next loops (P6) • Make a program that uses Select Case statments (P6) • Students have to use arrays to sort string alphabetically (P1) • Use 2D arrays to represent students grades (P1) • Apply the concepts of functions and procedures to implement a Fibonacci calculation application (P1) •

d- General and Transferable Skills	NA

4- Course Content	**Week 1.** Introduction to visual basic. **Week 2.** Introducing variables, memory concepts and arithmetic. **Week 3.** Illustrating application example. **Week 4.** Introducing algorithms, pseudo code, program control, checkboxes and dialogs. **Week 5.** Sample applications. **Week 6.** Introducing the Do While…Loop and Do Until…Loop Repetition Statements. **Week 7.** Introducing the Do …Loop While and Do …Loop Until Repetition Statements. **Week 8.** Introducing the For … Next Repetition Statement. **Week 9.** Introducing the Select Case Multiple-Selection Statement. **Week 10.** Introducing One-Dimensional Arrays. **Week 11.** Introducing Two-Dimensional Arrays. **Week 12.** Two-Dimensional Arrays Application. **Week 13.** General Application. **Week 14.** Functions and Procedures. **Week 15.** Fibonacci Application.
5- Teaching and Learning Methods	Lectures, tutorials and reading material
6- Teaching and Learning Methods for Students with Special Needs	Personalized teaching is available for special needs students and an academic advisor is appointed to follow up with these students and to monitor progress.
7- Student Assessment:	
a- Procedures used:	Written Exams (7^{th} and 12^{th}) Final Exam Class work

b- Schedule:	Written Exam (7th and 12th week) Final Exam (16th week) Class work (continuous)	
c- Weighing of Assessment:	7th Week Examination	30 %
	12th Week Examination	20 %
	Final-term Examination	40 %
	Oral Examination	0 %
	Practical Examination	0 %
	Semester Work	10 %
	Total	100%
8- List of References:		
a- Course Notes	N/A	
b- Required Books (Textbooks)	Deitel, P.J; Deitel, H.M; Ayer, D.J, Simply Visual Basic 2008: An Application-Driven Tutorial Approach, 3rd Edition, Pearson International Edition (or Pearson Education), 2009.	
c- Recommended Books	N/A	
d- Periodicals, Web Sites, ..., etc.	N/A	

Course Instructor: **Head of Department:** Prof. Ahmed Fahmy

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12): **Course Specification**

1- Course Data

Course Code: **CC413**	Course Title: **Numerical Analysis**		Academic Year/Level: **4th year / 7th semester**
	Prerequisites: CC114 Intro. To programming.		
Specialization: **Computer Engineering**	No. of Instructional Units	Lecture	Practical
	3	**2**	**2**

2- Course Aim

- Solving Equations, error analysis, solving system of linear algebraic equations, numerical differentiation and integration, Interpolation and regression.

3- Intended Learning Outcomes

a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • Learn the theories of solving equations (K1) • Learn the methodologies of finding roots off equations (Bisection, False Position and Secant) (K5) • Learn the methodologies of finding roots off equations (Successive and Modified Successive Approximation) (K5) • Learn the methodologies of finding roots off equations (Newton Raphson) (K5) • Learn the methodologies of finding roots off equations (Berge Vieta) (K5) • Differentiate between different types of errors (K5) • Concepts of linear equations (K1) • Learn the methodologies of solving linear equations (Gauss elimination and Gauss Jordan) (K5) • Learn the methodologies of solving linear equations (Gauss Jordan method for Integral matrices) (K5) • Learn the methodologies of solving linear equations (Jacobi, Gauss Siedel) (K5) • Learn the meaning and usage of matrix inversion (K1) • Learn the concepts of interpolation (K1) • Learn the different methodologies of numerical interpolation (Linear, Quadratic, and Lagrange polynomials) (K5) • Learn how to calculate differentiation using mathematical methods (2 and 3 points forward and backward - midpoint) (K5) • Learn how to calculate integration using mathematical methods (Mid-point) (K5) • Learn how to calculate integration using mathematical methods (Trapezoidal, Composite Trapezoidal, Simpson, Composite Simpson and Gaussian) (K5) • Learn the concepts of regression (K1) • Learn the different methodologies of regression (Linear and Quadratic) (K5) • Learn the different methodologies of regression (Lagrange) (K5) •

b- Intellectual Skills	• Select appropriate method to solve one variable equations problems (I1) • Select appropriate method to solve one variable equations problems (I1) • Select appropriate method to solve one variable equations problems (I1) • Select appropriate method to solve one variable equations problems (I1) • Differentiate between the results of the various-one-variable-equations methods (I11) • Design a computer application to simulate the solution to one of the methods (I12) • Select appropriate mathematical solutions to minimize errors (I2) • Select appropriate method to solve linear equations problems (I1) • Select appropriate method to solve linear equations problems (I1) • Select appropriate method to solve linear equations problems (I1) • Select appropriate method to solve interpolation problems (I1) • Select appropriate method to solve integration and differentiation problems (I1) • Select appropriate method to solve integration problems (I1) • Differentiate between the results of the integration methods (I11) • Select appropriate method to solve regression problems (I1) • Differentiate between the results of the various regression methods (I11)
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • Apply knowledge of mathematical methods to solve one variable equations problems (P1) • Apply knowledge of mathematical methods to solve one variable equations problems (P1) • Apply knowledge of mathematical methods to solve one variable equations problems (P1) • Students have to present one of the methods in the form of pseudo code (P12) • Analyze the errors on graphs using computer programs (P7) • Apply knowledge of mathematical methods to solve linear equations problems (P1) • Apply knowledge of mathematical methods to solve differentiation problems (P1) • Apply knowledge of mathematical methods to solve integration problems (P1) • Apply knowledge of mathematical methods to solve regression problems (P1)
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • NA

4- Course Content

Week No.1	Solution of equations of one variable: Bisection method, False Position method, and secant method.
Week No.2	Solution of equations of one variable: Successive Approximation method, and modified Successive Approximation method.
Week No.3	Solution of equations of one variable: Newton Raphson method and nearly equal roots.
Week No.4	Solution of equations of one variable: Berge Vieta method (of roots of polynomials).
Week No.5	Error Analysis and Propagation: Types and sources of errors and ill-conditioning and instability.

Week No.6	Error Analysis and Propagation: Process graphs, error propagation with examples.
Week No.7	Solutions of linear equations: (Direct Methods) Gauss elimination and Gauss Jordan methods.
Week No.8	Solutions of linear equations: (Direct Methods) Gauss Jordan method for Integral matrices.
Week No.9	Solutions of linear equations: (Indirect Methods) Jacobi, Gauss Siedel, and conditions of convergence.
WeekNo.10	Matrix Inversion using direct methods for solution of linear equations. Eigen values.
Week No.11	Numerical Interpolation (Linear, Quadratic, and Lagrange polynomials).
Week No.12	Numerical Differentiation and Integration (Mid-point integration).
Week No.13	Numerical Integration (Trapezoidal, Simpson, and Gaussian integration).
Week No.14	Linear and Quadratic regression.
Week No.15	Lagrange regression and revision.
Week No.16	Presentation of projects and Final Exam.

5- Teaching and Learning Methods

- Lectures
- Tutorials
- Reports and sheets
- Laboratories
- Seminars

6-Teaching and Learning Methods for Students with Special Needs

7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.	
b- Schedule:	Assessment 1 Assessment 2 Assessment 3 Assessment 4	7th Week Written Exam 12th Week Written Exam Continuous 16th Week Final Written Exam
c- Weighing of Assessment	7th Week Examination 12th Week Examination Final-term Examination Oral Examination Practical Examination Semester Work Total	30 % 20 % 40 % 00 % 00 % 10 % 100%

8- List of References:

a- Course Notes	
b- Required Books (Textbooks)	• Steven C. Chapra and Raymond P. Canale, “Numerical Methods for Engineers with Software and Programming Applications”, McGraw Hill, latest edition. •
c- Recommended Books	• Faire Burden, “Numerical Analysis”, PWS, latest edition. • Earl .E. Swartzlander, “Computer Arithmetic”, IEEE Computer Society Press.

	• Robert .F. Churchhouse, "Numerical methods hand book of applicable mathematics, John Wiley and Sons, latest edition.
d- Periodicals, Web Sites, etc.	

Course Instructor:
Prof.Dr. Abd ElMoneim Wahdan

Head of Department:
Prof. Dr. Ahmed Fahmy

Program Manager:
Prof. Dr. Ahmed Fahmy

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code:	**Course Title:**	**Academic Year/Level:**
EE 218	**Instrumentation and Measurements**	2nd year / 4th semester
	Prerequisites: EE 238 Elec. Eng. Fundamentals	
Specialization: Electrical and Control Engineering	**No. of Instructional Units:** 3	**Lecture** 2 **Practical** 2

2- Course Aim	To give the non- electrical students the basic concepts of control Engineering and to teach them the different control concepts , sensors , comparators , transducers , amplifiers
3- Intended Learning Outcome	
a- Knowledge and Understanding	K.5 Understanding the fundamentals of electrical measurements and various unit systems (SI units). K.5 Analyzing measurement errors, accuracy, static calibration, resolution and precision. K.5 Students should be familiar with static, dynamic and feedback characteristics for measuring devices. K.4 Understanding the construction and theory of operation of level, flow meter and physical signals measurements. K.3 Understanding the construction and theory of operation of displacement, velocity, force and torque instruments.

	K.3 Ability of understanding the fundamentals of pneumatic transducers and actuation methods for instrumentation.

b- Intellectual Skills	I.2, 3 Ability to select appropriate methods of measurements. I.5 Specify measuring instruments for construction engineers. I.6 Analyze and interpret measured data using statistics.
c- Practical and Professional Skills	P.1, 5, 6 Effectively use measuring instruments of physical quantities. P.6, 12 Performing laboratory experiments to evaluate static and dynamic characteristics of measuring instruments. P.8, 12 Apply safe operations of measuring instruments taking into consideration various constraints.
d- General and Transferable Skills	G.4 Preparing technical reports and present results on measurements. G.9 Using information technology (IT) to follow the continuous advancement in instrumentation technologies.

4- Course Content	*Accuracy of Measurement and error analysis I. *Accuracy of measurement and error analysis II. *Specifications of instrument. Physical measurement. Introduction to feedback system. Level Instruments (liquids). *7th week exam + Liquid flow instruments. Physical measurement (PH- viscosity). Displacement and velocity. Force and torque measurements. Data analysis. *12th week + Error detectors/ comparators. Electric/ Pneumatic transducers. Continued (amplifiers- transducers). * Actuation.
5- Teaching and Learning Methods	- Lectures - Tutorials - Discussion papers - Designing codes

6-Teaching and Learning Methods for Students with Special Needs	- Lectures - Tutorials - Reports and sheets - Laboratories - Seminars <u>Academic Support:</u> An academic supervisor for handicapped students is appointed. Constant follow up should be done for handicapped students after each assessment to evaluate their academic level of achievement

7- Student Assessment:		
a- Procedures used:	**Quiz (1) to asses part of the 7th week evaluation** **Quiz (2) to asses part of the 7th week evaluation** **Quiz (3) to asses part of the 7th week evaluation** **Quiz (4) to asses part of the 12th week evaluation** **Quiz (5) to asses part of the 12th week evaluation**	
b- Schedule:	**Assesssment 1** **Assesssment 2** **Assesssment 3** **Assesssment 4** **Assesssment 5**	**3rd Week** **5th Week** **7th Week** **12th Week** **14th Week**
c- Weighing of Assessment:	**7th Week Examination** **12th Week Examination** **Final-term Examination** **Oral Examination** **Practical Examination** **Semester Work** **Total**	**30%** **20%** **40%** **0%** **5%** **5%** **100%**

8- List of References:	•Helfrick, "Modern Electronic Instrumentation and Measurment", Prentice Hall, 2009 •Austin and Pickersgill " Instrumentation and control", 2005 •C.J. Chesmond "Basic control system technology " , 2008
a- Course Notes	Subjected in documentation
b- Required Books (Textbooks)	• Johnson,curst, "PROCESS CONTROL INSTRUMENTAION TECHNOLOGY ".PEARSON (8ED,2006)
c- Recommended Books	As textbook and reference books
d- Periodicals, Web Sites, ..., etc.	http://www.ieee.org

Course Coordinator

Name: **Dr. Hassan Ibrahim**

Signature:

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code:	**Course Title:**	**Academic Year/Level:**
EE 238	Electrical Engineering Fundamentals	2nd year / 3rd semester
	Prerequisites: BA 124 MathII	
Specialization: Mechatronics andcivil Engineering departments	**No. of Instructional Units:** 3	**Lecture** 2 **Practical** 2 **Tutorial/Lab** 2

2- Course Aim	- To inform the students with basic elements of electric circuits. - To apply the different methods of circuit analysis on dc circuits. - To introduce the concept of phasors to the students. - To inform the students with the waveform of ac circuits. .
3- Intended Learning Outcome	
a- Knowledge and Understanding	-(K1) Electrical circuit elements. -(K4,k5) Definition of Ohm's law and Kirchhoff's laws. -(k1,k14 EE .)Identification between concepts of series and parallel circuits. -(k1 ,k4 ,k5.)Distinguishing electrical network theorems. -(K1)Define magnetic terms and magnetic materials -(K4).Identify basics of ac generation and how ac voltage and currents differ from dc

b- Intellectual Skills	- (I1, I2, I13 EE.)Select appropriate methods to analyze and solve DC electrical circuits - (I1, I2, I7, I13 EE.) Apply mathematical, graphical and numerical techniques for solving electric circuits problems in steady state cases. - (I1) .Compute instantaneous sinusoidal voltage or current at any instant in time -(I2).Examine relationships between angular velocity (ω), frequency (f) and periodic time (T). - I1,12.Power calculation in sources and loads.
c- Practical and Professional Skills	- (P1, P5, P13 EE ,P14 EE) Perform laboratory experiments to verify various electric circuits' theories and laws. - (P1, P5, P6,P13 EE) Use computers in solving basic electric circuits.
d- General and Transferable Skills	- (G1, G6 ,G7)Work in small groups to perform basic electrical circuit's experiments. - (G6, G7, G9)Prepare reports on performed laboratory circuits.

4- Course Content	*Week Number 1:* Introduction *Week Number 2:* Basic circuit *Week Number 3:* Resistance, voltage, current, and ohm's law. *Week Number 4:* Kirchoff's laws. *Week Number 5:* Resistances in series or parallel. *Week Number 6:* Mesh analysis *Week Number 7:* 7th week exam + Node analysis *Week Number 8:* Source transformation *Week Number 9:* Superposition, voltage and current divider *Week Number 10:* Laws of magnetic force *Week Number 11:* Field strength, flux density. *Week Number 12:* 12th week exam + Relation between B, H, I, K *Week Number 13:* Alternating current. *Week Number 14:* Waves, effective value. *Week Number 15:* Power. *Week Number 16:* Final exam .
5- Teaching and Learning Methods	- Lectures - Tutorials - Reports and sheets - Laboratories

6-Teaching and Learning Methods for Students with Special Needs	- Lectures - Tutorials - Reports and sheets - Laboratories - Seminars <u>Academic Support:</u> An academic supervisor for handicapped students is appointed. Constant follow up should be done for handicapped students after each assessment to evaluate their academic level of achievement
7- Student Assessment:	**Quiz to asses part of the 7th and 12th week evaluation** **Report to asses part of practical evaluation**
a- Procedures used:	Written Examinations to asses The Intended Learning Outcomes Class Activities (Reports, Discussions, ------) to asses The Intellectual Skills

b- Schedule:	**Assesssment 1** **3rd Week** **Assesssment 2** **4th Week** **Assesssment 3** **5th Week** **Assesssment 4** **7th Week** **Assesssment 5** **10th Week** **Assesssment 6** **11th Week** **Assesssment 7** **12th Week**
c- Weighing of Assessment:	**7th Week Examination** **30%** **12th Week Examination** **20%** **Final-term Examination** **40%** **Practical Examination** **10%** **Total** **100%**
8- List of References:	▪ A. B Carlson, "Circuits, Engineering Concepts and Analysis of Linear Electric Circuits", John Wiley, 2000 ▪ R.L. Boylestad, "Introductory Circuit Analysis", Merril, London, 1994. ▪ W. J. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", McGraw Hill Int. Edition, 1986. ▪ D. E. Johnson, J. R. Johnson and J.L. Hilburn, "Electric Circuit Analysis", Prentice Hall, N. J. 1992. course objectives ▪
a- Course Notes	Subjected in documentation
b- Required Books (Textbooks)	Rissoni,Giorgio, "PROCESS CONTROL INSTRUMENTAION TECHNOLOGY", Mcgraw-Hill.5ED.2007
c- Recommended Books	As textbook and reference books
d- Periodicals, Web Sites, …, etc.	www.ieee.org

Course Coordinator

Name: **Prof.Dr Yasser Galal**

Signature:

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: IM111	**Course Title: Industrial Relations**	**Academic Year/Level:** 1st semester / 1st year
	Prerequisites: None	
Specialization:	**No. of instructional units:** **Lectures:** 2 **Practical:0**	

2- Course Aim	
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K7) Business and management principles relevant to engineering. Discuss the relationships between different departments in factories. Define the role of operation management Explain the techniques used for break even analysis. Define the elements of good forecast. Discuss the techniques of forecasting. Discuss the importance of inventory management. Explain technique to reduce inventory costs. Discuss the difference between economic order quantity and economic production quantity. Explain the meaning of quality control Discuss how to use quality charts

b- Intellectual Skills	I8) Select and appraise appropriate ICT tools to a variety of engineering problems. Analyze procedure for the development of new product. Evaluate optimum quantity for production Analyze the procedures for making forecast. Evaluate forecast values using different techniques. Identify different types of inventory. Evaluate the economic order quantity. Evaluate the economic production quantity. Analyze the use of sampling plans. Evaluate the stability of the process.
c- Practical and Professional Skills	NA
d- General and Transferable Skills	NA
4- Course Content	

Lecture		
Wk	Hrs	
1	2	Introduction for engineering ethics.
2	2	Case studies for engineering ethics.
3	2	Introduction for Production Cycle and new product development.
4	2	Operation Management responsibilities and cost accounting.
5	2	Examples and problems for cost accounting
6	2	Introduction to Forecasting
7	2	**Exam**
8	2	Forecasting techniques
9	2	Examples and problems for forecasting
10	2	Inventory Management Principles
11	2	Examples for inventory management and problems
12	2	Exam
13	2	Economic Production Quantity
14	2	Term project
15	2	. Revision
16	2	Final Exam

5- Teaching and Learning Methods	1. Lectures 2. problems 3. Individual and group course homework
6- Teaching and Learning Methods for Students with Special Needs	1. Consulting with lecturer during office ours 2. Consulting with Lecturer during office hours 3. Private sessions for redelivering the lecture contents
7- Student Assessment	
a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. 2. Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills.
b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Practical Examination : 0 % Semester Work : 10 % Total : 100%
8- List of References:	
a- Course Notes	Prepared by Lecturer
b- Required Books (Textbooks)	
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Issuer:

Course coordinator: Dr. Bassem Roushdy

Program Manager:

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy:	Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute:	College of Engineering and Technology
Program:	Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code:	**Course Title:**	**Academic Year/Level:**
IM 112	Manufacturing Technology	2nd semester / 1st year
	Prerequisites: None	
Specialization:	**No. of instructional units:** **Lectures:** 1 **Practical: 1**	

2- Course Aim	- Define basic manufacturing processes. - Define basic classifications for engineering materials and their properties. - Define the requirements and applications of different manufacturing processes. - Define joining operations in manufacturing.
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K3) Characteristics of engineering materials related to the discipline. Define different properties of engineering materials Define basic classification of metals and their effect on properties. Identify different types of polymers and their properties. K4) Principles of design including elements design, process and/or a system related to specific disciplines. Define properties required for different

	applications. Define casting concepts. Identify different casting techniques. Define the concepts of casting mold design and permanent mold casting. Define different bulk deformation processes and their applications. Define sheet metal forming processes. Define different machining processes. Define tool life concepts and different factors affecting tool life. Identify different types of welding operations and their applications. Define different plastic processing techniques. Define manufacturing concepts. Define basic classification for manufacturing processes.
b- Intellectual Skills	NA
c- Practical and Professional Skills	NA
d- General and Transferable Skills	NA
4- Course Content	

Lecture		
Wk	Hrs	
1	2	Introduction to manufacturing.
2	2	Physical and mechanical properties of materials.
3	2	Classification of materials, metals and their alloys.
4	2	Polymers and composites.
5	2	Metal casting
6	2	Metal casting (cont.), mold and riser design, die casting
7	2	7th Exam
8	2	Metal forming (Rolling, Extrusion and Drawing).
9	2	Metal forming (cont.), sheet metal work.
10	2	Machining operations.
11	2	Tool life and materials
12	2	12th Exam
13	2	Joining operations
14	2	Shaping of plastics
15	2	. Revision.
16	2	Final Exam

5- Teaching and Learning Methods	1. Lectures 2. Tutorials 3. Individual and group coursework 4. Project group technical reports Individual and group projects
6- Teaching and Learning Methods for Students with Special Needs	1. Consulting with lecturer during office hours 2. Consulting with teaching assistant during office hours
7- Student Assessment	
a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. Continuous assessment (reports, discussions, etc……).
b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 5 % Semester Work : 5 % Total : 100%
8- List of References:	
a- Course Notes	
b- Required Books (Textbooks)	
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Issuer:

Course coordinator:

Program Manager:

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy:	Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute:	College of Engineering and Technology
Program:	Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: NE 446	**Course Title:** **Environmental Science and Technology**	**Academic Year/Level:** 7th semester / 4th year
	Prerequisites: None	
Specialization:	**No. of instructional units:** **Lectures:** **Practical:**	

2- Course Aim **To introduce the concepts and terminology required for environmental engineering practice.** **Understanding of the social, cultural, economical and environmental responsibilities of the professional engineer, and the need for sustainable development**	
3- Intended Learning Outcome (ILO's)	

a- Knowledge and Understanding	K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. - Discuss the fundamental basic of environmental management systems - Discuss the fundamental basic of environmental management systems - Explain a technique that can be used to minimize the risk K2) Basics of information and communication technology (ICT) - Recall basic information on environment K4) Principles of design including elements design, process and/or a system related to specific disciplines. - Define objectives and functional requirements of a resource efficiency - Identify objectives and functional requirements of a system, process or component K6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. - Identify different environmental management systems, causes and standards, health and safety requirements and environmental issues K11) Professional ethics and impacts of engineering solutions on society and environment - Discuss the fundamental concept of environmental problems
b- Intellectual Skills	I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. - Select appropriate mathematical and computer based models for modelling and analyzing problems I2) Select appropriate solutions for engineering problems based on analytical thinking. - Select appropriate solution for environmental and health problems I3) Think in a creative and innovative way in problem solving and design. - Combine exchange and assess different ideas, views and knowledge from a range of sources - Analyze different ideas, views and knowledge from a range of sources I4) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. - Assess and evaluate the characteristics and performance of component - Evaluate resources sustainable consumptions I6) Investigate the failure of components, systems, and processes. - Solve the environmental degradation I7) Solve engineering problems, often on the basis of limited and possibly contradicting information. - Select and appraise appropriate environmental management system tools to variety of environmental engineering problems I9) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.

	- Use economic, social, environment and risk factor in design
c- Practical and Professional Skills	P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. - Apply knowledge of mathematics , science and information technology to reduce disaster risk P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. - Combine engineering knowledge to improve design product and service P3) Create and/or re-design a process, component or system, and carry out specialized engineering designs. - Create and/or redesign a process, component and carry out specialized environmental engineering design P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs. - Use wide range of analytical tools, techniques, equipment and software to develop required programs P8) Apply safe systems at work and observe the appropriate steps to manage risks. - Apply safe and sustainable systems at work P10) Apply quality assurance procedures and follow codes and standards. - Apply quality assurance procedures , standards and laws - Apply quality environmental management system procedures and follow codes and standards
d- General and Transferable Skills	G1) Collaborate effectively within multidisciplinary team. - Collaborate effectively within multi-disciplinary team G2) Work in stressful environment and within constraints. - Work in stressful environment and within constraints G3) Communicate effectively. - Assess communication effectively

4- Course Content

Lecture		
Wk	Hrs	
1	2	**Environmental Development within the last decade (Environmental Conventions, Local Environmental Law)**
2	2	**Environmental and ecological systems resources efficiency, sustainable consumption and production**
3	2	**The development of human awareness regarding environment problems**
4	2	**Populations, health and environment**
5	2	**Development and the environment**
6	2	**Environment ,Life Cycle Approaches and Indicators**
7	2	**2 hrs revisions and 2 hrs the seventh week exam**
8	2	**Environment and sustainable development**
9	2	**Poverty and the environment**
10	2	**Climate change adaptation and mitigation**
11	2	**Disaster Risk Reduction**
12	2	**Discussion of reports as a 12th week exam**
13	2	**Environmental improvement**
14	2	**Economic and social returns/ benefits of pollution abatement**
15	2	**Environmental and ecosystem management**
16	2	**Final exam**

5- Teaching and Learning Methods

1. Lectures
2. Individual and group course homework

6- Teaching and Learning Methods for Students with Special Needs

1. Consulting with lecturer during office ours
2. Consulting with teaching assistant during office hours
3. Private sessions for redelivering the lecture contents

7- Student Assessment

a- Procedures used:

1. Written examinations to assess the Intended learning outcomes.
   Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills.

b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Practical Examination : 0 % Semester Work : 10 % Total : 100%
8- List of References:	
a- Course Notes	Prepared by Lecturer
b- Required Books (Textbooks)	
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Issuer:

Course coordinator: Dr. Adel Mahmoud Belal

Program Manager:

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: NE264	**Course Title:** Scientific Thinking. **Prerequisites: None**	**Academic Year/Level:** 4th semester / 2nd year
Specialization: Communication, Construction, Power, MECHATRONICS.	**No. of instructional units:** 6 **Lectures:** 2	

2- Course Aim	**1-Recognize meaning of the thinking.** **2- Identify the thinking Patterns development.** **3- Explain the Construction of Science.** **4-Discuss the Properties of science.** **5-List the mental operation used in science.** **6-- Formulate the Scientific Postulates to solve a specific problem.** **7-Create some Inference from given information and data.** **9-Use creative thinking skills in real situations.** **10-Organize an effective Visual presentation.** **11-Use the stage of scientific inquiry in business.** **12-Revise the results of scientific knowledge.** **13-Interpret the data of engineering problems .** **14-use the brain storming to solve engineering problems .** **15-design the projects in fields of engineering sciences.** **16-Apply scientific thinking skills to solve engineering problems.** **17-Employ the stage of decision making in real situations.** **18- Develop Creative thinking skills of engineering students.**

	19-Apply the Creative thinking techniques to solve engineering problems . **20-Develop Communication skills of engineering students.**
3- Intended Learning Outcome (ILO's)	
a- Knowledge and Understanding	K5) Methodologies of solving engineering problems, data collection and interpretation K9) Topics related to humanitarian interests and moral issues. K11) Professional ethics and impacts of engineering solutions on society and environment
b- Intellectual Skills	I2) Select appropriate solutions for engineering problems based on analytical thinking. I3) Think in a creative and innovative way in problem solving and design.
c- Practical and Professional Skills	P9) Demonstrate basic organizational and project management skills. P11) Exchange knowledge and skills with engineering community and industry.
d- General and Transferable Skills	G1) Collaborate effectively within multidisciplinary team. G3) Communicate effectively. G5) Lead and motivate individuals. G6) Effectively manage tasks, time, and resources. G7) Search for information and engage in life-long self learning discipline.
4- Course Content	

Lecture		
Wk	**Hrs**	**Description**
1	**2**	**Meaning andConstruction Science + Scientific Values andDirections.**
2	**2**	**Properties of Scientific Thinking.**
3	**2**	**Science ,non- Science and other-than Science + Science , Engineering and Technology+ Basic Presentation Skills.**
4	**2**	**Properties of Science.**
5	**2**	**Objectives of science + Postulates of Scientific thinking.**
6	**2**	**Mental operation used in science+ Scientific Guessing +Types of deductions+ Representation**
7	**2**	**7th Week Exam.**
8	**2**	**Research Methods in mathematical sciences + Postulates , definitions .**

9	2	Research Methods in natural sciences.
10	2	Experiments and Observations+ Scientific Postulates and their conditions + Verification of Scientific Postulates
11	2	problem solving + general Methods of problem solving .
12	2	12th Week Exam.
13	2	Creative Thinking +Fluency types
14	2	Flexibility and Originality and **Elaboration** + Basic of brain storming.
15	2	Revision
16	2	Final Exam

5- Teaching and Learning Methods	1.Lectures. 2. Discussion. 3. Brain Storming 4. Collaborative Learning 5.Tink-Pair-Share. 6- Brain storming 7. Multimedia / presentation 8.Problem Solving
6- Teaching and Learning Methods for Students with Special Needs	1-Individually Prescriptive Instruction. 2- Individually Guided Instruction. 3-Diagnostic Prescribed Instruction. 4-Micro Teaching.
7- Student Assessment	
a- Procedures used:	1- Written examinations to assess the ended learning outcomes. 2- Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills. 3- Visual presentation to assess the Professional skills.
b- Schedule:	Assessment 1: 7th Week Written Exam. Assessment 2: 12th Week Written Exam. Assessment 3: Continuous Assessments. Assessment 4: Visual presentation.

	Assessment 5: 16th Week Final Written Exam.
c- Weighing of Assessment:	**7th Week Examination : 30 %** **12th Week Examination: 10 %** **Final-term Examination: 40 %** **Visual presentation: 10 %** **Semester Work : 10 %** **Total : 100%**
8- List of References:	
a- Course Notes	**Hamada ,M.: Scientific Thinking, AASTMT.**
b- Required Books (Textbooks)	References available in the Academy library.
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Issuer:

Course coordinator: Ass .Dr. Mohamed Hamada
Program Manager: Prof. Dr. Samir Youssef

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 311	Course Title: **Introduction to Construction Management**	**Academic Year/Level:** 3rd year / 6th Semester
	Prerequisites: BA224 Math IV	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The aim of this course is to introduce the student to the construction industry challenges and the need for scientific management in the field. The course then focus on introducing the knowledge of engineering economy and the economic comparison among alternatives in addition to feasibility studies for construction projects.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K7) Realize the business and management principles relevant to construction engineering and engineering economy. • K17) Explain the main project management processes, including, bidding, contract procedures, planning, estimating, scheduling, project financing and quality systems.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I2) Think in a creative and innovative way in problem solving and design. • I3) Assess different alternatives, views, and knowledge from a range of sources. • I4) Evaluate the characteristics and performance of components, systems and processes. • I17) Interpret financial information.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P16) Use appropriate computer-based support tools and software packages for problem-solving and analysis of results.

d- General and Transferable Skills	**N/A**
4- Course Content	Week No. 1-3: Introduction to construction management (1,2,3). Week No. 4: Introduction to engineering economic analysis. Week No. 5: Equivalence: Cash flow diagram and principle of equivalence. Week No. 6: Measures of worth: Net cash flow, present worth, future worth. Week No. 7: 7th week Exam. Week No. 8: Measures of worth (continued): Annual worth, internal rate of return. Week No. 9-10: Comparison of alternatives: economic evaluation and comparison of different alternatives (1,2). Week No. 11: Sensitivity analysis: Break even analysis, single parameter sensitivity. Week No. 12: 12th week Exam Week No. 13-14: Feasibility studies: Elements of feasibility study, marketing, technical, environmental, economic and financial feasibility (1,2). Week No. 15: Public projects: the economic evaluation of public construction projects. Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Computer sessions • Reports
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Computer sessions • Reports Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents.

7- Student Assessment:

a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Case study/Report**

b- Assessment Schedule:

Assessment	Week	Points
7th week assessment		**(30 points)**
• 3 Assignments	(2, 4, and 6)	(6 points)
• 3 Quizzes (best 2)	(2, 4, and 6)	(4 points)
• Written exam	7	(20 points)
12th week assessment		**(20 points)**
• 2 Assignments	(9 and 11)	(2 points)
• 2 Quizzes	(9 and 11)	(3 points)
• Written exam	12	(15 points)
Semester work assessment		**(10 points)**
• Attendance	1 to 15	(3 points)
• Case Study/Report	14	(7 points)

	Final exam		**(40 points)**
	• Final written exam	16	(40 points)
c- Weighing of Assessments:	7th week Assessment		30 %
	12th week Assessment		20 %
	Semester work Assessment	3 % + 7% =	10 %
	Final Examination		40 %
	Total		**100%**

8- List of References:	
a- Course Notes	N/A
b- Required Books (Textbooks)	• MODERN CONSTRUCTION MANAGEMENT(6ED.)-(HARRIS, FRANK C) by BLACKWELL PUBLISHING 2006
c- Recommended Books	• A Guide to the Project Management Body of Knowledge (Pmbok Guide) - 5th Edition by Project Management Institute (Jan 1 2013). • Construction Project Administration 10th Edition by Edward R. Fisk and Wayne D. Reynolds, Prentice Hall (July 2013). • Construction Management 4th Edition by Halpin, D. W., Publisher: John Wiley and Sons, (2011). • Project Management in Construction 6th Edition by Levy, S.M. McGraw Hill Inc., N.Y., USA (Aug 2011).
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Dr. Ahmed el yamani

Course Coordinator:
Dr. Ahmed Abdelmoty Elhakeem

Head of Department:
Prof. Adel Mahmoud Belal

Assessment Tools	Course ILOs								
	Knowledge and Understanding (K)		Intellectual Skills (I)					Practical and Professional Skills (P)	
	7	17	1	2	3	4	17	1	16
Written Tests/quizzes	x	x		x	x	x		x	
Reports			x	x			x	x	x
Assignments			x	x	x	x	x	x	

Learning Strategy	Course ILOs								
	Knowledge and Understanding (K)		Intellectual Skills (I)					Practical and Professional Skills (P)	
	7	17	1	2	3	4	17	1	16
Lectures	x	x	x			x	x	x	
Self-Learning				x					
Projects							x		x
Problem Solving session				x				x	
Computer session			x						x
Seminar and Discussion session	x	x			x		x		

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 312	**Course Title:** Systems Analysis in Construction	**Academic Year/Level:** 3rd year / 6th Semester
	Prerequisites: BA329 probability and statistics	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the fundamentals of systems analysis and its application in the construction engineering and management domain.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Identify the concepts and theories of mathematics and sciences, appropriate to the discipline. • K5) Recognize the methodologies of solving engineering problems, data collection and interpretation.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I2) Think in a creative and innovative way in problem solving and design. • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information. • I10) Analyze results of numerical models and assess their limitations. • I12) Identify and solve construction engineering problems.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P6) • P16) Use appropriate computer-based support tools and software packages for problem-solving and analysis of results.

	• P20) Schedule work to meet multiple deadlines in complex activities.
d- General and Transferable Skills	**NA**

4- Course Content	Week No. 1: Introduction to the mathematical models. Week No. 2: Formulation of the linear programming models. Week No. 3: Solving LP models using the graphical solution. Week No. 4: Solving LP models using the simplex method. Week No. 5: The transportation problems. Week No. 6: The assignment problems. Week No. 7: 7th week exam Week No. 8: Utility estimation and decision making based on utility optimization. Economic aspects. Week No. 9: Resource allowance, minimum cost models, maximum output models. Week No. 10: The optimization of resource utilization, and formulation and solving of minimum cost and maximum output models. Week No. 11: Resource allowance, minimum cost models, maximum output models (continued). Week No. 12: 12th week exam. Week No. 13: The optimization of resource utilization, and formulation and solving of minimum cost and maximum output models. Week No. 14: Resource allowance, minimum cost models, maximum output models (continued). Week No. 15: The optimization of resource utilization, and formulation and solving of minimum cost and maximum output models. Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Case study/Report**

b- Assessment Schedule:	**Assessment**	**Week**	**Points**
	7th week assessment		**(30 points)**
	• 3 Assignments	(2, 4, and 6)	(6 points)

	• 3 Quizzes (best 2)	(2, 4, and 6)	(4 points)
	• Written exam	7	(20 points)
	12th week assessment		**(20 points)**
	• 2 Assignments	(9 and 11)	(2 points)
	• 2 Quizzes	(9 and 11)	(3 points)
	• Written exam	12	(15 points)
	Semester work assessment		**(10 points)**
	• Attendance	1 to 15	(3 points)
	• Case Study/Report	14	(7 points)
	Final exam		**(40 points)**
	• Final written exam	16	(40 points)

c- Weighing of Assessments:	7th week Assessment		30 %
	12th work Assessment		20 %
	Semester work assessment	3 % + 7% =	10 %
	Final Exam		40 %
	Total		**100%**

8- List of References:

a- Course Notes	Lecture slides will be provided frequently when available
b- Required Books (Textbooks)	AN INTRODUCTION TO MANAGEMENT SCIENCE: QUANTITATIVE APPROACHES TO DECISION MAKING ANDERSON, DAVID R CENGAGE LEARNING 1 2009
c- Recommended Books	Quantitative Techniques for Decision Making in Construction by Tang, S. L., Ahmad, I. U., Ahmed, S. M., and Ming, L. Publisher: Hong Kong University Press, 2004. Introduction to Operations Research by Ecker, J.G., Kupferschmid, M. Publisher: Krieger Publishing Co., Malabar, Fl., USA, (1988).
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Ahmed Abdelmoty Elhakeem

Course Coordinator:

Dr. Ahmed Abdelmoty Elhakeem

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs									
	Knowledge and Understanding (K)		Intellectual Skills (I)					Practical and Professional Skills (P)		
	1	5	1	2	6	10	12	1	16	20
Written Tests	x	x		x	x			x		
Reports		x	x	x		x	x	x	x	x
Assignments	x	x	x	x	x		x	x		

Learning Strategy	Course ILOs									
	Knowledge and Understanding (K)		Intellectual Skills (I)					Practical and Professional Skills (P)		
	1	5	1	2	6	10	12	1	16	20
Lectures	x	x	x			x	x	x		
Self-Learning				x						x
Projects									x	
Problem Solving session				x	x		x	x		x
Computer session			x						x	

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 313	Course Title: **Quality Control in Construction**	**Academic Year/Level:** 3rd year / 6th Semester
	Prerequisites: BA329probabilty and statistics	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the fundamentals of quality control in construction.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K5) Recognize the methodologies of solving engineering problems, data collection and interpretation • K6) Realize quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. • K11) Know the professional ethics and impacts of engineering solutions on society and environment.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I4) Assess the characteristics and performance of components, systems and processes. • I5) Investigate the failure of components, systems, and processes. • I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. • I12) Solve construction engineering problems.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P8) Apply safe systems at work and observe the appropriate steps to manage risks. • P10) Apply quality assurance procedures and follow codes and standards. • P12) Prepare technical reports.

d- General and transferable Skills	**N/A**
4- Course Content	• Week No. 1-2: Introduction to quality in construction (1,2): • Week No. 3: Inspection and testing in construction projects. The documentation and function of quality control engineers in construction sites. • Week No. 4: Quality improvement techniques: • Week No. 5: Review of statistics: • Week No. 6-7: Control charts for variables (1,2) and7th week exam • Week No. 8: Evaluation of strength test results of concrete, variation and analysis of strength data, Criteria and evaluation of data, quality control charts for strength data and other evaluation techniques. • Week No. 9: Quality assurance: ISO 9000 / Introduction. • Week No. 10: Quality assurance: ISO 9000 / Development of QMS, objective, benefits. • Week No. 11-12:Quality assurance: Clauses in ISO 9000 / 2000 version. and 12th week exam • Week No. 13-14:Total quality management: • Week No. 15: Case Studies: • Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets

6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents

7- Student Assessment:

a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Case study/Report**

b- Assessment Schedule:

Assessment	Week	Points
7th week assessment		**(30 points)**
• 3 Assignments	(2, 4, and 6)	(6 points)
• 3 Quizzes (best 2)	(2, 4, and 6)	(4 points)
• Written exam	7	(20 points)
12th week assessment		**(20 points)**
• 2 Assignments	(9 and 11)	(2 points)
• 2 Quizzes	(9 and 11)	(3 points)
• Written exam	12	(15 points)
Semester work assessment		**(10 points)**
• Attendance	1 to 15	(3 points)
• Case Study/Report	14	(7 points)
Final exam		**(40 points)**
• Final written exam	16	(40 points)

c- Weighing of Assessment:

7th week Assessment		30 %
12th work Assessment		20 %
Semester work assessment	3 % + 7% =	10 %
Final Exam		40 %
Total		**100%**

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	• QUALITY IMPROVEMENT (9 ED.) by Dale H. Besterfield, Pearson education 2014
c- Recommended Books	• Quality Improvement Techniques in Construction by McCabe, S. Publisher: Addison Wesly Longman limited, Edinburgh Gate, England, 1998. • Modern Construction Management, 7th Edition by McCaffer, R., Harris, F. and Edum-Fotwe, F. Wiley-Blackwell (April 2013). • Quality Management in Construction, 3rd Edition by Thorpe, Brian and Sumner, Peter Gower Pub Co , UK, (Jan 2005).

	• Engineering Quality in Construction: Partnering and TQM by Kubal, M.T. Publisher: McGraw Hill Inc., New York, (Mar 1994).
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Magid Abd el ghafar mousa

Course Coordinator:

Dr. Ahmed Abdelmoty Elhakeem

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs										
	Knowledge and Understanding (K)			Intellectual Skills (I)					Practical and Professional Skills (P)		
	5	6	11	1	4	5	8	12	8	10	12
Written Tests	x				x			x		x	
Reports	x	x	x	x		x	x	x	x	x	x
Assignments	x			x	x			x			

Learning Strategy	Course ILOs										
	Knowledge and Understanding (K)			Intellectual Skills (I)					Practical and Professional Skills (P)		
	5	6	11	1	4	5	8	12	8	10	12
Lectures	x	x		x	x			x	x	x	
Self-Learning			x								x
Projects			x			x	x				x
Problem Solving session				x			x	x			

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 415	Course Title: **Quantity Surveying, Cost Estimating and Specifications**	**Academic Year/Level:** **4th** year / **8th** Semester
	Prerequisites: CB322 & CB354	
Specialization: **Construction and Building Engineering**	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the fundamentals of quantity surveying, cost estimating and specifications
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K5) Realize the methodologies of solving engineering problems, data collection and interpretation • K10) Express the technical language and report writing • K17) Realize projects management, including planning, finance, bidding, contract procedures, cost estimators and quality systems.
b- Intellectual Skills	**N/A**
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P9) Demonstrate basic organizational and project management skills. • P18) Prepare quantity surveying reports, cost estimates, and construction schedules.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G7) Search for information and engage in life-long self learning discipline.

4- Course Content	Week No. 1: Introduction to quantity surveying: Importance of quantity surveying in construction cost estimating, and its role in scheduling. Week No. 2: Quantity surveying of earthworks and earth structures: Week No. 3-4: Quantity surveying of buildings (1,2): Week No. 5-6: Quantity surveying of reinforced concrete skeleton in buildings Week No. 7: 7th week exam and Quantity surveying of reinforced concrete skeleton in buildings; Week No. 8: Quantity surveying of civil engineering projects: Week No. 9: Introduction to cost estimating: Week No. 10: Direct and indirect costs: Week No. 11: Markup, profits and pricing: Week No. 12-13: Applications and term projects (1,2): Week No. 14-15: Construction specification writing, types and uses Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents.

7- Student Assessment:

a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Case study/Report**

b- Assessment Schedule:	**Assessment**	**Week**	**Points**
	7th week assessment		**(30 points)**
	• 3 Assignments	(2, 4, and 6)	(6 points)
	• 3 Quizzes (best 2)	(2, 4, and 6)	(4 points)
	• Written exam	7	(20 points)
	12th week assessment		**(20 points)**
	• 2 Assignments	(9 and 11)	(2 points)
	• 2 Quizzes	(9 and 11)	(3 points)
	• Written exam	12	(15 points)
	Semester work assessment		**(10 points)**
	• Attendance	1 to 15	(3 points)
	• Case Study/Report	14	(7 points)
	Final exam		**(40 points)**

	• Final written exam	16	(40 points)
c- Weighing of Assessments:	7th week Assessment		30 %
	12th work Assessment		20 %
	Semester work assessment	3 % + 7% =	10 %
	Final Exam		40 %
	Total		**100%**
8- List of References:			
a- Course Notes	N/A		
b- Required Books (Textbooks)	• Fundamentals of Construction Estimating 3rd Edition, by Pratt, David, Delmar Publishers Inc , (June 2010)		
c- Recommended Books	• Project Management in Construction 6th Edition by Levy, S.M. McGraw Hill Inc., N.Y., USA (Aug 2011). • Construction Specifications Writing: Principles and Procedures, 6th Edition by Mark Kalin, Robert S. Weygant, Harold J. Rosen, John R. Regener Wiley (April 2010) • Estimating Construction Costs 6th Edition by Peurifoy R.L. McGraw Hill, N.Y., USA, (Jan 2013). • Building Construction Cost Data (Means Building Construction Cost Data) 72nd Edition by Waier, Phillip, R. Publisher: R.S. Means Company, USA, (2013).		
d- Periodicals, Web Sites, ..., etc.	N/A		

Course Instructor:

Dr. Ahmed el yamani

Course Coordinator:

Dr. Ahmed Abdelmoty Elhakeem

Head of Department:

Dr. Adel Mahmoud Belal.

Assessment Tools	Course ILOs					
	Knowledge and Understanding (K)			Practical and Professional Skills (P)		General and Transferable Skills (G)
	5	10	17	9	18	7
Written Tests/quizzes	x	x	x		x	
Reports	x	x		x		x
Assignments	x		x	x		

Learning Strategy	Course ILOs					
	Knowledge and Understanding (K)			Practical and Professional Skills (P)		General and transferable Skills (G)
	5	10	17	9	18	7
Lectures	x	x	x	x		
Self-Learning						x
Projects		x			x	
Problem Solving session			x	x	x	
Seminar and Discussion session			x			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 514	Course Title: **Construction Contracts and Law**	**Academic Year/Level:** **5th** year / **9th** Semester
	Prerequisites:CB311 & CB415	
Specialization: **Construction and Building Engineering**	**No. of Instructional Units:** **Lecture** 2 **Practical** 1 **Lab** 1	

2- Course Aim	The course aims at introducing the student to the fundamentals of contracting and Law and its application to the construction industry.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K6) Realize quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. • K7) Know business and management principles relevant to engineering. • K17) Recognize projects management, including planning, finance, bidding, contract procedures, cost estimators and quality systems.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I4) Assess and evaluate the characteristics and performance of components, systems and processes. • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information. • I15) Integrate information and processes through individual and group project work.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P8) Apply safe systems at work and observe the appropriate steps to manage risks. • P9) Demonstrate basic organizational and project management skills. • P10) Apply quality assurance procedures and follow codes and standards. • P12) Prepare technical reports.

	• P19) Administer contracts • P19) Control time, cost and quality of projects.
d- General and Transferable Skills	**N/A**
4- Course Content	Week No. 1: Introduction. Week No. 2: The bidding process and bidding requirements. Week No. 3: Principles and basics of construction contracting. Week No. 4- 5: Types of construction contracts (1,2). Week No. 6: Selection of construction contract. Week No. 7-8: 7th exam and Contract documents (1,2). Week No. 9-10: Project delivery systems (1,2). Week No. 11: Introduction to building and construction law (law 89 for the Egyptian law vs. FIDIC). Week No. 12-13: 12th exam and Legal aspects associated with construction projects. Week No. 14-15: Construction claims and Teamwork Report Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents

7- Student Assessment:

a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Case study/Report**		
b- Assessment Schedule:	**Assessment**	**Week**	**Points**
	7th week assessment		**(30 points)**
	• 3 Assignments	(2, 4, and 6)	(6 points)
	• 3 Quizzes (best 2)	(2, 4, and 6)	(4 points)
	• Written exam	7	(20 points)
	12th week assessment		**(20 points)**
	• 2 Assignments	(9 and 11)	(2 points)
	• 2 Quizzes	(9 and 11)	(3 points)
	• Written exam	12	(15 points)
	Semester work assessment		**(10 points)**
	• Attendance	1 to 15	(3 points)
	• Case Study/Report	14	(7 points)
	Final exam		**(40 points)**

	• Final written exam	16	(40 points)
c- Weighing of Assessments:	7^{th} week Assessment 12^{th} work Assessment Semester work assessment Final Exam **Total**	3 % + 7% =	30 % 20 % 10 % 40 % **100%**
8- List of References:			
a- Course Notes	N/A		
b- Required Books (Textbooks)	• Engineering Management, 1st Edition by Fraidoon Mazda, "Prentice Hall, (Oct 1997).		
c- Recommended Books	• Construction Contracts: Law and Management, 4th Edition by Hughes, W, Champion, R . and Murdoch, J. Routledge (March 2008). • Construction Forms and Contracts by Savage, C., Mitchell K. J. Publisher: Craftsman Book Company, (1994). • Construction Contracts, 3^{rd} Edition by Hinze, J. McGraw-Hill Science, USA, (Sept 2010). • Fidic Conditions of Contract for Construction Publisher: Red Book, FIDIC.		
d- Periodicals, Web Sites, ..., etc.	N/A		

Course Instructor:

Dr. Ahmed Abdel Atti Gaballah

Course Coordinator:

Dr. Ahmed Abdelmoty Elhakeem

Head of Department:

Dr. Adel Mahmoud Belal.

Assessment Tools	Course ILOs											
	Knowledge and Understanding (K)			Intellectual Skills (I)				Practical and Professional Skills (P)				
	6	7	17	2	4	6	15	8	9	10	12	19
Written Tests/quizzes		x	x	x	x	x			x	x		
Reports	x			x			x	x	x	x	x	x
Assignments				x	x	x			x			x

Learning Strategy	Course ILOs											
	Knowledge and Understanding (K)			Intellectual Skills (I)				Practical and Professional Skills (P)				
	6	7	17	2	4	6	15	8	9	10	12	19
Lectures	x	x	x		x			x		x		
Self-Learning				x			x				x	x
Projects							x				x	x
Problem Solving session				x		x						
Seminar and Discussion session		x	x						x			x

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 516	**Course Title:** Construction Project Management I **Prerequisites:CB311 & CB322**	**Academic Year/Level:** 5th year / 9th Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at providing the students with the necessary skills to plan, schedule and monitor construction projects.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K5) Recognize ,methodologies of solving engineering problems, data collection and interpretation • K7) Realize business and management principles relevant to engineering. • K14) Know principles of construction and building engineering sciences as applied to civil engineering principles; • K17) Arrange projects management processes, including planning, finance, bidding, contract procedures, cost estimators and quality systems.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I12) Identify and solve construction engineering problems.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P9) Demonstrate basic organizational and project management skills. • P16) Use appropriate computer-based support tools and software packages for problem-solving and analysis of results. • P18) Prepare quantity surveying reports, cost estimates, and construction schedules. • P19) Administer contracts

	• P19) Control time, cost and quality of projects. • P20) Schedule work to meet multiple deadlines in complex activities.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G3) Communicate effectively. • G4) Demonstrate efficient IT capabilities. • G7) Search for information and eng age in life-long self learning discipline.
4- Course Content	Week No. 1: Introduction to planning and scheduling Week No. 2-3: Planning: Network Diagrams – WBS, Activities, Logic, network representation, activities time and cost. Week No. 4-6: Scheduling techniques: Bar charting, AOA, AON, LOB. Week No. 7-8: 7th week evaluation, Schedule application on computer software. Week No.9: Probabilistic scheduling Week No.10: Resource allocation Week No.11- 12: Resource leveling, 12th week evaluation Week No. 13: Project time reduction: Crashing and Time-cost trade off. Week No.14: Project finance and Cash-flow forecasting and analysis Week No.15: Project control: Earned Value.and Presentation Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets • Computer Sessions • Projects / Presentations
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets • Computer Sessions • Presentations Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents

7- Student Assessment:

a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Case study/Report**
b- Assessment Schedule:	**Assessment** — **Week** — **Points** **7th week assessment** — **(30 points)** • 3 Assignments — (2, 4, and 6) — (6 points) • 3 Quizzes (best 2) — (2, 4, and 6) — (4 points) • Written exam — 7 — (20 points) **12th week assessment** — **(20 points)** • 2 Assignments — (9 and 11) — (2 points)

	• 2 Quizzes	(9 and 11)	(3 points)
	• Written exam	12	(15 points)
	Semester work assessment		**(10 points)**
	• Attendance	1 to 15	(3 points)
	• Case Study/Report	14	(7 points)
	Final exam		**(40 points)**
	• Final written exam	16	(40 points)
c- Weighing of Assessment:	7^{th} week Assessment		30 %
	12^{th} work Assessment		20 %
	Semester work assessment	3 % + 7% =	10 %
	Final Exam		40 %
	Total		**100%**
8- List of References:			
a- Course Notes	Lecturing slides may be provided		
b- Required Books (Textbooks)	N/A		
c- Recommended Books	Construction Scheduling Principles and Practices, 2nd Edition by Newitt, J., Prentice Hall, 2008 Project Scheduling and Management for Construction, 4th Edition by Pierce, D.: RSMeans, USA, (Sept 2013) Project Planning and Scheduling using Primavera Contractor, Ver. 4.1, for the Construction Industry by Feigenbaum, L., Publisher: John Wiley and Sons, 2005.		
d- Periodicals, Web Sites, ..., etc.	N/A		

Course Instructor:
Dr. Ibrahim Abd el Rashed

Course Coordinator:
Dr. Ahmed Abdelmoty Elhakeem

Head of Department:

Dr. Adel Mahmoud Belal.

Assessment Tools	Course ILOs													
	Knowledge and Understanding (K)				Intellectual Skills (I)		Practical and Professional Skills (P)					General and Transferable Skills (G)		
	5	7	14	17	2	12	9	16	18	19	20	3	4	7
Written Tests/quizzes	x	x	x	x	x		x		x					
Reports	x				x	x	x	x	x	x	x	x	x	x
Assignments	x		x		x	x	x		x	x			x	

Learning Strategy	Course ILOs													
	Knowledge and Understanding (K)				Intellectual Skills (I)		Practical and Professional Skills (P)					General and Transferable Skills (G)		
	5	7	14	17	2	12	9	16	18	19	20	3	4	7
Lectures	x	x	x	x		x	x		x					
Self-Learning					x					x	x			x
Projects								x	x	x		x	x	
Problem Solving session			x		x	x			x		x			
Computer session								x	x				x	
Seminar and Discussion session		x		x						x				

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 519	Course Title: **Construction Project Management II**	**Academic Year/Level:** **5th** year / **10th** Semester
	Prerequisites: CB516 & CB415	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the basic concepts of special topics in construction management.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K5) Recognize methodologies of solving engineering problems, data collection and interpretation • K7) know business and management principles relevant to engineering.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I2) Think in a creative and innovative way in problem solving and design. • I4) Assess the characteristics and performance of components, systems and processes. • I9) Incorporate economic, societal, environmental dimensions and risk management in design. • I12) Solve construction engineering problems.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P8) Apply safe systems at work and observe the appropriate steps to manage risks. • P9) Demonstrate basic organizational and project management skills. • P16) Use appropriate computer-based support tools and software packages for problem-solving and analysis of results.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G3) Communicate effectively. • G4) Demonstrate efficient IT capabilities.

	• G7) Search for information and engage in life-long self learning discipline.
4- Course Content	Week No.1: Introduction to project phases and life cycle: Week No.2: Main project processes: initiation; planning; execution; control; and closure. Week No.3: Project administration and documentation. Week No. 4: Safety and health in construction Week No. 5-6: Construction productivity Week No.7: 7th week evaluation , methods of productivity improvement Week No. 8-11: Risk management: Risk planning; identification; qualitative analysis; response planning, quantitative analysis, simulation and contingencies, risk monitoring and control. Week No.12: 12th week evaluation Week No. 13: Introduction to value engineering and value engineering process. Week No. 14: Procurement and supply chain management. Week No. 15: Sustainable construction; Strategic management concepts Week No.16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets • Projects / Presentations
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets • Presentations Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Case study/Report**
b- Assessment Schedule:	**Assessment — Week — Points** **7th week assessment — (30 points)** • 3 Assignments — (2, 4, and 6) — (6 points) • 3 Quizzes (best 2) — (2, 4, and 6) — (4 points) • Written exam — 7 — (20 points) **12th week assessment — (20 points)** • 2 Assignments — (9 and 11) — (2 points) • 2 Quizzes — (9 and 11) — (3 points) • Written exam — 12 — (15 points) **Semester work assessment — (10 points)** • Attendance — 1 to 15 — (3 points)

	• Case Study/Report	14	(7 points)
	Final exam		**(40 points)**
	• Final written exam	16	(40 points)
c- Weighing of Assessment:	7th week Assessment		30 %
	12th work Assessment		20 %
	Semester work assessment	3 % + 7% =	10 %
	Final Exam		40 %
	Total		**100%**

8- List of References:

a- Course Notes	Lecturing slides may be provided
b- Required Books (Textbooks)	CONSTRUCTION PROJECT MANAGEMENT: AN INTEGRATED APPROACH- FEWINGS, PETER- ROUTLEDGE
c- Recommended Books	A Guide to the Project Management Body of Knowledge by PMBOK Publisher: Project Management Institute, 2004. Construction Project Administration by Fisk, R. Publisher: 2003 Managing Risk: In Construction Projects by Smith, N., Merna, T., and Jobling, P Publisher: Blackwell Publishing, UK, 2006 Construction Management by Halpin, D. W., Publisher: John Wiley and Sons, 2005 Sustainable Construction: Green Building Design and Delivery by Kibert, C., Publisher: Wiley, 2005 Project Management for Construction by LEVY S.M. Publisher: McGraw Hill Inc., N.Y., USA, 2002
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Prof. Dr. Hany Abd El shakour

Course Coordinator:
Dr. Ahmed Abdelmoty Elhakeem

Head of Department:
Dr. Adel Mahmoud Belal.

Assessment Tools	Course ILOs													
	Knowledge and Understanding (K)		Intellectual Skills (I)					Practical and Professional Skills (P)			General and Transferable Skills (G)			
	5	7	1	2	4	9	12	8	9	16	1	3	4	7
Written Tests/quizzes	x	x		x	x				x					
Reports	x		x	x		x	x	x	x	x	x	x	x	x
Assignments	x		x	x	x	x	x		x				x	

Learning Strategy	Course ILOs													
	Knowledge and Understanding (K)		Intellectual Skills (I)					Practical and Professional Skills (P)			General and Transferable Skills (G)			
	5	7	1	2	4	9	12	8	9	16	1	3	4	7
Lectures	x	x	x		x	x	x	x	x					
Self-Learning				x										x
Projects						x				x	x	x	x	
Problem Solving session				x			x							
Computer session			x							x			x	
Seminar and Discussion session		x							x					

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 221	Course Title: **Construction Engineering Drawing** Prerequisites: ME151 Eng. Drwg.	**Academic Year/Level:** 2nd year / 3rd Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 4	

2- Course Aim	The aim of this course to introduce the student with the knowledge of construction engineering drawings.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K10) Technical language and report writing.
b- Intellectual Skills	**N/A**
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P17) Prepare technical drafts and finished drawings both manually and using CAD.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G9) Refer to relevant literatures.

4- Course Content	Week No. 1: Construction industry: Various methods of brick bonds Week No. 2: Construction industry: Various methods of brick arches Week No. 3: Stepped retaining walls Week No. 4: Plain concrete retaining walls Week No. 5: Earth work (Canals) Week No. 6: Earth work (Roads) Week No. 7: Stairs Week No. 8: Residential and Commercial buildings Week No. 9: Residential and Commercial buildings (Cont.) Week No. 10: Steel drawings and construction steel truss (Angles) Week No. 11: Steel truss (Hollow section) Week No. 12: Column Base Week No. 13: Transportation systems (Timber bridge) Week No. 14: Transportation systems (Reinforced concrete bridge) Week No. 15: Transportation systems (Steel bridge) Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Schedule:	Assessment 1 7th Week Assessment Assessment 2 12th Week Assessment Assessment 3 Semester Work Assessment Assessment 4 Final Exam
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Oral Examination 0 % Practical Examination 0 % Semester Work Assessment 10 % Total 100%

8- List of References:	
a- Course Notes	N/A
b- Required Books (Textbooks)	• Construction Engineering Drawings by S.Ibrahim, Publisher: Arab Academy for Science, Technology and Maritime Transport, Alexandria, Egypt, Latest Edition. 2005
c- Recommended Books	• Standard Handbook for Civil Engineers by Merritt, F.S. Publisher: McGraw Hill Book Co., New York, 1983. • Civil Engineering Drawings by Abd El-Rehim, M., and Mostafa, M.R. Publisher: Dar El-Rateb El-Jamiah, Beirut, Lebanon, 1984.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Prof. Dr. Anas Mohamed El-Molla

Dr. Abd El-Hameed Mohamed El-Tahhan

Course Coordinator:

Dr. Abd El-Hameed El-Tahaan

Head of Department:

Dr. Adel Mahmoud Belal

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 322	Course Title: **Building Construction** Prerequisites:CB221 const. drwg.	**Academic Year/Level:** 3rd year / 6th Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 4	

2- Course Aim	The aim of this course is at introducing the student to the knowledge for components of building construction.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. • K7) Business and management principles relevant to engineering. • K14) Principles of construction and building engineering sciences as applied to civil engineering principles.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I4) Assess and evaluate the characteristics and performance of components, systems and processes. • I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. • I14) Determine levels, types and systems of building foundations. Determine levels, types and systems of building foundations based on geotechnical techniques and codes of practice. • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P8) Apply safe systems at work and observe the appropriate steps to manage risks. • P9) Demonstrate basic organizational and project management skills. • P14) Use laboratory and field equipment competently and safely.

d- General and transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G3) Communicate effectively. • G7) Search for information and engage in life-long self-learning discipline.
4- Course Content	Week No. 1: Architectural drawings: Week No. 2: Building opening: Week No. 3: Stairs: Week No. 4: Insulation: Week No. 5: Services: Week No. 6-7: Finishing materials (1,2): Week No. 8: Superstructures: Week No. 9-10: Site works (1,2): Week No. 11: Shallow Foundations: Week No. 12: Deep foundations: Week No. 13: Reinforced concrete elements: Week No. 14: Slabs systems: Week No. 15: Health and safety in construction Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Schedule:	Assessment 1 7th Week Assessment Assessment 2 12th Week Assessment Assessment 3 Semester Work Assessment Assessment 4 Final Exam
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Oral Examination 0 % Practical Examination 0 %

	Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	N/A
b- Required Books (Textbooks)	• Construction Technology (Volumes 1-4) by Chudley, Roy, Publisher: Longman Group Ltd., Essex, England, U.K. , Latest Edition. 2011 • Building Design and Construction Handbook by Merritt, F.S., and Ricketts, J.T. Publisher: McGraw-Hill, Inc., New York, Latest Edition. • Practical Manual of Load Development by Colley, B.C. Publisher: McGraw-Hill, Inc. New York, Latest Edition. • The Construction of Buildings by Barry, R. Publisher: BSP Professional Books, London, U.K. • Construction Methods and Planning by Illingworth, J.R. Publisher: E and FN SPON, London, Latest Edition.
c- Recommended Books	• Construction Technology (Volumes 1-4) by Chudley, Roy, Publisher: Longman Group Ltd., Essex, England, U.K. , Latest Edition. • Building Design and Construction Handbook by Merritt, F.S., and Ricketts, J.T. Publisher: McGraw-Hill, Inc., New York, Latest Edition. • Practical Manual of Load Development by Colley, B.C. Publisher: McGraw-Hill, Inc. New York, Latest Edition. • The Construction of Buildings by Barry, R. Publisher: BSP Professional Books, London, U.K. • Construction Methods and Planning by Illingworth, J.R. Publisher: E and FN SPON, London, Latest Edition.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Prof. Dr. Amr Gera

Dr. khaled el daghar

Course Coordinator:

Dr. Abd El-Hameed El-Tahaan

Head of Department:

Dr. Adel Mahmoud Belal

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 523	Course Title: **Methods and Equipment for construction I**	**Academic Year/Level:** **5th** year / **9th** Semester
	Prerequisites: CB322 Build. Drwg.	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The aim of this course is at introducing the student to the knowledge of construction engineering in the area of building construction
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K5) Methodologies of solving engineering problems, data collection and interpretation • K6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. • K8) Current engineering technologies as related to disciplines. • K12 Contemporary engineering topics.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. • I4) Assess and evaluate the characteristics and performance of components, systems and processes. • I5) Investigate the failure of components, systems, and processes. • I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. • I12) Identify and solve construction engineering problems. •

c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P3) Create and/or re-design a process, component or system, and carry out specialized engineering designs.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G7) Search for information and engage in life-long self-learning discipline.

4- Course Content	Week No. 1: Architectural drawings: Week No. 2: Building opening: Week No. 3: Stairs: Week No. 4: Insulation: Week No. 5: Services: Week No. 6-7: Finishing materials (1,2): Week No. 8: Superstructures: Week No. 9-10: Site works (1,2): Week No. 11: Shallow Foundations: Week No. 12: Deep foundations: Week No. 13: Reinforced concrete elements: Week No. 14: Slabs systems: Week No. 15: Health and safety in construction Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents

7- Student Assessment:

a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Schedule:	Assessment 1 7th Week Assessment Assessment 2 12th Week Assessment Assessment 3 Semester Work Assessment Assessment 4 Final Exam
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 %

	Oral Examination	0 %
	Practical Examination	0 %
	Semester Work Assessment	10 %
	Total	100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	• Construction Methods and Management by Nunnally, S.W., Publisher: Prentice Hall, New Jersey, Latest Edition.
c- Recommended Books	• Principles and Practices of Commercial Construction by Cameron K. Andres, Ronald C. Smith Publisher: ISBN, Latest Edition. • Construction Methods and Planning by Illingworth, J.R., Publisher: Spon Press, UK, ISBN, Latest Edition.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. karim el-Dash

Course Coordinator:

Dr. Abd El-Hameed El-Tahaan

Head of Department:

Dr. Adel Mahmoud Belal

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 524	Course Title: **Methods and Equipment for Construction II**	**Academic Year/Level:** **5th** year / **10th** Semester
	Prerequisites: CB523 meth. I	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The aim of this course is at introducing the student to the knowledge of construction engineering in the area of heavy construction.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K3) Characteristics of engineering materials related to the discipline. • K8) Current engineering technologies as related to disciplines. • K13) The essential construction processes and the technologies and techniques used in the construction and building engineering field. • K17) Projects management, including planning, finance, bidding, contract procedures, cost estimators and quality systems.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I4) Assess and evaluate the characteristics and performance of components, systems and processes. • I7) Select and appraise appropriate ICT tools to a variety of engineering problems. • I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. • I12) Identify and solve construction engineering problems.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P9) Demonstrate basic organizational and project management skills. • P13) Prepare and undertake individual construction engineering projects.

	• P20) Schedule work to meet multiple deadlines in complex activities.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G7) Search for information and engage in life-long self-learning discipline. • G9) Refer to relevant literatures.
4- Course Content	Week No. 1: Earth moving basis. Week No. 2: Hydraulic excavators (1). Week No. 3: Hydraulic excavators (2). Week No. 4: Draglines and clamshells (1). Week No. 5: Draglines and clamshells (2). Week No. 6: Estimating equipment performance. Week No. 7: Dozer. Week No. 8: Loaders, buckets. Week No. 9: Trucks and Wagons (1). Week No. 10: Trucks and Wagons (2). Week No. 11: Piles and pile-driving equipment. Week No. 12: Scrapers. Week No. 13: Belt-Conveyor systems. Week No. 14: The production of crushed stone aggregate. Week No. 15: Health and safety. Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Schedule:	Assessment 1 7th Week Assessment Assessment 2 12th Week Assessment Assessment 3 Semester Work Assessment Assessment 4 Final Exam
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 %

	Final Exam	40 %
	Oral Examination	0 %
	Practical Examination	0 %
	Semester Work Assessment	10 %
	Total	100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	• Managing Construction Equipment by S.W. Nunnally Publisher: Prentice Hall, ISBN, Latest Edition.
c- Recommended Books	• Construction Equipment Management by Schaufelberger.J, Publisher: Prentice Hall, ISBN, Latest Edition. • Construction Equipment Guide by Day D.A., Benjamin N.B.H. Publisher: Wiley-Interscience, ISBN, Latest Edition.
d- Periodicals, Web Sites, …, etc.	N/A

Course Instructor:

Prof. Dr. Hossam Hosni

Course Coordinator:

Dr. Abd El-Hameed El-Tahaan

Head of Department:

Dr. Adel Mahmoud Belal

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 525	Course Title: **Special Topics in Construction Engineering**	**Academic Year/Level:** **5th** year / **10th** Semester
	Prerequisites: CB523 Meth.I	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The aim of this course is at introducing the student to the knowledge of construction engineering in the area of building construction, bridge construction, and tunnel construction.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K12) Contemporary engineering topics. • K13) The essential construction processes and the technologies and techniques used in the construction and building engineering field.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. • I4) Assess and evaluate the characteristics and performance of components, systems and processes.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P3) Create and/or re-design a process, component or system, and carry out specialized engineering designs.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** G7) Search for information and engage in life-long self-learning discipline.

4- Course Content	Week No. 1-2: Shoring and reshoring operations. Week No. 3-5: Design and construction of advanced formwork systems Week No. 6-7: Advanced systems in building construction Week No. 8: Precast concrete technology Week No. 9-11: Bridge construction systems Week No. 12-13: Tunnel construction Week No. 14: Blasting rock Week No. 15: Health and Safety Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents

7- Student Assessment:

a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Schedule:	Assessment 1 7th Week Assessment Assessment 2 12th Week Assessment Assessment 3 Semester Work Assessment Assessment 4 Final Exam
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Oral Examination 0 % Practical Examination 0 % Semester Work Assessment 10 % Total 100%

8- List of References:

a- Course Notes	N/A

b- Required Books (Textbooks)	• Construction Planning, Equipment, and Methods by Peurifoy, R.L., Ledbetter, W.B., and Schexnayder, G.J. Publisher: McGraw Hill Co., New York, Latest Edition.
c- Recommended Books	• Modern Construction and Ground Engineering Equipment and Methods by Harris, F. Publisher: Longman Group Co., U.K., Latest Edition. • Construction Methods and Management by Nunnaly, S.W. Publisher: Prentice Hall, New Jersey, Latest Edition. • Construction Planning, Equipment, and Methods by Peurifoy, R.L., Ledbetter, W.B., and Schexnayder, G.J., Publisher: McGraw Hill Co., New York, Latest Edition. • Formwork for Concrete Structures by Peurifoy, R.L., and Oberlender, G.D. Publisher: McGraw Hill Co., New York, Latest Edition. • Construction Methods and Planning by Illingworth, J.R., Publisher: E and FN SPON, London, Latest Edition.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Prof. Dr. Hossam Hosni

Course Coordinator:

Dr. Abd El-Hameed El-Tahaan

Head of Department:

Dr. Adel Mahmoud Belal

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 431	Course Title: **Technical Installations in Buildings** Prerequisites: CB322 Build. Const.	**Academic Year/Level:** 4th year / 8th Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 4 **Practical** 2	

2- Course Aim	The course aims at understanding of the physical requirements of buildings, the different technical installations in buildings, and the equipment required for building control systems.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K6) Know the quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. • K12) Know the contemporary engineering topics. • K13) Know the essential construction processes and the technologies and techniques used in the construction and building engineering field.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information. • I7) Select and appraise appropriate system to a variety of engineering problems. • I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services (. • P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs. • P10) Apply quality assurance procedures and follow codes and standards. • P12)

	• P17) Prepare technical drafts and finished drawings both manually and using CAD.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G2) Work in stressful environment and within constraints. • G3) Communicate effectively. • G8) Acquire entrepreneurial skills.
4- Course Content	Week No.1: Human comfort and health requirements. Week No.2: Human comfort and health requirements. Continued Week No.3: Thermodynamics Principles. Week No.4: Active HVAC systems – Heating systems Week No.5: Active HVAC systems – Cooling systems. Week No.6: Thermal insulation in buildings Week No.7: Water proofing and moisture problems in buildings. Week No.8: Lighting systems. Week No.9: Vertical circulation. Week No.10: Execution of electrical systems in buildings. Week No.11: Plumbing systems (1,2). Week No.12: Plumbing systems (1,2). Continued Week No.13: Fire protection systems. Week No.14: Architectural acoustics in buildings (1,2). Week No.15: Architectural acoustics in buildings (1,2). Continued Week No.16: Final Exam
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents.
7- Student Assessment:	
a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Reports**
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)**

	• Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	N/A
b- Required Books (Textbooks)	Building Control Systems by Bradshaw V. Publisher: John Wiley, New York, Latest Edition.
c- Recommended Books	Building design and Construction Hand Book by MERRITT F. S., RICKETTS J.T., Publisher: McGraw Hill, Inc, New York, Latest Edition.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Prof. Dr. Mahmoud Abd El-Hameed Mostafa
Prof. Dr. Ashraf kotb

Course Coordinator:
Dr. Ola El Monayeri

Head of Department:
Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs														
	Knowledge and Understanding (K)			Intellectual Skills (I)				Practical and Professional Skills (P)				General and transferable Skills (G)			
	K 6	K 12	K 13	I 3	I 6	I 7	I 8	P 2	P 6	P 10	P 17	G 1	G 2	G3	G 8
Written Tests	√	√	√	√	√		√								
Reports	√		√			√	√								
Oral Test															
Other															

Learning Strategy	Course ILOs														
	Knowledge and Understanding (K)			Intellectual Skills (I)				Practical and Professional Skills (P)				General and Transferable Skills (G)			
	K 6	K 12	K 13	I 3	I 6	I 7	I 8	P 2	P 6	P 10	P 17	G 1	G 2	G3	G 8
Lectures	√	√	√	√	√	√	√	√		√			√		
Tutorials	√				√		√		√	√	√		√		
Reports and Sheets			√		√		√			√		√	√	√	√
Other															

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 532	Course Title: **Environmental and Sanitary Engineering** Prerequisites: CB382 water resc.	**Academic Year/Level:** 5th year / 9th Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the main sources of pollution, understanding the water quality management and wastewater treatment and disposal systems.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the CB discipline • K5) Methodologies of solving engineering problems, data collection and interpretation • K12) Contemporary engineering topics.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information. • I12) Identify and solve construction engineering problems • I13) Solve environmental and socioeconomic problems • I16)
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyse and interpret results. • P6) Use a wide range of analytical tools,

	techniques, equipment, and software packages pertaining to the discipline and develop required computer programs. • P17) Prepare technical drafts and finished drawings both manually and using CAD.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Effectively within multidisciplinary team. • G2) Work in stressful environment and within constraints. • G3) Communicate effectively. • G8) Acquire entrepreneurial skills.
4- Course Content	Week No.1: Environmental systems and sustainable development. Week No.2: Pollution: sources, effects and control (1,2). Week No.3: Pollution: sources, effects and control (1,2). Continued Week No.4: Water quality management Week No.5: Ground water and wells classifications. Week No.6: Surface water collection, treatment and distribution (1,2). Week No.7: Surface water collection, treatment and distribution (1,2). Continued Week No.8: Wastewater properties and biochemical cycle. Week No.9: Sewerage systems classification and design (1,2). Week No.10: Sewerage systems classification and design (1,2). Continued Week No.11: Preliminary wastewater treatment Week No.12: Primary wastewater treatment Week No.13: Biological wastewater treatment Week No.14: Wastewater and sludge disposal (1,2). Week No.15: Wastewater and sludge disposal (1,2). Continued Week No.16:Final Exam
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Reports**
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)**

	• Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	Course hand-out
b- Required Books (Textbooks)	Introduction to Environmental Engineering by M.L. Davis and Cornwell Publisher: PWS Publishers, Boston, Latest Edition.
c- Recommended Books	Wastewater Engineering, Collection and Pumping of Waste water by Metcalf and Eddy, Inc., Publisher: McGraw-Hill Co., New York, Latest Edition.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Dr. Ola El Monayeri

Course Coordinator:
Dr. Ola El Monayeri

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs												
	Knowledge and Understanding (K)			Intellectual Skills (I)			Practical and Professional Skills (P)			General and Transferable Skills (G)			
	K 1	K 5	K 12	I 6	I 12	I 13	P 5	P 6	P 17	G 1	G 2	G3	G 8
Written Tests	√	√	√	√	√	√					√		
Reports							√	√	√	√		√	√
Oral Test	√	√	√								√	√	
Other													

Learning Strategy	Course ILOs												
	Knowledge and Understanding (K)			Intellectual Skills (I)			Practical and Professional Skills (P)			General and Transferable Skills (G)			
	K 1	K 5	K 12	I 6	I 12	I 13	P 5	P 6	P 17	G 1	G 2	G3	G 8
Lectures	√	√	√	√	√	√	√	√	√	√			
Tutorials		√		√	√					√	√	√	
Reports and Sheets		√		√	√					√			√
Other													

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 533	Course Title: **Environmental Control and Energy in Buildings** Prerequisites: CB431 Tech. inst.	**Academic Year/Level:** 5th year / 10th Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the means of energy conservation in buildings, the impact of climate and environment on buildings, and the impact of buildings on microclimate and environment, the different methods of passive heating and cooling.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the CB discipline • K3) Characteristics of engineering materials involved in CB the building and construction and civil engineering projects. • K8) Current CB engineering technologies as related to disciplines. • K11) Professional ethics and impacts of engineering solutions on society and environment. • K12) Contemporary engineering topics.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. • I13) Solve environmental and socioeconomic problems • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects

c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. • P10) Apply quality assurance procedures and follow codes and standards • P11) Exchange knowledge and skills with engineering community and industry.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Effectively within multidisciplinary team. • G5) Lead and motivate individuals. • G7) Search for information and engage in life-long self-learning discipline.
4- Course Content	Week No.1: Sustainable development and renewable energy (1,2). Week No.2:Sustainable development and renewable energy (1,2).continued Week No.3: Air quality standard and public health considerations. Week No.4: Thermal dynamics of buildings Week No.5: Heating load calculations. Week No.6: Cooling load calculations (1,2). Week No.7: Cooling load calculations (1,2). Continued Week No.8: Principles of green building design. Week No.9: Solar control. Week No.10: Wind control Week No.11: Passive heating systems (1,2). Week No.12: Passive heating systems (1,2). Continued Week No.13: Passive cooling systems (1,2). Week No.14:Passive cooling systems (1,2).continued Week No.15: Economics for decision working. Week No.16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Reports**

b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%

8- List of References:

a- Course Notes	Course hand-out
b- Required Books (Textbooks)	Building Control Systems by Bradshaw V. Publisher: John Wiley, New York, Latest 3rd Edition. 2006
c- Recommended Books	Building Control Systems by V. Bradshaw, Publisher: John Wiley, New York, Latest Edition. Building design and Construction Hand Book by MERRITT F.S., RICKETTS J.T. Publisher: McGraw Hill, Inc, New York, Latest Edition.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor: Dr.Heba Mosalam **Course Coordinator: Dr. Ola El Monayeri**

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs														
	Knowledge and Understanding (K)					Intellectual Skills (I)			Practical and Professional Skills (P)				General and Transferable Skills (G)		
	K 1	K 3	K 8	K 11	K 12	I 8	I 13	I 16	P 1	P 2	P 8	P 11	G 1	G5	G 7
Written Tests	√	√	√		√				√				√		
Reports			√	√	√					√	√	√		√	√
Oral Test	√			√					√				√		
Other															

Learning Strategy	Course ILOs														
	Knowledge and Understanding (K)					Intellectual Skills (I)			Practical and Professional Skills (P)				General and Transferable Skills (G)		
	K 1	K 3	K 8	K 11	K 12	I 8	I 13	I 16	P 1	P 2	P 10	P 11	G 1	G5	G 7
Lectures	√	√	√	√	√	√	√	√	√	√	√	√	√		
Tutorials	√					√		√	√	√			√		
Reports and Sheets	√					√	√	√	√	√			√	√	√
Other															

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 534	**Course Title:** Special Topics in Environmental Engineering **Prerequisites:** CB532 sanitary	**Academic Year/Level:** 5th year / 10th Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to environmental legislations and regulations, the Environmental Impact Assessment, the noise pollution and control, the landfill design and solid waste management.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. • K10) Technical language and report writing • K11) Professional ethics and impacts of engineering solutions on society and environment • K12) Contemporary engineering topics
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. • I9) Incorporate economic, societal, environmental dimensions and risk management in design. • I10) Analyse results of numerical models and assess their limitations • I13) Solve environmental and socioeconomic problems
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyse and interpret results. • P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline

	and develop required computer programs. • P8) Apply safe systems at work and observe the appropriate steps to manage risks • P10) Apply quality assurance procedures and follow codes and standards
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Effectively within multidisciplinary team • G5) Lead and motivate individuals • G7) Search for information and engage in life-long self-learning discipline • G8) Acquire entrepreneurial skills
4- Course Content	Week No.1: Environmental legislation and regulations. Week No.2: Environmental legislation in Egypt (1,2). Week No.3: Environmental legislation in Egypt (1,2).continued Week No.4: Environmental impact assessment for civil engineering projects Week No.5: Air pollution standard, control and modeling (1,2). Week No.6: Air pollution standard, control and modeling (1,2). Continued Week No.7: Indoor air pollution Week No.8: Noise pollution standard, control and modeling (1,2). Week No.9: Noise pollution standard, control and modeling (1,2). Continued Week No.10: Solid waste management. Week No.11: Landfills design and solid waste recycling (1,2). Week No.12: Landfills design and solid waste recycling (1,2).continued Week No.13: Hazardous and industrial waste management. Week No.14: Water pollution standard, control and modeling (1,2). Week No.15: Water pollution standard, control and modeling (1,2). Continued Week No.16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents. .
7- Student Assessment:	
a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Reports** **4- Presentations**
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points)

	• 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	Course hand-out
b- Required Books (Textbooks)	Introduction to environmental Engineering by M.L. Davis and Cornwell PublisherMCGRAW-HILL, 4th Edition.2008
c- Recommended Books	• Environmental Engineering by H.S. Peavy, D.R. Rowe and G. Tchobanoglous Publisher: Mc Graw-Hill Co., New York, Latest Edition. • Air pollution assessment and control by Schmidtc Publisher: Wiley, Latest Edition. • Ecological issues and environmental impact assessment by Cheremisinoff, Paul N. Publisher: Gulf Publishing Company, Latest Edition.
d- Periodicals, Web Sites, …, etc.	N/A

Course Instructor:
Dr.Ola El monayeri

Course Coordinator:
Dr.Ola El monayeri

Head of Department:
Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs														
	Knowledge and Understanding (K)				Intellectual Skills (I)			Practical and Professional Skills (P)				General and Transferable Skills (G)			
	K 6	K 10	K 11	K 12	I 8	I 10	I 13	P 5	P 6	P 8	P 10	G 1	G5	G 7	G8
Written Tests	√		√	√	√	√		√		√	√				
Reports		√					√		√	√		√		√	√
Oral Test			√				√			√			√		
Other															

Learning Strategy	Course ILOs														
	Knowledge and Understanding (K)				Intellectual Skills (I)			Practical and Professional Skills (P)				General and Transferable Skills (G)			
	K 6	K 10	K 11	K 12	I 8	I 10	I 13	P 5	P 6	P 8	P 10	G 1	G5	G 7	G8
Lectures	√		√	√	√	√	√	√		√	√	√			
Tutorials				√	√	√	√						√		
Reports and Sheets		√	√		√	√	√	√	√	√		√	√	√	√
Other															

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 240	Course Title: **Theory of Structural Analysis**	**Academic Year/Level:** **2nd** Year / **4th** Semester
	Prerequisites:	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The aim of this course is to give the students the basic understanding of structural and stress analyses of structures. Basics of materials strength and its behavior under different loading stages is illustrated in this course
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K14) Principles of construction and building engineering sciences as applied to civil engineering principles
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects.
c- Practical and Professional Skills	• N/A
d- General and Transferable Skills	N/A

4- Course Content	Week No. 1-2: Introduction, Reactions, Loads. Week No. 3-4: Internal forces in beams subjected to concentrated loads. Week No. 5-6: Structural Analysis of beams subjected to distributed loads. Week No. 7: Structural Analysis of inclined members. Week No. 8-9: Structural Analysis of frames and 7th week examination. Week No. 10-11: Structural Analysis of Trusses. Week No. 12: Properties of areas, and 12th week examination Week No. 13: Normal stress distribution. Week No. 14: Shear stress distribution. Week No. 15: Deflection of beams. Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 %

	Final Exam	40 %
	Semester Work Assessment	10 %
	Total	100%
8- List of References:		
a- Course Notes	N/A	
b- Required Books (Textbooks)	Structures (SI Units) by Schodek, Daniel Publisher: Prentice Hall, 6th Edition, 2008.	
c- Recommended Books	• Mechanics of Materials by BEER, F.P. and JOHNSTON, E.R Publisher: McGraw Hill Book Company, New York, 3rd Edition, 2001. • Analysis and Behavior of Structures by ROSSOW, EDWIN C. Publisher: Prentice Hall, New Jersey, USA, 1996. • Structural Analysis by TARTAGLIONE, LOUIS C. Publisher: McGraw Hill, New York, USA, 1991. • Fundamental of Structural Analysis by WEST, HARRY H. Publisher: John Wiley and Sons, Inc., New York, USA, 2nd Edition, 2002.	
d- Periodicals, Web Sites, ..., etc.	N/A	

Course Instructor:

Dr.Omar el Nawawey

Course Coordinator:

Dr. Sameh Mahfouz

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																															
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	14	1	2	3	4	5	6	7	8	9	16	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5
Written Tests	√									√																									
Reports	√									√										√															
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																															
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	14	1	2	3	4	5	6	7	8	9	16	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5
Lectures	√									√										√															
Tutorials	√									√										√															
Reports + Sheets	√									√										√															
Presentations																																			
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 241	Course Title: **Structural Analysis I** Prerequisites: BA141 mechanics I	**Academic Year/Level:** 2nd Year / 3rd Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 4 **Practical** 2	

2- Course Aim	The course aims is to give students the basic understanding of the structural analysis of statically determinate structures.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation • K14) Principles of construction and building engineering sciences as applied to civil engineering principles.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I12) Identify and solve construction engineering problems. • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects.
c- Practical and Professional Skills	• P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G3) Communicate effectively.

4- Course Content	Week No.1: Introduction to structural analysis, scope, the definition of a structure, its forms, supports and loads. Week No.2: Basic concepts of structural analysis. Study the stability and determinacy of structures. Equilibrium, Free-body diagram, Reaction forces, Worked examples Week No.3: Internal Forces, sign convection, Relationships between load, shear and bending moment. Methods of calculation of internal forces, Worked examples(1and2). Week No.4: Internal Forces, sign convection, Relationships between load, shear and bending moment. Methods of calculation of internal forces, Worked examples(1and2). continue Week No.5: Internal forces in simple beams subjected to concentrated and uniformly distributed loads, Worked examples. Week No.6: Internal forces in simple beams subjected to non-uniform distributed loads. Worked examples. Week No.7: Internal forces in compound beams Principle of superposition. Worked examples and 7th week examination. Week No.8: Internal forces in inclined beams. Worked examples. Week No.9: Internal forces in simple, three-hinged, closed, multi-storey and multi-bay frames. Worked examples (1and2). Week No.10: Internal forces in simple, three-hinged, closed, multi-storey and multi-bay frames. Worked examples (1and2) continue Week No.11: Internal forces in arches. Worked examples (1). Week No.12: Forces in arches. Worked examples and 12th week examination (2). Week No.13: Member forces in statically determinate planar trusses. Worked examples (1and2). Week No.14: Member forces in statically determinate planar trusses. Worked examples (1and2). continue Week No.15: Influence lines and its use to calculate the maximum response functions in statically determinate beams and trusses. Worked examples. Week No.16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Engineering Requirements and design Considerations in School Buildings and its Leading Passages are as indicated in Appendix A.
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.

b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	STRUCTURAL ANALYSIS-SI ED.-(HIBBELER)CB241-HIBBELER, RUSSELL C-PEARSON EDUCATION-8th edt. 2012
c- Recommended Books	• Mechanics of Materials by BEER, F.P. and JOHNSTON, E.R Publisher: McGraw Hill Book Company, New York, 3rd Edition, 2001. • Analysis and Behavior of Structures by ROSSOW, EDWIN C. Publisher: Prentice Hall, New Jersey, USA, 1996. • Structural Analysis by TARTAGLIONE, LOUIS C. Publisher: McGraw Hill, New York, USA, 1991. • Fundamental of Structural Analysis by WEST, HARRY H. Publisher: John Wiley and Sons, Inc., New York, USA, 2nd Edition, 2002.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Dr.Gehan
Dr.mohamed saafan
Prof. Dr. Mahmoud Ghorab

Program Manager:
Dr. Sameh Mahfouz

Head of Department
Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																															
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	14	1	2	3	4	5	6	7	8	12	16	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5
Written Tests	√				√					√									√		√														
Reports	√				√					√									√	√													√		
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																															
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	14	1	2	3	4	5	6	7	8	12	16	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5
Lectures	√				√					√									√		√														
Tutorial	√				√					√									√	√													√		
Reports and Sheets																																			
Presentations																																			
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 242	Course Title: **Strength of Materials** Prerequisites: CB241 &CB 251	**Academic Year/Level:** **2nd** year / **4th** Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 4 **Practical** 2	

2- Course Aim	The course aims to give students the basic understanding of stress analysis of structural elements. It also covers the subjects of calculation of rotations and deflections of such elements and the stability of columns.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation • K14) Principles of construction and building engineering sciences as applied to civil engineering principles; • K15) Properties, behavior and fabrication of construction materials. • K16) Principles of design specific to construction and building.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I5) Investigate the failure of components, systems, and processes. • I12) Identify and solve construction engineering problems. • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects.
c- Practical and Professional Skills	• P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.

d- General and Transferable Skills	• G3) Communicate effectively.
4- Course Content	Week No.1: Properties of Areas. Week No.2: Properties of Areas. continue Week No.3: Normal stresses - Axial stresses. Week No.4: Normal stresses - Axial stresses. continue Week No.5: Normal stresses - Bending stresses. Week No.6: Normal stresses - Bending stresses. continue Week No.7: Normal stresses - Thermal stresses and 7th week examination. Week No.8: Direct shear stresses. Week No.9: Shear stresses. Week No.10: Torsional stresses. Week No.11: Principal stresses and strains. Week No.12: Principal stresses and strains (2) and 12th week examination. Week No.13: Elastic deflection of beams – Double integration. Week No.14: Elastic deflection of beams – Conjugate beam. Week No.15: Buckling of columns. Week No.16: Final Exam
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points)

	2. Assessment 2 12th Week Assessment (20 points) • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	N/A
b- Required Books (Textbooks)	• Mechanics of Materials by BEER, F. and JOHNSTON, E.R., Publisher: McGraw-Hill, New York, USA, 5th Edition, 2009.
c- Recommended Books	• Mechanics of Engineering Materials by BENHAM, P. and CRAWFORD,Z.R. Publisher: Longman Group, 2nd Edition,1996. • Mechanics of Materials by POPOV, E.P. Publisher: Prentice-Hall Englewood cliffsdue to different condition loading,1991. • Mechanics of Materials by R.C. HIBBELER , Publisher: McMillan, New York, 6th Edition, 2013. • Strength of Materials by R.S.KHURMI, Publisher: S.Chand and Company, NewDelhi, 21st , 2008. • Mechanics of Materials by GERE and TIMOSHENKO, Publisher: PWS-KENT Publisher, 8th , 2013.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor: Dr. Tarek Mohmed Ameen
Dr.Sameh Mahfouz Youssef

Course Coordinator:
Dr. Sameh Mahfouz

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	14	15	16	1	2	3	4	5	6	7	8	12	16	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5
Written Tests	√				√			√	√	√					√				√	√	√														
Reports	√				√			√	√	√					√				√	√													√		
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	14	15	16	1	2	3	4	5	6	7	8	12	16	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5
Lectures	√				√			√	√	√					√				√	√	√														
Tutorial	√				√			√	√	√					√				√	√													√		
Reports and Sheets	√				√			√	√	√					√				√	√															
Presentations																																			
Seminar and Discussion session																																			
Other																																			

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 343	Course Title: **Structural Analysis II** Prerequisites:CB242 strength of matr.	**Academic Year/Level:** 3rd year / 5th Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims is to teach students the methods of the structural analysis of different statically indeterminate structural forms.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K5) Methodologies of solving engineering problems, data collection and interpretation • K14) Principles of construction and building engineering sciences as applied to civil engineering principles. • K18) The different analytical and computer methods that can be applied to the various areas of construction and building engineering.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I12) Identify and solve civil engineering problems. • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P7) Apply numerical modeling methods to engineering problems. • P16) Use appropriate computer-based support tools and software packages for problem-solving and analysis of results.

d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G3) Communicate effectively. .
4- Course Content	Week No.1: Introduction to statically indeterminate structures. Methods of structural analysis of statically indeterminate structures. Week No.2: Method of consistent deformations (1, 2), Worked examples. Week No.3: Method of consistent deformations (1, 2), Worked examples. continue Week No.4: Method of three- moment equation for continuous beams, Worked examples. Week No.5: Virtual work method for the analysis of statically indeterminate structures, Worked examples (1, 2). Week No.6: Virtual work method for the analysis of statically indeterminate structures, Worked examples (1, 2) continue Week No.7: 7th week examination. Week No.8: Slope-deflection method, Worked examples. Week No.9: Slope-deflection method, Worked examples. continue Week No.10: Moment Distribution method, Worked examples. Week No.11: Stiffness method, Worked examples and 12th week examination. Week No.12: Stiffness method, Worked examples and 12th week examination. Continue Week No.13: Computer validation (1, 2). Week No.14: Computer validation (1, 2). continue Week No.15; Computer validation (1, 2). continue Week No.16: Final Exam. Week
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets <u>Academic Support:</u> An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points)

	2. Assessment 2 12th Week Assessment (20 points) • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	N/A
b- Required Books (Textbooks)	• STRUCTURAL ANALYSIS-SI ED.-(ASLAM)CB343- KASSIMALI, ASLAM -CENGAGE LEARNING -4th edt. 2011
c- Recommended Books	• Fundamental of Structural Analysis by SPENCER W.J. Publisher: W.J.Spencer, Macmillan Education LTD, USA, 1991. • Theory of Structures by RAMAMRUTHAN S. Publisher: Dh anpat Rai and Sons, 1993. • Analysis and Behavior of Structures by ROSSOW EDWIN C. Publisher: Prentice Hall, New Jersey, USA, 1996. • Structural Analysis by TARTAGLIONE LOUIS C. Publisher: McGraw-Hill Inc.,New York, USA, 1991.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Dr. Tarek Amin
Dr.Sameh mAhfouz
Dr.Ismail Kamal

Course Coordinator:
Dr. Sameh Mahfouz

Head of Department:
Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	14	18	1	2	3	4	5	6	7	8	12	16	1	2	3	4	5	6	7	8	9	16	1	2	3	4	5
Written Tests					√				√	√	√								√	√	√						√								
Reports									√											√										√			√		
Oral Test									√																										
Other																																			

Learning Strategy	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	14	18	1	2	3	4	5	6	7	8	12	16	1	2	3	4	5	6	7	8	9	16	1	2	3	4	5
Lectures					√				√	√	√								√	√	√						√								
Tutorials									√	√										√										√			√		
Reports and Sheets									√	√										√										√					
Presentations																																			
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 444	Course Title: **Design of Metallic Structures**	**Academic Year/Level:** 4th year / 8th semester
	Prerequisites: CB 343 str.II	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 4 **Practical** 2	

2- Course Aim	The course covers the subjects of planning, bracing of metal structures and the design of its elements and their connections. The course deals with also the subject of the construction of metal structures in addition to the safety precautions, durability and sustainability.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K3) Characteristics of engineering materials related to the discipline. • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. • K8) Current engineering technologies as related to disciplines. • K15) Properties, behavior and fabrication of construction materials. • K16) Principles of design specific to construction and building.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I0) Select appropriate solutions for engineering problems based on analytical thinking. • I2) Think in a creative and innovative way in problem solving and design. • I12) Identify and solve construction engineering problems.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. • P3) Create and/or re-design a process, component or system, and carry out specialized engineering designs. • P10) Apply quality assurance procedures and follow codes and standards • P17) Prepare technical drafts and finished drawings both manually and using CAD.

d- Transferable and General Skills	• G3) Communicate effectively.
4- Course Content	Week No.1: Introduction to metallic structures. Week No.2: Planning and bracing of steel structures, Applications. Week No.3: Design of steel tension members, Worked examples. Week No.4: Design of axially loaded compression steel members, Worked examples (1,2). Week No.5: Design of axially loaded compression steel members, Worked examples (1,2). Continue Week No.6: Design of steel beams and its supports, Worked examples. Week No.7: Design of steel beam-columns, Worked examples (1,2) and 7th week examination. Week No.8: Design of steel beam-columns, Worked examples (1,2). continue Week No.9: Design of bolted steel connections, Worked examples. Week No.10: Design of welded steel connections, Worked examples. Week No.11: Design of special steel connections, Worked examples. Week No.12: Design of steel frames and 12th week examination. Week No.13: Design of steel bridges (1,2). Week No.14: Design of steel bridges (1,2). continue Week No.15: Construction of steel structures.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets • Field visits
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)**

	• Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	• Behavior, Analysis and design of Structural Steel Elements by MACHALY, EL-SAYED BAHAA Publisher: Vol. 1, Cairo university, Egypt, Seventh Edition, 2010. • Behavior, Analysis and design of Steelwork Connections by MACHALY, EL-SAYED BAHAA Publisher: Vol. 3, Cairo university, Egypt, Seventh Edition, 2010. Egyptian Code of Practice for Steel Constructions and Bridges, Code No. 205-2001, 2010.
c- Recommended Books	• Behavior, Analysis and design of Structural Steel Elements by MACHALY, EL-SAYED BAHAA Publisher: Vol. 1, Cairo university, Egypt, Seventh Edition, 2010. • Behavior, Analysis and design of Steelwork Connections by MACHALY, EL-SAYED BAHAA Publisher: Vol. 3, Cairo university, Egypt, Seventh Edition, 2010. • Egyptian Code of Practice for Steel Constructions and Bridges, Code No. 205-2001, 2010.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Prof. Dr. Adel Helmy Salem
and Dr. Abdelrahman desokey

Course Coordinator:
Dr. Sameh Mahfouz

Head of Department:
Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	15	16	0	2	3	4	5	6	7	12	15	16	1	2	3	4	5	6	7	8	10	17	1	2	3	4	5
Written Tests			√	√						√	√	√						√															√		
Reports			√	√		√		√	√	√	√											√	√						√	√					
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																		
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	15	16	0	2	3	4	5	6	7	12	15	16	1	2	3	4	5	6	7	8	10	17	1	2	3	4	5
Lectures			√	√		√		√	√	√	√	√						√															√		
Tutorial			√	√		√				√		√										√	√						√	√					
Reports and Sheets			√	√		√				√												√	√						√	√					
Field trip						√		√														√													
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 545	Course Title: **Structural Dynamics** Prerequisites:CB343 str. analysis II	**Academic Year/Level:** **5th** year / **10th** Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course introduces the students to the basic concepts of structural vibrations and its applications in building structures..
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. • K14) Principles of construction and building engineering sciences as applied to civil engineering principles;
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I12) Identify and solve construction engineering problems.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P16) Use appropriate computer-based support tools and software packages for problem-solving and analysis of results.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team.

4- Course Content	Week No.1: Introduction to Structural Dynamics. Week No.2: Equations of motion, Problem statement. Week No.3: Solution methods for the calculation of the dynamic response of structure. Week No.4: Undamped free vibration of single-degree of freedom systems. Week No.5: Damping of structures. Week No.6: Damped free vibration of single degree of freedom systems. Week No.7: Response of harmonic and periodic excitations and 7th week examination. Week No.8: Inelastic systems. Week No.9: Earthquake response of structures. Week No.10: Earthquake Engineering and Cause of earthquakes. Week No.11: Design criteria of seismic resistant structures. Week No.12: Codes of practice for the design of earthquake resistant structures and 12th week examination. Week No.13: Dynamic analysis of tall buildings. Week No.14: Seismic response of tall buildings. Week No.15: Response spectra. Week No.16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points)

	• Group report (5 points) **4. Assessment 4 Final Exam** **(40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	N/A
b- Required Books (Textbooks)	• Dynamics of Structures by CHOPRA, ANIL K., Publisher: Theory and Applications to Earthquake Engineering, Prentice-Hall, Englewood Cliffs, USA., 4th Edition, 2012.
c- Recommended Books	• Structural Dynamics: Theory and Computation by PAZ, M Publisher: Van Nastrand Reinhold Company, New York, 5th Edition, 2004. • Probabilistic Theory of Structural Dynamics by LIN, Y Publisher: McGraw-Hill Inc., 1976.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr.Sameh Mahfouz Youssef

Course Coordinator:

Dr. Sameh Mahfouz

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																															
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	14	1	2	3	4	5	6	7	8	9	12	1	2	3	4	5	6	7	8	9	16	1	2	3	4	5
Written Tests	√					√				√																									
Reports	√									√										√										√	√				
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																															
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	14	1	2	3	4	5	6	7	8	9	12	1	2	3	4	5	6	7	8	9	16	1	2	3	4	5
Lectures	√					√																													
Tutorials	√					√														√										√	√				
Reports and Sheets	√					√														√										√					
Presentations																																			
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 546	Course Title: **Special Topics in Steel and Composite Structures**	**Academic Year/Level:** 5th year / 10th semester
	Prerequisites: CB444 design of metallic Str.	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course concerns with some topics of design, which was not covered in the previous design courses.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K3) Characteristics of engineering materials related to the discipline. • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. • K15) Properties, behavior and fabrication of construction materials. • K16) Principles of design specific to construction and building.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I5) Investigate the failure of components, systems, and processes. • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P10) Apply quality assurance procedures and follow codes and standards. • P14) Use laboratory and field equipment competently and safely. • P16) Use appropriate computer-based support tools and software packages for problem-solving and analysis of results. • P17) Prepare technical drafts and finished drawings both manually and using CAD.

d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G3) Communicate effectively.
4- Course Content	Week No.1: Design of composite steel-concrete structural elements (composite beams, composite columns and composite beam-columns). Week No.2: Design of composite steel-concrete structural elements (composite beams, composite columns and composite beam-columns). continue Week No.3: Design of composite steel-concrete structural elements (composite beams, composite columns and composite beam-columns). continue Week No.4: Design of composite steel-concrete structural elements (composite beams, composite columns and composite beam-columns). continue Week No.5: Design of composite steel-concrete structural elements (composite beams, composite columns and composite beam-columns). continue Week No.6: Design and construction of Steel Bridges Week No.7: Design and construction of Steel Bridges and 7th week examination. continue Week No.8: Design and construction of Steel Bridges. continue Week No.9: Design and construction of Steel Bridges. continue Week No.10: Design and construction of Steel Bridges. continue Week No.11:Design and construction of Structural Elements made of cold-formed steel sections. Week No.12: Design and construction of Structural Elements made of cold-formed steel sections. Week No.13: Design and construction of Structural Elements made of cold-formed steel sections. Week No.14: Design and construction of Structural Elements made of cold-formed steel sections. Week No.15: Design and construction of Structural Elements made of cold-formed steel sections. continue
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets

6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	N/A
b- Required Books (Textbooks)	Egyptian code of practice for steel constriction and bridges code No. 205-2001, 2012.
c- Recommended Books	Composite structures of Steel and Concrete by JOHNSON, R.P Publisher: Volume 1: beams, slabs, columns and frames for buildings, Blackwell Scientific Publications, London, 3rd Edition, 2004.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor: **Course Cordinator:**

Dr. Adel Salim

Dr. Sameh Mahfouz

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	15	16	1	2	3	4	5	6	7	8	9	16	8	9	10	11	12	13	14	15	16	17	1	2	3	4	5
Written Tests			√	√						√					√																				
Reports			√	√		√			√	√					√					√			√				√		√	√			√		
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																		
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	15	16	1	2	3	4	5	6	7	8	9	16	8	9	10	11	12	13	14	15	16	17	1	2	3	4	5
Lectures			√	√		√			√						√																				
Tutorials			√	√					√	√					√					√			√				√		√	√			√		
Reports and Sheets			√	√					√	√					√					√			√				√		√	√					
Presentations																																			
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code:	Course Title:	**Academic Year/Level:**
CB 251	**Testing of Materials**	2nd year / 3rd semester
	Prerequisites: None	
Specialization: **Construction and Building Engineering**	**No. of Instructional Units:** **Lecture** 2 **Practical** 1 **Lab** 1	

2- Course Aim	This course aims to provide an introduction to the students to architecture, performance and properties of different engineering materials and the relation between the structure of Engineering materials and their properties. The course also aims to enable the students to have a good understanding and hand-on experience with the usage and testing of engineering materials.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K3) Characteristics of engineering materials related to the discipline. • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K5) Methodologies of solving engineering problems, data collection and interpretation • K6) Quality assurance systems, codes of practice and standards health and safety requirements and environmental issues. • K8) Current engineering technologies as related to disciplines. • K15) Properties, behavior and fabrication of construction materials.

b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I2) Think in a creative and innovative way in problem solving and design. • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. • I5) Investigate the failure of components, systems, and processes. • I12) Identify and solve construction engineering problems.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems . • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services . • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results . • P14) Use laboratory and field equipment competently and safely . • P15) Observe record and analyze data in laboratory as well as in the field.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G3) Communicate effectively. • G9) Refer to relevant literatures.
4- Course Content	Week No. 1: Introduction Week No. 2: Atomic Bonding Week No. 3-4: The Architecture of Solids Week No. 5: Testing Machines and Laboratory measuring devices Week No. 6: Mechanical Properties of Engineering Materials – Tension test Week No. 7: Mechanical Properties of Engineering Materials – Compression test Week No. 8: Mechanical Properties of Engineering Materials – Bending test Week No. 9: Mechanical Properties of Engineering Materials – Shear test Week No. 10: Mechanical Properties of Engineering Materials – Torsion test Week No. 11: Mechanical Properties of Engineering Materials – Hardness test and Impact Week No. 12: Dislocation and Strengthening Mechanisms Week No. 13: Fracture

	Week No. 14: Fatigue Week No. 15: Creep Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Laboratory experimental work
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets • Laboratories Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%

8- List of References:	Mechanics of Engineering Materials by BENHAM,P. and CRAWFORD,Z.R., Publisher: Longman Group, 1981. The Science and Technology of Civil Engineering Materials by J. F. Young, S. Mindess, R. J. Gray and A. Bentur, Publisher: Prentice Hall, Upper Saddle River, NJ USA, 1998. Materials for Civil and Construction Engineers by M.S. Mamlouk, J. P. Zaniewski, Publisher: Pearson Education, Inc., Pearson Prentice Hall, Upper Saddle River, NJ USA, 2006. Mechanics of Materials by BEER, F. and JOHNSTON, E.R. Publisher: McGraw-Hill, New York, USA, 1986.
a- Course Notes	Lectures` notes
b- Required Books (Textbooks)	Materials Science and Engineering: An Introduction by W. D. Callister Jr. Publisher: John Wiley andSons, Inc, Canada, 2011
c- Recommended Books	Mechanics of Materials by POPOR,E.P. Publisher: Prentice-Hall Englewood cliffs, 2nd Edition, 1991.
d- Periodicals, Web Sites, …, etc.	N/A

Course Instructor:

Dr. Mohamed Mohsen El Attar

Dr.Sanaa El desokey

course co ordinator:

Dr. Ebtisam Abd El Aziz Yehia

Head of department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	15	1	2	3	4	5	6	7	8	9	12	1	2	3	4	5	6	7	8	14	15	1	2	3	4	9
Written Tests	√		√	√	√			√		√		√			√					√	√														
Reports	√		√	√	√	√		√		√	√		√		√					√	√	√			√				√	√	√		√		√
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																		
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	15	1	2	3	4	5	6	7	8	9	12	1	2	3	4	5	6	7	8	14	15	1	2	3	4	9
Lectures	√		√	√	√			√		√			√		√						√	√													
Tutorials and Lab			√			√		√				√			√					√	√				√				√	√	√		√		
Reports and sheets			√			√		√			√	√	√							√	√				√					√	√				√
Presentations																																			
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code:	Course Title:	**Academic Year/Level:**
CB 350	**Building Materials and Testing**	**3rd** year / **5th** Semester
	Prerequisites:	
Specialization: **Construction and Building Engineering**	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	This course aims to provide an introduction to the students to components, design and performance of different construction materials. The course also aims to enable the students to have a good understanding and hands-on experience with the usage and testing of engineering materials.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K3) Characteristics of engineering materials related to the discipline . • K4) Principles of design including elements design, process and/or a system related to specific disciplines . • K5) Methodologies of solving engineering problems, data collection and interpretation • K14) Principles of construction and building engineering sciences as applied to civil engineering principles ; • K15) Properties, behavior and fabrication of construction materials.

b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I4) Assess and evaluate the characteristics and performance of components, systems and processes. • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources . • I12) Identify and solve construction engineering problems.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services . • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results . • P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs . • P10) Apply quality assurance procedures and follow codes and standards . • P14) Use laboratory and field equipment competently and safely . • P15) Observe record and analyze data in laboratory as well as in the field.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G3) Communicate effectively . • G6) Effectively manage tasks, time, and resources . • G9) Refer to relevant literatures.
4- Course Content	Week No. 1: Introduction to elastic load-deformation behavior of materials. Week No. 2: Stress-strain relations of building materials. Week No. 3-4: Aggregates physical properties (1,2). Week No. 5: Cement and its types and properties Week No. 6: Properties of cement paste Week No. 7: Portland Cement Concrete: Basic Ingredients, fresh concrete properties. Week No. 8-9: Proportioning, properties and strength of concrete mixtures (1,2). Week No. 10: Durability of Portland cement concrete and chemical admixtures Week No. 11: Properties of Reinforcing Steel

	Week No. 12: Masonry Week No. 13: Properties of wood and timber Week No. 14: Glass and Plastics Week No. 15: Insulating Materials
5- Teaching and Learning Methods	• Lectures • Tutorials • Laboratory experimental work
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets • Laboratories Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual
b- Assessment Schedule:	**1. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	N/A

b- Required Books (Textbooks)	• Civil Engineering Materials by Shan Somayaji Publisher: Pearson, 2nd Edition, 2001.
c- Recommended Books	• Properties of Concrete by A.M. Neville Publisher: Longman Scientific and Technical, England, 5th Edition,2012. . • Construction Materials: Their Nature and Behavior by J.M. Illston Publisher: Printice Hall, 5th Edition, 2012.
d- Periodicals, Web Sites, …, etc.	N/A

Course Instructor:

Dr. Maged Abd El-Ghaffar Mousa
Dr.sanaa el desokey

Course co ordinator:

Dr. Ebtisam Abd El Aziz Yehia

Head of department :

Dr.Adel Mahmoud Belal

Assessment Tools	Course ILOs																															
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	14	15	1	2	3	4	5	6	7	8	9	12	1	2	3	4	5	6	7	10	14	15	1	2	3	6	9
Written Tests			√	√	√					√		√								√								√							
Reports			√						√	√			√	√						√		√			√	√		√	√	√			√	√	√
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																		
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	14	15	1	2	3	4	5	6	7	8	9	12	1	2	3	4	5	6	7	10	14	15	1	2	3	6	9
Lectures			√	√	√				√	√		√	√							√		√						√							√
Tutorial			√		√					√		√		√						√		√			√	√		√	√	√			√	√	√
Reports and Sheets			√		√							√		√						√		√			√	√		√	√	√				√	√
Presentations																																			
Seminar and Discussion session																																			
Other																																			

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code:	Course Title:	**Academic Year/Level:**
CB 351	**Reinforced Concrete and Metallic Structures (Arch)**	**3rd** year / **5th** Semester
	Prerequisites:	
Specialization: **Construction and Building Engineering**	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The aim of this course is to introduce the students to the design of the reinforced concrete and metallic structures in order to make them able to choose the suitable and convenient main systems of structures and to imagine the size of the different structural elements. Introduce the students to the design of the reinforced concrete and metallic structures in order to make them able to choose the suitable and convenient main systems of structures and to imagine the size of the different structural elements. To meet the requirements of the undergraduate students so they may be applied to many types of reinforced Concrete and metallic structures.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline . • K3) Characteristics of engineering materials related to the discipline . • K4) Principles of design including elements design, process and/or a system related to specific disciplines . • K14) Principles of construction and building engineering sciences as applied to civil engineering principles ; • K15) Properties, behavior and fabrication of construction materials .

	• K16) Principles of design specific to construction and building.

b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources . • I4) Assess and evaluate the characteristics and performance of components, systems and processes . • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information . • I12) Identify and solve construction engineering problems . • I18) Suggest solutions and designs on a conceptual level and in detail that consider sustainability and other issues of importance.
c- Practical and Professional Skills	• **Through professional and practical skills, students will be able to:** • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services . • P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs . • P17) Prepare technical drafts and finished drawings both manually and using CAD.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team . • G3) Communicate effectively . • G6) effectively manage tasks, time, and resources.
4- Course Content	Week No. 1: Planning and selection of R.C. structural systems. Week No. 2: Planning and selection of steel structural systems. Week No. 3: Analysis and design of R.C sections. Week No. 4: Design of R.C. one-way slabs. Week No. 5: Design of R.C. two- way slabs. Week No. 6: Design of R.C. beams. Week No. 7: Design of R.C. columns. Week No. 8: General arrangement and bracing of steel structures. Week No. 9: Design of steel beams. Week No. 10: Design of steel tension members. Week No. 11: Design of steel compression members. Week No. 12: Design of steel columns and supports. Week No. 13: Steel bolted connections. Week No. 14: Steel welded connections. Week No. 15: Selection of construction material and main systems of structures. Week No. 16: Final Exam
5- Teaching and Learning Methods	• Lectures • Tutorials

6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual
b- Assessment Schedule:	**1.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **2. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **3. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **4. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	• Steel Profile Tables • Egyptian Code of Practice for R.C Structures, Latest Edition. • Egyptian Code of Practice "Steel Constructions and Bridges" No 185/Latest Edition.
b- Required Books (Textbooks)	• Design of Reinforced concrete and metallic Structures by Khalifa, A. Publisher: Arab Academy for Science, Technology and Maritime Transport, 2001.

c- Recommended Books	• Reinforced Concrete Design by W.H.Mosley, R. Hulse, J.H. Bungey Publisher: Macmillan, 1986. • Egyptian Code of Practice for R.C Structures, 2007. • Egyptian Code of Practice "Steel Constructions and Bridges" No (205-2001). • Design of R.C by J. C.Mc cormac Publisher: Harpor Collins, 9th Edition, 2013. • Steel Design for Engineers and Architects by Fanella, D.A., R., Knobloch, B. and Mazumder, A. Publisher: Van Nostrand Reinhold Publisher, 2nd Edition, 1992.
d- Periodicals, Web Sites, …, etc.	N/A

Course Instructor:

Dr. Hesham Mohamed Fawzy

course co ordinator:

Dr. Ebtisam Abd El Aziz Yehia

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	14	15	16	1	2	3	4	5	6	7	8	12	18	1	2	3	4	5	6	7	8	9	17	1	2	3	4	6
Written Tests	√		√	√				√	√	√		√		√		√			√																
Reports			√						√	√			√	√					√	√		√				√				√	√		√		√
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	14	15	16	1	2	3	4	5	6	7	8	12	18	1	2	3	4	5	6	7	8	9	17	1	2	3	4	6
Lectures	√		√	√				√	√	√		√	√	√																					
Tutorials	√			√					√				√			√			√	√		√				√				√			√		√
Reports and Sheets	√			√					√				√			√			√	√		√				√				√	√				
Presentations																																			
Seminar and Discussion session																																			
Other																																			

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB352	Course Title: **Construction Materials**	**Academic Year/Level:** 3rd year / 6th Semester
	Prerequisites: CB251 Testing of mat.	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 1 **Lab** 1	

2- Course Aim	The aim of the course is to familiarize the students with different construction materials and their specifications.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K3) Characteristics of engineering materials related to the discipline. • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K15) Properties, behavior and fabrication of construction materials.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design . • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. • I4) Assess and evaluate the characteristics and performance of components, systems and processes. • I12) Identify and solve construction engineering problems.

c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. • P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs. • P14) Use laboratory and field equipment competently and safely. • P15) Observe record and analyze data in laboratory as well as in the field.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G3) Communicate effectively. • G9) Refer to relevant literatures.
4- Course Content	Week No. 1: Terminology and basic geology of construction materials, Specifications and codes – Economy factor. Week No. 2: Engineering properties: Strength and deformation characteristics Week No. 3: Non-mechanical properties: Weight - Volume relationship, Sieve Analysis, Selection of materials for sustainable constructions. Week No. 4-5:Aggregates in Construction (1,2). Week No. 6: Hydraulic Cements. Week No. 7: Properties of Cement Paste, Quiz. Week No. 8: Portland cement concrete: Basic ingredients, basic constituent. Week No. 9: Proportioning of concrete Mixtures. Week No. 10: Concrete Strength and behavior. Week No. 11: Concrete Durability. Week No. 12: Admixtures in Concrete. Week No. 13: Masonry. Week No. 14: Wood in Construction Week No. 15: Asphalt concrete: proportions, Mix procedures, Engineering properties, Quiz. Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets • Laboratories

6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets • Laboratories Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1 -Written Examinations to assess The Intended Learning Outcomes. 2 -Class Activities (Reports, Discussions, ------) to assess The Intellectual
b- Assessment Schedule:	**5. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **6. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **7. Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **8. Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	Properties of Concrete by M.Neville Publisher: longman and Technical, England, 3rd Edition, 1996. Concrete: Structure, properties, and Materials by P.K.Mehta and P.J.Monterio Publisher: Prentice-Hall,Englewood Cliffs,USA, 2nd Edition, 1994. The Science and Technology of Civil Engineering Materials by P.K.Mehta and P.J.Monterio Publisher: Prentice-Hall,Englewood Cliffs,USA, 2nd Edition, 1994. The Science and Technology of Civil Engineering Materials by J. F. Young, S. Mindess, R. J. Gray and A. Bentur Publisher: Prentice Hall,

	Upper Saddle River, NJ USA, 1998. Civil Engineering Materials by Shan Somayaji Publisher: prentic-Hall,Englewood Cliffs, USA,1995. Construction Materials their nature and behavior by J.M.Illston Publisher: E.andFN Spon,1994.
a- Course Notes	Lectures` notes
b- Required Books (Textbooks)	Materials for Civil and Construction Engineers by M.S. Mamlouk, J. P. Zaniewski Publisher: Pearson Education, Inc., Pearson Prentice Hall, Upper Saddle River, NJ USA, 3rd Edition, 2014.
c- Recommended Books	• Materials for civil and Highway Engineers by Derucher,K.N.,Korfiatis, G.P.,and Ezeldin,A.S. Publisher: Prentice-Hall, Englwood Cliffs, N.J.,USA, 3rd Edition ,1994. • Properties of Concrete by M.Neville Publisher: longman and Technical, England, 5th Edition, 2012. • Concrete: Structure, properties, and Materials by P.K.Mehta and P.J.Monterio Publisher: Prentice-Hall,Englewood Cliffs,USA, 2nd Edition, 1993. • The Science and Technology of Civil Engineering Materials by J. F. Young, Publisher: Prentice Hall, Upper Saddle River, NJ USA, 1998. • Civil Engineering Materials by Shan Somayaji Publisher: prentic-Hall,Englewood Cliffs, USA, 2nd Edition, 2001.
d- Periodicals, Web Sites, …, etc.	N/A

Course Instructor:

Prof. Dr. El-Sayed Abd El-Raouf Abd El-Kader
DR.Mohamed Mohsen El atar

course coordinator:

Dr. Ebtisam Abd El Aziz Yehia

Head of department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																															
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	15	1	2	3	4	5	6	7	8	9	12	1	2	3	4	5	6	7	8	14	15	1	2	3	4	9
Written Tests	√		√	√						√		√		√						√															
Reports			√							√			√	√						√		√			√	√			√	√			√		√
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																		
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	15	1	2	3	4	5	6	7	8	9	12	1	2	3	4	5	6	7	8	14	15	1	2	3	4	9
Lectures	√		√	√						√		√		√						√															
Tutorial and Lab			√	√						√				√						√		√			√	√			√	√					
Reports and Sheets			√	√						√			√	√						√		√				√				√	√		√		√
Presentations																																			
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB354	Course Title: **Design of Reinforced Concrete Structures I**	**Academic Year/Level:** 3rd year /6th semester
	Prerequisites: CB343 str. Ana. II	
Specialization: Construction Materials and Reinforced Concrete Structures Courses Group	**No. of Instructional Units:** **Lecture** 2 **Practical** 1	

2- Course Aim	The aim of this course is to describe the behavior of reinforced concrete components and structures, which leads to analysis and design.

3- Intended Learning Outcome

The student knows the concepts and philosophy of design and analysis of reinforced concrete structures.

a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K3) Characteristics of engineering materials related to the discipline. • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K15) Properties, behavior and fabrication of construction materials.

b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I0) Select appropriate solutions for engineering problems based on analytical thinking. • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. • I4) Assess and evaluate the characteristics and performance of components, systems and processes. • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information. • I12) Identify and solve construction engineering problems. • I18) Suggest solutions and designs on a conceptual level and in detail that consider sustainability and other issues of importance.

c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P2) professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. • P3) Create and/or re-design a process, component or system, and carry out specialized engineering designs. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. • P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs. • P16) Use appropriate computer-based support tools and software packages for problem-solving and analysis of results. • P17) Prepare technical drafts and finished drawings both manually and using CAD.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G3) Communicate effectively. • G9) Refer to relevant literatures. • G6) Effectively manage tasks, time, and resources.
4- Course Content	Week No.1 Introduction to material properties. Week No.2 Elastic method: analysis of beams considering flexure. Week No.3 Elastic method: design of beams considering flexure. Week No.4 Limit state design method: analysis of beams considering flexure. Week No.5 Limit state design method: design of beams considering flexure. Week No.6 Limit state design method: design of beams considering flexure (Cont.). Week No.7 Limit state design method: design of beams considering flexure (Cont.) Week No.8 Principle of shear and torsion. Week No.9 Design of beams considering shear and torsion. Week No.10 Development length according to ECP 2000. Week No.11 Deflection. Week No.12 Design of two-way slabs. Week No.13 Design of two-way slabs (1,2). Week No.14 Design of two-way slabs (1,2), Continued. Week No.15 Design of short columns. Week No.16 Final Exam.

5- Teaching and Learning Methods	• Lectures • Tutorials
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	Assignments Quiz Mid-term exams Final exam Attendance and performance
b- Assessment Schedule:	**9. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **10.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **11.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **12.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	N/A

b- Required Books (Textbooks)	• Design of Reinforced Concrete Strutures "Volume 2" by Ghoneim, Mashhour and El-mihilmy, Mahmoud Publisher, 3rd Edition 2012. • Egyptian Code of Practice for Reinforced Concrete Structures, 2007.
c- Recommended Books	• Reinforced Concrete Design by W.H.Moslay, R.Hulse, J.H.Bungey Publisher: MacMillan, 1999. • Design of Reinforced Concrete Strutures "Volume 1" by Ghoneim, Mashhour and El-mihilmy, Mahmoud ,3rd Edition, 2012. • Reinforced Concrete Design by C. Wang and C.G.Salmon Publisher: Harpor Row, Latest Edition. • Design of Reinforced Concrete Structures by J.C.McCarmac Publisher: Harper Collins, 9th Edition,2013 . .
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Dr. Abo zeid
Dr Ebtisam Abd El aziz YEhia

course co-ordinator:
Dr. Ebtisam Abd El Aziz Yehia

Head of Department:
Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																																		
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	15	1	2	3	4	5	6	7	8	12	18	1	2	3	4	5	6	7	8	16	17	1	2	3	6	9
Written Tests	√		√	√						√		√		√																					
Reports	√		√	√								√	√	√		√			√	√		√	√		√	√			√	√	√		√	√	√
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																		
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	15	1	2	3	4	5	6	7	8	12	18	1	2	3	4	5	6	7	8	16	17	1	2	3	6	9
Lectures	√		√	√						√				√					√	√															
Tutorial			√	√						√		√	√	√		√			√	√											√		√		
Project and Sheets			√	√								√	√			√			√	√		√	√		√	√			√	√	√			√	√
Presentations																																			
Seminar and Discussion session																																			
Other																																			

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB455	Course Title: **Design of Reinforced Concrete Structures II**	**Academic Year/Level:** 4th year / 7th semester
	Prerequisites: CB354 Design of Reinforced Concrete Structures I	
Specialization: Construction Materials and Reinforced Concrete Structures Courses Group	**No. of Instructional Units:** **Lecture** 2 **Practical** 1	

2- Course Aim	Familiarize the students with the analysis and design of different structural elements. And Introduce the students to the fundamental elements, which make up the design of different structural elements.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K3) Characteristics of engineering materials related to the discipline. • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K15) Properties, behavior and fabrication of construction materials.

b- Intellectual Skills	**Through knowledge and understanding, students will be able to:** • I0) Select appropriate solutions for engineering problems based on analytical thinking. • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. • I4) Assess and evaluate the characteristics and performance of components, systems and processes. • I12) Identify and solve construction engineering problems. • I18) Suggest solutions and designs on a conceptual level and in detail that consider sustainability and other issues of importance.
c- Practical and Professional Skills	**Through intellectual skills, students will be able to:** • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. • P3) Create and/or re-design a process, component or system, and carry out specialized engineering designs. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. • P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs. • P16) Use appropriate computer-based support tools and software packages for problem-solving and analysis of results. • P17) Prepare technical drafts and finished drawings both manually and using CAD.
d- General and Transferable Skills	**Through professional and practical skills, students will be able to:** • G3) Communicate effectively. • G9) Refer to relevant literatures.

4- Course Content	Week No.1	Sections subjected to combined shear and torsion.
	Week No.2	Design of stairs.
	Week No.3	One-/two-way hollow block slabs (ribbed slabs)
	Week No.4	One-/two-way hollow block slabs (ribbed slabs) (cont.) - Design of paneled beam.
	Week No.5	Design of paneled beam (cont.) - Sections subjected to combined bending and normal force.
	Week No.6	Sections subjected to combined bending and normal force (cont.).
	Week No.7	Sections subjected to combined bending and normal force (cont.) - Design of slender columns.

	Week No.8 Design of slender columns (cont.). Week No.9 Design of frames. Week No.10 Design of frames (cont.) - Design of flat slab. Week No.11 Design of flat slab (cont.). Week No.12 Design of flat slab (cont.) - Design of water tanks. Week No.13 Design of water tanks (cont.). Week No.14 Design of water tanks (cont.). Week No.15 Introduction to design of Pre-stressed structures. Week No.16 Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	Assignments Quiz Mid-term exams Final exam Attendance and performance
b- Assessment Schedule:	**13.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **14.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **15.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **16.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%

8- List of References:	
a- Course Notes	N/A
b- Required Books (Textbooks)	• Design of Reinforced Concrete Structures by Ghoneim, M, and El-Mihilmy, M, Publisher: Volume 1 and 2, 3rd Edition, 2012. • Egyptian Code of Practice for Reinforced Concrete Structures, 2007.
c- Recommended Books	• Reinforced Concrete Design by W.H.Moslay, R.Hulse, J.H.Bungey Publisher: McMillan, 1999. • Reinforced Concrete Design by C.K.Wang and C.G.Salmon Publisher: Harpor Row, 7th Edition 2006. • Design of reinforced Concrete Structures by J.C.Mc Carmac Publisher: Harper Collins, 9th Edition, 2013. • Egyptian code of Practice for Reinforced Concrete Structures 2007.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Dr. Ebtisam Yehia
Dr . Walid Abdallah
Dr.Abo Zeid

course co-ordinator:
Dr. Ebtisam Abd El Aziz Yehia

Head of Department:
Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																															
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	15	1	2	3	4	5	6	7	8	12	18	1	2	3	4	5	6	7	8	16	17	1	2	3	4	9
Written Tests	√		√	√						√		√	√	√					√																
Reports	√		√	√						√		√	√	√					√	√		√	√		√	√			√	√			√		√
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																															
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	12	18	1	2	3	4	5	6	7	8	16	17	1	2	3	4	9
Lectures	√		√	√						√		√	√	√						√		√													
Tutorial	√		√	√								√		√					√	√		√			√	√			√	√					
Project and Sheets																							√						√	√			√		√
Field trip										√																							√		
Seminar and Discussion session																																			
Other																																			

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 556	Course Title: **Concrete Technology**	**Academic Year/Level:** 5th year / 9th semester
	Prerequisites: CB352 Constr. Mat.	
Specialization: Construction Materials and Reinforced Concrete Structures Courses Group	**No. of Instructional Units:** **Lecture** 1 **Practical** 1	

2- Course Aim	The aim of the course is to emphasize the importance of concrete technology in construction.
3- Intended Learning Outcome The students are exposed to progress in concrete technology, advanced concrete mechanics as well as the future demands of concrete.	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K2) Basics of information and communication technology (ICT) • K3) Characteristics of engineering materials related to the discipline. • K14) Principles of construction and building engineering sciences as applied to civil engineering principles; • K15) Properties, behavior and fabrication of construction materials.

b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. • I5) Investigate the failure of components, systems, and processes. • I12) Identify and solve construction engineering problems. • I18) Suggest solutions and designs on a conceptual level and in detail that consider sustainability and other issues of importance
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. • P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs. • P12) Prepare and present technical reports. • P14) Use laboratory and field equipment competently and safely. • P15) Observe record and analyze data in laboratory as well as in the field.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G3) Communicate effectively. • G6) Effectively manage tasks, time, and resources. • G9) Refer to relevant literatures.
4- Course Content	Week No.1 Concrete workability and consistency. Week No.2 Concrete manufacturing. Week No.3 Mixing, transporting and casting of concrete. Week No.4 Properties of hardened concrete. Week No.5 Compacting and curing of concrete. Week No.6 Expansion joints. Week No.7 Concrete admixtures. Week No.8 Concrete durability (1.2.3). Week No.9 Concrete durability (1.2.3).continued Week No.10 Concrete durability (1.2.3).continued Week No.11 Design of concrete mixtures. Week No.12 Evaluation of concrete strength.

	Week No.13 Ready mix concrete. Week No.14 Hot weather concreting. Week No.15 Hot weather concreting. continued Week No.16 Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	Assignments Quiz Mid-term exams Final exam Attendance and performance
b- Assessment Schedule:	**17.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **18.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **19.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **20.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 %

	Total 100%
8- List of References:	
a- Course Notes	N/A
b- Required Books (Textbooks)	• Properties of concrete by M Neville Publisher: longman scientific and technical, England, 4th Edition, 1995.
c- Recommended Books	• Concrete: Structure, properties, and Materials by P.K.Mehta and P.J. Monterio Publisher: 2nd Edition, Prentice-Hall, Englewood Cliffs,USA, 1993. • Manual for concrete practice by American Concrete institute Publisher: Parts 1 5, detroit, USA, 2002. • Concrete by M.Sidney and Y.Francis Publisher: printice-Hall, Inc. Englewood cliffes, N.J.07632. 2nd Edition, 2003.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Dr. Maged Abd elgafar Mosa

course coordinator:
Dr. Ebtisam Abd El Aziz Yehia

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																																		
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	14	15	1	2	3	4	5	6	7	8	12	18	1	2	3	4	5	6	7	12	14	15	1	2	3	6	9
Written Tests	√		√						√	√					√				√	√															
Reports	√	√							√	√		√	√		√				√	√		√			√	√		√	√	√	√		√	√	√
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																		
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	14	15	1	2	3	4	5	6	7	8	12	18	1	2	3	4	5	6	7	12	14	15	1	2	3	6	9
Lectures	√		√						√	√					√				√	√															
Tutorial	√	√	√						√	√		√	√		√				√	√		√			√	√		√	√	√	√		√	√	√
Report and Sheets	√	√	√						√	√		√	√		√				√	√		√			√	√		√	√	√				√	√
Presentations																																			
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB557	Course Title: **Inspection, Maintenance and Repair of structures.**	**Academic Year/Level:** 5th year / 10th Semester
	Prerequisites: CB444 & CB455	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 1 **Practical** 1	

2- Course Aim	The aim of the course is to introduce the subjects of maintenance, inspection, and repair of structures to under graduate students. The course introduces an overview of maintenance, Causes and agents of deterioration, Diagnosis and investigation techniques, Diagnosis and investigation techniques, Foundations repair, concrete defects, Repair of concrete structure, Site visit for a repair project, Other materials investigation and repair.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline . • K2) Basics of information and communication technology (ICT) • K3) Characteristics of engineering materials related to the discipline . • K14) Principles of construction and building engineering sciences as applied to civil engineering principles ; • K15) Properties, behavior and fabrication of construction materials.

b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources . • I5) Investigate the failure of components, systems, and processes . • I18) Suggest solutions and designs on a conceptual level and in detail that consider sustainability and other issues of importance
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. • P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs. • P14) Use laboratory and field equipment competently and safely. • P15) Observe record and analyze data in laboratory as well as in the field.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G3) Communicate effectively . • G6) Effectively manage tasks, time, and resources . • G9) Refer to relevant literatures.
4- Course Content	Week No.1 Overview of maintenance. Week No.2 Overview of maintenance, Continued. Week No.3 Causes and agents of deterioration. Week No.4 Causes and agents of deterioration, continued. Week No.5 Diagnosis and investigation techniques. Week No.6 Diagnosis and investigation techniques, continued. Week No.7 Foundations repair. Week No.8 Foundations repair, continued. Week No.9 Foundations repair, continued. Week No.10 Concrete defects. Week No.11 Repair of concrete structure. Week No.12 Repair of concrete structure, continued. Week No.13 Repair of concrete structure, continued. Week No.14 Site visit for a repair project. Week No.15 Other materials investigation and repair. Week No.16 Final Exam.

5- Teaching and Learning Methods	• Lectures • Tutorials
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	Assignments Quiz Mid-term exams Final exam Attendance and performance
b- Assessment Schedule:	**21.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **22.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **23.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **24.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	N/A

b- Required Books (Textbooks)	• Building Maintenance Technology by L.H.Son, and G.C.S.Yuen Publisher: Macmillan Press, London, 1993.
c- Recommended Books	• Repair and Protection of Concrete Structures by N.P. Mailvaganam Publisher: CRC Press, Florida, USA, 1992.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Hesham Fawzy

course co-ordinator:

Dr. Ebtisam Abd El Aziz Yehia

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	14	15	1	2	3	4	5	6	7	8	9	18	1	2	3	4	5	6	7	8	14	15	1	2	3	6	9
Written Tests	√		√						√	√	√				√																		
Reports	√	√	√						√	√	√		√		√					√		√			√	√			√	√			√	√	√
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																		
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	14	15	1	2	3	4	5	6	7	8	9	18	1	2	3	4	5	6	7	8	14	15	1	2	3	6	9
Lectures	√		√						√	√		√			√																		
Tutorial		√	√						√	√		√	√		√					√		√			√	√			√	√			√		
Reports and Sheets		√	√							√		√	√		√					√		√			√	√			√	√				√	√
Field visit										√																							√		
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 558	Course Title: **Special Topics in Reinforced Concrete Structures.**	**Academic Year/Level:** 5th year /10th Semester
	Prerequisites: CB455 **Design of Reinforced Concrete Structures II**	
Specialization: Construction Materials and Reinforced Concrete Structures Courses Group	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	This course aims to provide an introduction for the students to the design of special structures for transportation as bridges, as well as special structures for workshops in factories or halls in administration buildings or theatres. In addition to the design of special structures for water or grain storage.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K3) Characteristics of engineering materials related to the discipline. • K15) Properties, behavior and fabrication of construction materials.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. • I4) Assess and evaluate the characteristics and performance of components, systems and processes.

	• I12) Identify and solve construction engineering problems. • I18) Suggest solutions and designs on a conceptual level and in detail that consider sustainability and other issues of importance
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P17) Prepare technical drafts and finished drawings both manually and using CAD.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G3) Communicate effectively. • G9) Refer to relevant literatures.
4- Course Content	Week No.1: Design of north light (saw-tooth) structures (1,2). Week No.2: Design of north light (saw-tooth) structures (1,2), continued. Week No.3: Design of shell roof and dome Structures (1,2). Week No.4: Design of shell roof and dome Structures (1,2), continued. Week No.5: Design of arched frame structures. Week No.6: Design of elevated circular tanks (1,2). Week No.7: Design of elevated circular tanks (1,2), continued. Week No.8: Design of ground tanks (1,2). Week No.9: Design of ground tanks (1,2), continued. Week No.10: Design of silos structures (1,2). Week No.11: Design of silos structures (1,2), continued. Week No.12: Design of Pre-stressed Bridges (Working stress method/ Ultimate strength method) (1,2,3). Week No.13: Design of Pre-stressed Bridges (Working stress method/ Ultimate strength method) Week No.14: Design of Pre-stressed Bridges (Working stress method/ Ultimate strength method) (1,2,3), continued. Week No.15: Design of Pre-stressed Bridges (Working stress method/ Ultimate strength method) (1,2,3), continued. Week No.16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets <u>Academic Support:</u> An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents

7- Student Assessment:	
a- Procedures used:	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual Skills.
b- Assessment Schedule:	**25.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **26.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **27.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **28.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	N/A
a- Course Notes	Class Notes
b- Required Books (Textbooks)	• Concrete Structures: Stresses and Deformations by Ghali, R. Favre, and M. Elbadry, Publisher: Taylor and Francis, Inc., 4th Edition, 2012. • Prestressed Concrete: Analysis and Design by A.E. Naaman Publisher: McGraw-Hill, 3rd Edition, 2012. • Reinforced Concrete Design by C.K. Wang and C.G. Salmon Publisher: Wiley, 7th Edition, 2006. • Design of Reinforced Concrete Structures by J.C. Mc Cormac Publisher: Harper Collins, 9th Edition, 2013. • Reinforced Concrete Design by W.H. Mosley, R. Hulse, J.H., Bungey Publisher: McMillan, 1986.
c- Recommended Books	N/A

d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:
Prof.Dr. Mash'hour Ghoniem

course co-ordinator:
Dr. Ebtisam Abd El Aziz Yehia

Head of department:
Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	15	1	2	3	4	5	6	7	8	12	18	1	2	3	4	5	6	7	8	9	17	1	2	3	4	9
Written Tests	√		√							√		√		√					√	√															
Reports	√		√							√			√	√					√	√										√			√		√
Oral Test																																			
Other																																			

Learning Strategy	Course ILOs																																
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	2	3	4	5	6	7	8	9	15	1	2	3	4	5	6	7	8	12	18	1	2	3	4	5	6	7	8	9	17	1	2	3	4	9
Lectures	√		√							√		√		√					√	√															
Lab and Tutorial	√		√							√		√	√	√					√	√										√			√		√
Report and Sheets	√		√							√		√	√	√					√	√										√					√
Presentations																																			
Seminar and Discussion session																																			
Other																																			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB361	Course Title: **Engineering Geology** Prerequisites: None	**Academic Year/Level:** 3rd year /5th Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 1 **Lab** 1	

2- Course Aim	The course aims at introducing the student to the basics and principles of engineering geology, and the physical characteristics of soil through using ;communication technologies and skills, engineering technologies, data collection and interpretation from laboratory and field, and writing technical reports referring to the relevant literature..
3- Intended Learning Outcome	
a- Knowledge and Understanding	• K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K2) Basics of information and communication technology (ICT) • K3) Characteristics of engineering materials related to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation. • K6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. • K8) Current engineering technologies as related to disciplines. • K10) Technical language and report writing • K12) Contemporary engineering topics. • K15) Properties, behavior and fabrication of construction materials. • K14) Principles of construction and building engineering sciences as applied to civil engineering principles;

b- Intellectual Skills	• I4) Assess and evaluate the characteristics and performance of components, systems and processes. • I5) Investigate the failure of components, systems, and processes. • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information. • I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. • I14) Determine levels, types and systems of building foundations. Determine levels, types and systems of building foundations based on geotechnical techniques and codes of practice. • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects. • I18) Suggest solutions and designs on a conceptual level and in detail that consider sustainability and other issues of importance
c- Practical and Professional Skills	• P11) Exchange knowledge and skills with engineering community and industry. • P12) Prepare and present technical reports. • P14) Use laboratory and field equipment competently and safely. • P15) Observe record and analyze data in laboratory as well as in the field.
d- General and Transferable Skills	• G1) Collaborate effectively within multidisciplinary team. • G8) Acquire entrepreneurial skills. • G9) Refer to relevant literatures.

4- Course Content	**Week No. 1**: **Soil in engineering**: General perspective of geotechnical engineering and engineering geology, general approach to solving geotechnical problems **Week No. 2: Earth surface**: Changes in the earth, types and origins of rocks, dimensions and surface relief of the earth and ocean floors, temperature gradient and density inside the earth **Week No. 3**: **Earth structure and age:** Composition of the earth, earthquakes, changes in earth before occurrence, belts, scales of magnitude, waves and their propagation mechanism, continental drift, oceanic ridges, plate tectonics, earth age **Week No. 4: Rocks and soil deposits:** The geological cycle; igneous, sedimentary and metamorphic rocks, sedimentary deposits **Week No. 5: Surface processes:** Rock weathering, clay minerals, flocculation and dispersion, absorbed water; compressibility, shrinkage and expansion **Week No. 6**: **Soil transport:** Water-transported soils, wind-transported soils, glaciers, residual soils **Week No. 7**: Geological structures: dip and strike, unconformity, folds, faults, brittle fracture, normal and reverse faults, fault groups, joints, geological maps **Week No. 8**: **Subsurface exploration:** Scope of exploration program, depth of exploration, spacing of borings, site reconnaissance, subsurface exploration, behavior of adjoining structures **Week No. 9: Subsurface exploration**:

	Geophysical testing, borings, disturbed samples, undisturbed samples, core boring, test pits, field tests, observation wells, boring logs **Week No. 10: Physical properties of soils**: Void ratio, porosity, water content, degree of saturation, specific gravity, volumetric-gravimetric relationships, relative density of granular soils. **Week No. 11**: **Index properties of soils:** Consistency of clays, Atterberg limits: liquid limit, plastic limit, shrinkage limit; activity and sensitivity **Week No. 12: Soil classification:** Classification based on grain size, coefficients of uniformity and curvature, AASHTO classification system, Unified Soil Classification system **Week No. 13: Permeability of soils:** Flow through circular capillary tubes, Darcy's law, constant-head permeability test, falling-head permeability test **Week No. 14: Permeability coefficient:** Field permeability tests, authenticity of k values from laboratory tests, influence of constituents, stratification, horizontal and vertical flow on permeability **Week No. 15**: **Soil capillarity**: Surface tension; pressure; capillary rise in tubes of variable radius, capillary phenomenon in soils, capillary forces; shrinkage and swelling **Week No. 16: Final Exam.**
5- Teaching and Learning Methods	- Lectures - Tutorials - Reports and sheets - Laboratories
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets • Laboratories Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Reports** **4- Presentations**
b- Assessment Schedule:	**29.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **30.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **31.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points)

	32.Assessment 4 Final Exam (40 points) • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	• Geology Applied to Engineering by WEST, Terry R. Publisher: Prentice Hall, New York, 1994. • Engineering Geology by BELL, Fred G. Publisher: Blackwell, 1993 • Geology for Civil Engineers by McLEAN, A. C. and GRIBBLE, C. D. Publisher: George Allen and Irwin, London, 1986. • Engineering Geology: An Environmental Approach by RAHN, Perry H. Publisher: Prentice Hall, 1996. • Fundamentals of Geotechnical Engineering by DAS, Braja M. Publisher: Brooks-Cole, 1999. • Geotechnical Engineering: Soil Mechanics by CERNICA, John N. Publisher: Wiley, New York, 1995.
a- Course Notes	Handout of the presentation slides.
b- Required Books (Textbooks)	Geotechnical Engineering: Principles And Practices, 2nd edition, by Coduto, Donald. Publisher: Pearson Education, Inc., Pearson Prentice Hall, Upper Saddle River, NJ USA, 2011.
c- Recommended Books	Fundamentals of Geotechnical Engineering by DAS, Braja M. Publisher: Brooks-Cole, 1999.
d- Periodicals, Web Sites, ..., etc.	ASCE, Geotechnical Engineering Journal, USGS

Course Instructor:
Dr. Sameh Abu El Soud

Course Coordinator:
Dr. Sameh Abu El Soud

Head of Department:
Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																										
	Knowledge and Understanding (K)										Intellectual Skills (I)								Practical and Professional Skills (P)					General and Transferable Skills (G)			
	1	2	3	5	6	8	10	12	14	15	4	5	6	8	14	16	18		11	12	14	15		1	8	9	
Written Examinations	●		●	●	●	●			●	●	●	●	●		●	●											
Assignments	●		●	●	●	●			●	●	●	●	●	●	●	●											
Reports		●	●		●	●	●	●		●		●		●	●	●	●		●	●	●	●		●		●	
Presentations		●	●			●	●	●		●		●		●	●		●		●	●	●	●		●	●		

Learning Strategy	Course ILOs																										
	Knowledge and Understanding (K)										Intellectual Skills (I)								Practical and Professional Skills (P)					General and Transferable Skills (G)			
	1	2	3	5	6	8	10	12	14	15	4	5	6	8	14	16	18		11	12	14	15		1	8	9	
Lectures	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●										
Tutorials	●			●	●		●		●	●	●	●	●	●	●	●	●				●	●					
Reports and Assignments	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●	●	
Presentations						●	●	●											●	●				●	●		
Laboratories			●							●		●									●	●		●			

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB362	Course Title: **Soil Mechanics**	**Academic Year/Level:** 3rd year /6th semester
	Prerequisites: CB 361 Geology	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2 **Lab** 2	

2- Course Aim	The course aims at introducing the student to the fundamentals of soil mechanics as a basis for the design, analysis and construction of retaining structures and foundations through using ;communication technologies and skills, engineering technologies, data collection and interpretation from laboratory and field, and writing technical reports referring to the relevant literature..
3- Intended Learning Outcome	
a- Knowledge and Understanding	• K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation • K14) Principles of construction and building engineering sciences as applied to civil engineering principles; • K15) Properties, behavior and fabrication of construction materials. • K16) Principles of design specific to construction and building. • K18) The different analytical and computer methods that can be applied to the various areas of construction and building engineering.
b- Intellectual Skills	• I12) Identify and solve construction engineering problems. • I5) Investigate the failure of components, systems, and processes. • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects. • I14) Determine levels, types and systems of building foundations. Determine levels, types and systems of building foundations based on geotechnical

	techniques and codes of practice. • I15) Evaluate and integrate information and processes through individual and group project work.
c- Practical and Professional Skills	• P12) Prepare and present technical reports. • P14) Use laboratory and field equipment competently and safely. • P15) Observe record and analyze data in laboratory as well as in the field. • P17) Prepare technical drafts and finished drawings both manually and using CAD. • P20) Schedule work to meet multiple deadlines in complex activities.
d- General and Transferable Skills	• G1) Collaborate effectively within multidisciplinary team. • G8) Acquire entrepreneurial skills. • G7) Search for information and engage in life-long self learning discipline. • G9) Refer to relevant literatures.

4- Course Content	**Week No. 1-2:Seepage:** Seepage forces, quick condition, elements of flow net theory Flow nets for two-dimensional flow, determination of seepage quantity from flow nets, seepage through earth dams **Week No. 3-4:Stresses in soils:** Total and effective stresses, seepage and effective stress, distribution of pressure from point load, Boussinesq's equations, uniformly loaded circular area Pressure caused by uniformly loaded rectangular area, pressure caused by embankment load, Newmark's influence chart, approximate estimate of vertical stress **Week No. 5: Consolidation and settlement:** Compressibility of soil, one-dimensional consolidation, mechanical analogy model, load-deformation characteristics of soils, one-dimensional consolidation theory **Week No. 6: Consolidation test:** Determination of coefficient of consolidation cv, log-time and root-time methods, one-dimensional consolidation test, secondary compression **Week No. 7: Settlement of soils:** Immediate (elastic) settlement, settlement predictions based on one-dimensional consolidation, settlement during construction, total and differential settlements, tolerable settlements in buildings **Week No. 8: Shear strength of soil:** Mohr's theory of failure, determination of the shear strength of cohesionless and cohesive soils, factors affecting shear strength, in situ evaluation of shear strength **Week No. 9: Stability of slopes:** Infinite slopes, the circular arc analysis, ordinary method of slices, Bishop's simplified method, semi-graphical approximation **Week No. 10:Stability of slopes:** Stability charts, Cousin's approach for simple slopes, sliding on

	inclined plane; liquefaction, seismic effects and drawdown **Week No. 11: Lateral earth pressure:** Active and passive earth pressures, Rankine's theory for level and inclined surfaces, Coulomb's equation **Week No. 12: Lateral earth pressure:** Lateral earth pressure in partially cohesive soils, unsupported cuts in (c-ϕ) soil, effect of surcharge loads, Culmann's method **Week No. 13: Compaction**: Standard and modified Proctor tests, field equipment, performance control, in-place field tests, compacted clays, vibratory compaction **Week No. 14: Bearing capacity:** Bearing failure patterns, Prandtl's theory for ultimate bearing capacity, bearing capacity theory of Terzaghi, Meyerhof and Hansen **Week No. 15: Bearing capacity of shallow foundations:** Effect of water table, bearing capacity based on standard penetration tests; compressible, collapsible and expansive formations **Week No. 16: Final Exam.**
5- Teaching and Learning Methods	- Lectures - Tutorials - Reports and sheets - Laboratories
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets • Laboratories <u>Academic Support:</u> An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**1-Written Examinations** **2- Assignments** **3- Reports** **4- Presentations**.
b- Assessment Schedule:	**33. Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **34. Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points)

	• 12th week exam (15 points) **35.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **36.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7^{th} Week Assessment 30 % 12^{th} Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	Basic Soil Mechanics by WHITLOW Publisher: Longman, 3rd Edition 1995. Soil Mechanics: Principles and Practice by BARNES, G. E., Publisher: McMillan, London, 1995 Soil Mechanics by CRAIG, R. F., Publisher: Chapman and Hall, 5th Edition 1992 Advanced Soil Mechanics by DAS, Braja M. Publisher: Taylor and Francis, Washington, 2nd Ed. 1997 Soil Mechanics Laboratory Manual by DAS, Braja M. Publisher: Engineering Press, 1997 Slope Stability and Stabilization Methods by ABRAMSON, Lee, Sharma and Boyce, Publisher: Wiley, New York, 1996. Solving Problems in Soil Mechanics by Sutton, Publisher: Longman, London, 2^{nd} E. 1993 Design and Construction of Foundations, Egyptian Code for Soil Mechanics, Design and Construction of Foundations, 1st Edition, 10 Volumes, Al-Ahram Press, 2001. Geotechnical Engineering: Soil Mechanics by CERNICA, John N., Publisher: Wiley, New York, 1995. Experimental Soil Mechanics by BARDET, Jean-Pierre Publisher: Prentice Hall, New York, 1997.
a- Course Notes	Handout of the presentation slides.

b- Required Books (Textbooks)	Principles of Geotechnical Engineering by DAS, Braja M., Publisher: CENGAGE LEARNING, 8th 2014. Egyptian Code of Practice for Foundation and Soil Mechanics, Code No. 203/2007
c- Recommended Books	Soil Mechanics by CRAIG, R. F., Publisher: Chapman and Hall, 5th Edition 1992 Advanced Soil Mechanics by DAS, Braja M. Publisher: Taylor and Francis, Washington, 2nd Ed. 1997
d- Periodicals, Web Sites, ..., etc.	ASCE, Geotechnical Engineering Journal.

Course Instructor:

Dr. Sameh Abo elsoud

Dr. Adel Mahmoud Belal

Course Coordinator:

Dr. Sameh Abu El Soud

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																														
	Knowledge and Understanding (K)										Intellectual Skills (I)										Practical and Professional Skills (P)										General and Transferable Skills (G)				
	1	5	14	15	16	18					5	12	14	15	16						12	14	15	17	20						1	7	8	9	
Written Examinations	●	●	●	●	●	●					●	●	●		●																		
Assignments	●	●	●	●	●	●					●	●	●		●																		
Reports				●		●					●		●	●	●						●	●	●		●						●	●		●	
Presentations				●		●					●		●	●							●	●	●	●							●	●	●		

Learning Strategy	Course ILOs																														
	Knowledge and Understanding (K)							Intellectual Skills (I)							Practical and Professional Skills (P)							General and Transferable Skills (G)										
	1	5	14	15	16	18		5	12	14	15	16			12	14	15	17	20			1	7	8	9							
Lectures	●		●	●	●	●		●	●	●		●							●												
Tutorials	●	●	●	●		●		●	●	●	●	●				●	●	●	●				●								
Reports and Assignments	●	●	●	●		●		●	●	●	●	●			●	●	●	●	●			●	●	●	●							
Presentations															●							●	●	●								
Laboratories				●				●								●	●					●										

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB460	Course Title: **Soil Mechanics**	**Academic Year/Level:** 4 rd year /7 th semester
	Prerequisites:	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the fundamentals of soil mechanics as a basis for the design, analysis and construction of retaining structures and foundations through using ;communication technologies and skills, engineering technologies, data collection and interpretation, and writing technical reports referring to the relevant literature and their relation to the architectural design.
3- Intended Learning Outcome	
a- Knowledge and Understanding	• K2) Basics of information and communication technology (ICT) • K3) Characteristics of engineering materials related to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation. • K8) Current engineering technologies as related to disciplines. • K12) Contemporary engineering topics. • K13) The essential construction processes and the technologies and techniques used in the construction and building engineering field. • K14) Principles of construction and building engineering sciences as applied to civil engineering principles. • K16) Principles of design specific to construction and building.

b- Intellectual Skills	• I12) Identify and solve construction engineering problems. • I2) Think in a creative and innovative way in problem solving and design. • I14) Determine levels, types and systems of building foundations. Determine levels, types and systems of building foundations based on geotechnical techniques and codes of practice. • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects.
c- Practical and Professional Skills	• P12) Prepare and present technical reports. • P14) Use laboratory and field equipment competently and safely. • .P15) Observe record and analyze data in laboratory as well as in the field. • P17) Prepare technical drafts and finished drawings both manually and using CAD.
d- General and Transferable Skills	• G1) Collaborate effectively within multidisciplinary team. • G3) Communicate effectively. • G7) Search for information and engage in life-long self learning discipline. • G8) Acquire entrepreneurial skills. • G9) Refer to relevant literatures.

4- Course Content	
	Week No. 1: Soil formation and identification: Coarse-grained and fine-grained soils, various phases (solid, liquid and gaseous) of a soil, volumetric-gravimetric relationships in soils **Week No. 2: Basic soil properties**: Atterberg limits of a cohesive soil, grain size distribution (sieve and hydrometer methods), coefficients of uniformity and concavity, soil description and classification; Compaction, optimum moisture content (OMC) **Week No. 3: Site investigation**: Phases and steps of site investigation, in-situ measurements, soil report; contents and interpretation **Week No. 4: Sampling and laboratory tests:** In—situ sampling techniques and limitations; shear strength tests: shearbox test, shear vane test, pocket penetrometer and pocket shearmeter tests, unconfined compression test **Week No. 5: Seepage and dewatering**: uplift force on structures, changes in pore pressures and effective stresses associated with seepage problems, dewatering techniques, procedures and precautions of dewatering **Week No. 6: Compressibility and consolidation**: Vertical stress increment in soil due to point and rectangular loads, hydrodynamic time lag concept, coefficient of consolidation for fine-grained soils, coefficient of volume compressibility, consolidation

	settlement of low-permeability soils owing to increase of total stress. **Week No. 7: Shear strength and bearing capacity:** Shear strength parameters, cohesive soils and cohesionless soils, bearing capacity of shallow footings, bearing capacity factors **Week No. 8: Shallow foundations:** Types of shallow foundations; uses, advantages and limitations of each type, bearing capacity under shallow foundations, bending moment, one- and two-way shear in isolated footings **Week No. 9: Deep foundations:** Types and usage of piles, methods of pile construction, design of single piles, pile load test **Week No. 10: Soil stabilization**: Concept and needs, methods and techniques of soil stabilization **Week No. 11: Foundations and architectural options:** Relation between type of soil and type of foundation, relation between type of foundation and structural design, relation between structural design and architectural design **Week No. 12: Applications to architectural design:** Relation between soil formations and types of structural system **Week No. 13: Earth slopes:** Stability of slopes in c–soils, safety factor against failure for slopes in various types of soil, factors affecting stability of slopes, means to raise the safety factor against failure for slopes **Week No. 14: Retaining structures:** Types of retaining walls, usage and limitations of each type, stability against various modes of failure, types of sheet-pile walls, methods of sheet pile design, modes of sheet pile failure **Week No. 15: Applications to landscaping:** Relation between geometry of slopes and soil characteristics, aesthetic potentials in earth landscaping **Week No. 16: Final Exam.**
5- Teaching and Learning Methods	- Lectures - Tutorials - Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets <u>Academic Support:</u> An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents .
7- Student Assessment:	

a- Procedures used:	1- **Written Examinations** **2- Assignments** **3- Reports** **4- Presentations**.
b- Assessment Schedule:	**37.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **38.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **39.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **40.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	Geotechnical Engineering: Soil Mechanics by CERNICA, John N., Publisher: Wiley, New York, 1995 Basic Soil Mechanics by WHITLOW Publisher: Longman, 3rd Edition, 1995 Experimental soil mechanics by BARDET, J.-P., Publisher: Prentice Hall, 1997 Geotechnical Engineering: Foundation Design by CERNICA, John N., Publisher: Wiley, 1995 Earth Reinforcement and Soil Structures by JONES, Colin Publisher: Thomas Telford, London, 1996 Slope Stability and Stabilization Methods by ABRAMSON, Lee, Sharma and Boyce, Publisher: Wiley, New York, 1996. Foundation Design and Construction by TOMLINSON, M. J. and Boorman R., Publisher: Longman, London, 6th Ed 1995 Foundation Analysis and Design by BOWLES, J. E., Publisher: McGraw-Hill, New York, 5th Ed. 1996. Design and Construction of Foundations, Egyptian Code for Soil Mechanics, Design and Construction of Foundations, 1st Edition, 10 Volumes, Al-Ahram Press, 2001.

a- Course Notes	Handout of the presentation slides.
b- Required Books (Textbooks)	Soil Mechanics andFoundations by Chengliu , 7th edition Jack P. Ebett, Publisher: Pearson Education, Inc., Pearson Prentice Hall, Upper Saddle River, NJ USA, 2008.
c- Recommended Books	Geotechnical Engineering: Foundation Design by CERNICA, John N., Publisher: Wiley, 1995
d- Periodicals, Web Sites, ..., etc.	ASCE, Geotechnical Engineering Journal.

Course Instructor:

Dr. Adel Mahmoud Belal

Course Coordinator:

Dr. Sameh Abu El Soud

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																											
	Knowledge and Understanding (K)										Intellectual Skills (I)								Practical and Professional Skills (P)					General and Transferable Skills (G)					
		2	3	5	8	12	13	14	16		2	12	14	16					12	14	15	17		1	3	7	8	9	
Written Examinations			●	●	●			●	●		●	●	●	●															
Assignments			●	●	●			●	●		●	●	●	●															
Reports		●	●		●	●	●						●	●					●	●	●			●	●	●		●	
Presentations		●	●		●	●	●						●						●	●	●	●		●		●	●		

Learning Strategy	Course ILOs																											
	Knowledge and Understanding (K)										Intellectual Skills (I)								Practical and Professional Skills (P)					General and Transferable Skills (G)					
	2	3	5	8	12	13	14	16			2	12	14	16					12	14	15	17		1	3	7	8	9	
Lectures	●	●		●	●	●	●	●				●	●	●														
Tutorials			●				●				●	●	●	●						●	●	●				●			
Reports and Assignments		●	●	●	●	●	●				●		●	●					●	●	●	●		●	●	●	●	●	
Presentations				●	●	●													●					●	●	●	●		

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB463	Course Title: **Design and Construction of Earth Structures and Foundations**	**Academic Year/Level:** 4th year /8th semester
	Prerequisites: CB362 & CB354	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at building up the student activities directed for the basic aspects of design, analysis and construction of retaining structures and foundations through using ;communication technologies and skills, engineering technologies, data collection and interpretation, and writing technical reports referring to the relevant literature .
3- Intended Learning Outcome	
a- Knowledge and Understanding	• K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K5) Methodologies of solving engineering problems, data collection and interpretation. • K6) Identify different quality assurance systems, codes of practice and standards • K14) Principles of construction and building engineering sciences as applied to civil engineering principles; • K16) Principles of design specific to construction and building.

b- Intellectual Skills	• I4) Assess and evaluate the characteristics and performance of components, systems and processes. • I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. • I14) Determine levels, types and systems of building foundations. Determine levels, types and systems of building foundations based on geotechnical techniques and codes of practice. • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects. • I7) Select and appraise appropriate ICT tools to a variety of engineering problems. • I17) Analyze and interpret financial information. • I18) Suggest solutions and designs on a conceptual level and in detail that consider sustainability and other issues of importance.
c- Practical and Professional Skills	• P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. • P10) Apply quality assurance procedures and follow codes and standards. • P11) Exchange knowledge and skills with engineering community and industry. • P12) Prepare and present technical reports. • P14) Use laboratory and field equipment competently and safely. • P17) Prepare technical drafts and finished drawings both manually and using CAD. • P18) Prepare quantity surveying reports, cost estimates, and construction schedules. • P15) Observe record and analyze data in laboratory as well as in the field.
d- General and Transferable Skills	• G1) Collaborate effectively within multidisciplinary team. • G2) Work in stressful environment and within constraints. • G3) Communicate effectively. • G8) Acquire entrepreneurial skills. • G9) Refer to relevant literatures.

4- Course Content	**Week No. 1: Shallow foundations:** Types of shallow foundations, application of each type, design requirements, code provisions for allowable stresses and settlements **Week No. 2: Design of isolated footings:** Design of isolated footings, safety factors against stability and structural failure, construction considerations **Week No. 3: Combined footings:** Design of combined footings, the beam on elastic foundation approach, coefficient of subgrade reaction, computer applications **Week No. 4: Strap footings**: Design of footings and strap **Week No. 5: Strap footings:** Safety factors against stability and structural failure **Week No. 6: Mat foundations:** Types and usage of mat foundations, classical design approach, the beam on elastic foundation approach, construction considerations **Week No. 7: Retaining walls and structures:** Types of retaining walls, usage and limitations of each type, reinforced concrete (RC) cantilever retaining walls, overall and structural stability, construction considerations **Week No. 8: Sheet-pile walls:** Types of sheet-pile walls, applications, methods of sheet pile design, modes of sheet pile failure, design of anchored sheet-piles **Week No. 9: Sheet-pile walls:** Design of cantilever sheet-pile walls **Week No. 10: Sheet-pile walls:** Structural details, construction considerations, modes of failures **Week No. 11: Piles:** Types and usage of piles, bored and driven piles, timber, RC and steel piles, methods of pile construction **Week No. 12: Single piles:** Design of single piles, single pile capacity, settlement of single pile **Week No. 13: Pile groups:** Pile group capacity, settlement of pile group, pile group construction **Week No. 14: Pile-load test:** Pile load test, objective, procedure, test result interpretation, pile integrity test **Week No. 15: Pile caps:** Design and construction of pile caps **Week No. 16: Final Exam.**
5- Teaching and Learning Methods	- Lectures - Tutorials - Reports and sheets

6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	1- **Written Examinations** **2- Assignments** **3- Reports** **4- Presentations**
b- Schedule:	**41.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **42.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **43.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **44.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	Foundation Analysis and Design by BOWLES, J. E. Publisher: McGraw-Hill, New York, 5th Ed., 1996. Soil Mechanics: Principles and Practice by BARNES, G. E., Publisher: McMillan, London, 1995. Geotechnical Engineering: Foundation Design by CERNICA, John N., Publisher: Wiley, 1995. Soil Mechanics by CRAIG, R. F., Publisher: Chapman and Hall, 5th Edition

	1992. Piling Engineering by FLEMING, Weltman, Randolph and Elson, Publisher: Blackie, London, 1992. Earth Reinforcement and Soil Structures by JONES, Colin, Publisher: Thomas Telford, London, 1996. Foundation Design and Construction by TOMLINSON, M. J. and Boorman R. Publisher: Longman, London, 6th Ed., 1995 Slope Stability and Stabilization Methods by ABRAMSON, Lee, Sharma and Boyce, Publisher: Wiley, New York, 1996. Design and Construction of Foundations, Egyptian Code for Soil Mechanics, Design and Construction of Foundations, 1st Edition, 10 Volumes, Al-Ahram Press, 2001
a- Course Notes	Handout of the presentation slides.
b- Required Books (Textbooks)	Principles of Foundation Engineering 6th edition, by DAS, Braja M., Publisher: Brooks-Cole, London, 2007.
c- Recommended Books	Foundation Analysis and Design by BOWLES, J. E. Publisher: McGraw-Hill, New York, 5th Ed., 1996.
d- Periodicals, Web Sites, …, etc.	ASCE, Geotechnical Engineering Journal.

Course Instructor:

Prof. Dr. Fath Allah Mohamed El-Nahhas

Course Coordinator:

Dr. Sameh Abu El Soud

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																								
	Knowledge and Understanding (K)					Intellectual Skills (I)							Practical and Professional Skills (P)								General and Transferable Skills (G)				
	4	5	6	14	16	4	7	8	14	16	17	18	2	10	11	12	14	15	17	18	1	2	3	8	9
Written Examinations	●	●	●	●	●	●			●	●	●									●					
Assignments	●	●	●	●	●	●	●	●	●	●	●			●						●					
Reports			●				●	●	●	●		●	●		●	●	●	●		●	●	●	●		●
Presentations							●	●	●			●	●		●	●	●	●	●		●			●	

Learning Strategy	Course ILOs																									
	Knowledge and Understanding (K)						Intellectual Skills (I)							Practical and Professional Skills (P)								General and Transferable Skills (G)					
	4	5	6	14	16		4	7	8	14	16	17	18	2	10	11	12	14	15	17	18	1	2	3	8	9	
Lectures	●		●	●	●		●		●	●	●	●	●														
Tutorials	●	●	●	●			●	●	●	●	●	●	●	●	●			●	●	●	●						
Reports and Assignments	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Presentations																●	●				●	●			●		

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB564	Course Title: **Special Topics in Geotechnical Engineering** Prerequisites:CB463 Foundation.	**Academic Year/Level:** 5th year /10th semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at building up the student activities directed for the advanced practical topics in geotechnical engineering as well as to the fundamentals of geo-environmental engineering. Tthrough using ;communication technologies and skills, engineering technologies, data collection and interpretation, and writing technical reports referring to the relevant literature .
3- Intended Learning Outcome	
a- Knowledge and Understanding	• Comprehend theory and design of the RES(K 4) • Understand the engineering properties and interaction mechanism of this structural element in RES(K 3) • Knowledge of several methodologies of solving engineering problems(K5) • Identify different quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues(K6) • Principles of design specific to construction and building.(K16) • The essential construction processes and the technologies and techniques used in the construction and building engineering field.(K13) • Principles of construction and building engineering sciences as applied to civil engineering principles;(K14) • Properties, behavior and fabrication of construction materials.(K15) • Concepts and theories of mathematics and sciences, appropriate to the discipline.(K1) • Technical language and report writing(K10) • Basics of information and communication technology (ICT).(K2) • Professional ethics and impacts of engineering solutions on society and environment(K11).

b- Intellectual Skills	• Identify and solve construction engineering problems.(I12) • Analyze and interpret financial information.(I17) • Suggest solutions and designs on a conceptual level and in detail that consider sustainability and other issues of importance.(I18) • Determine levels, types and systems of building foundations. Determine levels, types and systems of building foundations based on geotechnical techniques and codes of practice.(I14) • Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects.(I16)
c- Practical and Professional Skills	• Apply quality assurance procedures and follow codes and standards(P 10) • P6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs • P17) Prepare technical drafts and finished drawings both manually and using CAD. • P2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. • P15) Observe record and analyze data in laboratory as well as in the field. • P18) Prepare quantity surveying reports, cost estimates, and construction schedules. • P12) Prepare and present technical reports.
d- General and Transferable Skills	• prepare professional monitoring reports for planned structures(G 1) • prepare due-diligence and appraisal reports for both; internal and external stability analysis. (G8) • Communicate effectively. (G3)

4- Course Content	**Week No. 1: Soil reinforcement:** Reinforced soil properties, elements of a reinforced earth system, design criteria, construction considerations, foundation with soil reinforcement **Week No. 2: Ground modification:** Ground modification concept, need for improvement. Mechanical and chemical techniques of soil stabilization **Week No. 3: Soil improvement:** Vibro-floatation, sand drain, pre-compression. Foundations on problematic subsurface soil conditions, foundation design precautions **Week No. 4: Mat foundations:** Types and usage of mat foundations. Classical design methods. Numerical design method **Week No. 5: State of unsaturated soil**: Suction and potential of soil water, suction regimes and soil-water characteristic curve, material variables **Week No. 6: State of stress in unsaturated soil**: Effective stress, hysterisis in soil-water characteristic curve, representation of stress tensor **Week No. 7: Shear strength of unsaturated soil:** Extended Mohr-Coulomb criterion, shear strength parameters. Capillary cohesion in unsaturated soils, validity of effective stress as a state variable. Effect of suction on lateral earth pressure **Week No. 8: Water flow in unsaturated soils:** Hydraulic conductivity function, steady infiltration and evaporation, measurement of hydraulic conductivity. Suction and hydraulic conductivity models **Week No. 9: Transport of contaminants in the subsurface**: Contaminant release, contaminant transport, fate of contaminants in the subsurface **Week No. 10-11: Waste treatment methods**: Stabilization, solidification, mechanisms, technology, testing, field implementation, design. Case studies. **Week No. 12-13: Land disposal of waste:** Landfill operations, site selection, liner collection systems, cover systems. Contaminant transport through landfill barriers, landfill stability, closure and post-closure care **Week No. 14: Site remediation**: Site and subsurface characterization, methodology, planning. Site characterization, geophysics, boring and sampling,

	monitoring wells. Geographic information system **Week No. 15: Containment:** Passive contaminant control systems. Ground water control technologies, active systems **Week No. 16: Final Exam.**
5- Teaching and Learning Methods	- Lectures - Tutorials - Reports and sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**1. Written Examinations** **2. Assignments** **3. Reports** 4. **Presentations**
b- Schedule:	**45.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **46.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **47.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points)

	48.Assessment 4 Final Exam (40 points) • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	Foundation Design and Construction by TOMLINSON, M. J. and Boorman R., Publisher: Longman, London, 6th Ed 1995. Geotechnical Engineering: Foundation Design by CERNICA, John N. Publisher: Wiley, 1995. Piling Engineering by FLEMING, Weltman, Randolph and Elson, Publisher: Blackie, London, 1992. Hazardous Waste Management by LaGREGA, M. D., Buckingham, P. L., and Evans, J. C Publisher: McGraw-Hill, New York, 1994. Geotechnical Practice for Waste Disposal by DANIEL, D. E. ed., Publisher: Chapman and Hall, New York, NY, 1993. Design, Construction and Monitoring of Sanitary Landfill by BAGCHI, A. Publisher: John Wiley, New York, NY, 1990. Soil Mechanics for Unsaturated Soils by FREDLUND, D.G., and Rahardjo, H. Publisher: John Wiley, New York, NY,1993.
a- Course Notes	Handout of the presentation slides.
b- Required Books (Textbooks)	Foundation Design and Construction by Tomlinson, M., 2nd edition, Publisher Pearson Education, Inc., Pearson Prentice Hall, Upper Saddle River, NJ USA, 2008
c- Recommended Books	Foundation Analysis and Design by BOWLES, J. E. Publisher: McGraw-Hill, New York, 5th Ed., 1996. Foundation Design and Construction by TOMLINSON, M. J. and Boorman R., Publisher: Longman, London, 6th Ed 1995.
d- Periodicals, Web Sites, ..., etc.	ASCE, Geotechnical Engineering Journal.

Course Instructor:

Prof. Dr. Fath Allah Mohamed El-Nahhas

Dr. Adel Mahmoud Belal

Course Coordinator:

Dr. Sameh Abu El Soud

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs																												
	Knowledge and Understanding (K)											Intellectual Skills (I)					Practical and Professional Skills (P)							General and Transferable Skills (G)				
	1	3	4	5	6	10	11	13	14	15	16	12	14	16	17	18	2	6	10	12	15	17	18	1	2	3	8	9
Written Examinations	●	●	●	●	●				●	●	●	●	●	●	●								●					
Assignments	●	●	●	●	●				●	●	●	●	●	●	●				●				●					
Reports		●			●	●	●	●		●			●	●		●	●	●		●	●		●	●	●	●		●
Presentations		●				●	●	●		●			●			●	●	●		●	●	●		●			●	

Learning Strategy	Course ILOs																												
	Knowledge and Understanding (K)											Intellectual Skills (I)					Practical and Professional Skills (P)							General and Transferable Skills (G)				
	1	3	4	5	6	10	11	13	14	15	16	12	14	16	17	18	2	6	10	12	15	17	18	1	2	3	8	9
Lectures	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●												
Tutorials	●		●	●	●	●			●	●		●	●	●	●	●	●	●	●		●	●	●					
Reports and Assignments	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Presentations						●	●	●												●			●	●			●	

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 271	Course Title: **Construction Surveying I**	**Academic Year/Level:** 2nd year / 4th Semester
	Prerequisites: BA124 MathII	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2 **Lab** 2	

2- Course Aim	To familiarize the student with the engineering applications of surveying instruments and methods in the layout of the construction of engineering projects and setting out techniques . Through using ;communication technologies and skills, engineering technologies, data collection and interpretation, and writing technical reports referring to the relevant literature
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I2) Think in a creative and innovative way in problem solving and design. • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information.
c- Professional Skills	**Through professional and practical skills, students will be able to:** • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P18) Prepare quantity surveying reports, cost estimates, and construction schedules.

d- General Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G2) Work in stressful environment and within constraints.

4- Course Content	Week No. 1: General introduction, Basic principles of surveying and plan scales Week No. 2: Measurement of distances and linear surveying techniques Week No. 3: Bearing of surveying lines. Week No. 4: Rectangular Coordinates Calculation Week No. 5: Area calculation of closed traverse Week No. 6: Application of practical surveying problems Week No. 7: Compass traversing, 7th Week exam. Week No. 8: Theodolite Traversing Week No. 9: Profile Leveling , Rise and Fall Method Week No. 10: Profile Leveling, HPC Method Week No. 11: Contouring, contour lines, contour interval, properties, reading , cross sections. Week No. 12: Drawing Contour lines, SURFER software, 12th Week exam. Week No. 13: Volume of earth work, formation levels, calculation based on spot levels, 12th Week exam. Week No. 14: Volume of Longitudinal Earthwork projects Week No. 15: Intersection of Earthwork projects with Contour Maps Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Reports and sheets • Laboratories
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets • Laboratories Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**5. Written Examinations** **6. Assignments** **7. Reports** 8. **Presentations**
b- Schedule:	**49.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **50.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points)

	51.Assessment 3 Semester Work Assessment (10 points) • Attendance (5 points) • Group report (5 points) **52.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	Handout of the presentation slides.
b- Required Books (Textbooks)	• Surveying for Construction by William Irvine, 5th edition, Publisher: McGraw-Hill , London, 2006
c- Recommended Books	• Surveying for Construction by William Irvine , FRICS Publisher: McGraw-Hill , London, Latest Edition. • Surveying, by A. Bannister and S. Raymond Publisher: Pitman, London, Latest Edition. • Elementary Surveying, by Paul R. Wolf and Russell C. Brinker, Publisher: Prentice Hall, Inc. Latest Edition. • Surveying, Fourth Edition by Jack McCormac Publisher: Prentice Hall Inc. Latest Edition.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Tamer Fathi Sorror

Group Co-ordinator:

Dr. Akram Sultan Kotb

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs									
	Knowledge and Understanding (K)		Intellectual Skills (I)			Practical and Professional Skills (P)			General and Transferable Skills (G)	
	1	2	1	2	6	1	5	8	1	2
Written Examinations	●		●	●	●	●				
Assignments	●	●	●	●	●	●				
Reports		●					●	●	●	●
Presentations							●	●	●	

Learning Strategy	Course ILOs									
	Knowledge and Understanding (K)		Intellectual Skills (I)			Practical and Professional Skills (P)			General and Transferable Skills (G)	
	1	2	1	2	6	1	5	8	1	2
Lectures	●	●	●							
Tutorials	●	●	●	●	●	●	●	●		
Reports and Assignments	●	●		●	●	●	●	●	●	●
Laboratories							●			
Presentations						●	●		●	

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 370	Course Title: **Construction Surveying**	**Academic Year/Level:** **2nd** year / **4th** Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 1 **Lab** 1	

2- Course Aim	To familiarize the student with the engineering applications of surveying instruments and methods in the layout of the construction of engineering projects and setting out techniques. Through using ;communication technologies and skills, engineering technologies, data collection and interpretation, and writing technical reports referring to the relevant literature
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I2) Think in a creative and innovative way in problem solving and design. • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G2) Work in stressful environment and within constraints.

4- Course Content	Week No. 1: General introduction, Basic principles of surveying and plan scales Week No. 2: Measurement of distances and linear surveying techniques Week No. 3: Bearing of surveying lines. Week No. 4: Rectangular Coordinates Calculation Week No. 5: Area calculation of closed traverse Week No. 6: Application of practical surveying problems Week No. 7: Compass traversing, 7th Week Exam. Week No. 8: Theodolite Traversing Week No. 9: Profile Leveling, Rise and Fall Method Week No. 10: Profile Leveling, HPC Method Week No. 11: Contouring, contour lines, contour interval, properties, reading, cross sections. Week No. 12: Drawing Contour Maps 12th Week Exam. Week No. 13: SURFER Software for Contouring. Week No. 14: Volume Calculation for Earthwork in Construction Site using Spot Levels Week No. 15: Volume Calculation for Earthwork for Longitudinal Construction Projects Week No. 16: Final Exam
5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets • Laboratories
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets • Laboratories Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**9.** 1 **Written Examinations** **10. Assignments** **11. Reports** 12. **Presentations Skills.**
b- Schedule:	**53.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **54.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **55.Assessment 3 Semester Work Assessment (10 points)**

	• Attendance (5 points) • Group report (5 points) **56.Assessment 4 Final Exam** **(40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	Handout of the presentation slides
b- Required Books (Textbooks)	• Surveying for Construction by William Irvine,Finlay Maclennan,5th edition, Publisher: McGraw-Hill , London, 2006.
c- Recommended Books	• Surveying for Construction by William Irvine , FRICS Publisher: McGraw-Hill , London, Latest Edition. • Surveying, by A. Bannister and S. Raymond Publisher: Pitman, London, Latest Edition. • Elementary Surveying, by Paul R. Wolf and Russell C. Brinker, Publisher: Prentice Hall, Inc. Latest Edition. • Surveying, Fourth Edition by Jack McCormac Publisher: Prentice Hall Inc. Latest Edition.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Akram Soltan Kotb
Dr.Ayman Fouad Ragab

Program Manager:

Dr. Akram Soltan Kotb

Head Of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs								
	Knowledge and Understanding (K)		Intellectual Skills (I)			Practical and Professional Skills (P)		General and transferable Skills (G)	
	1	5	1	2	6	1	5	1	2
Written Examinations	●	●	●	●	●	●			
Assignments	●	●	●	●	●	●			
Reports							●	●	●
Presentations							●	●	

Learning Strategy	Course ILOs								
	Knowledge and Understanding (K)		Intellectual Skills (I)			Practical and Professional Skills (P)		General and Transferable Skills (G)	
	1	5	1	2	6	1	5	1	2
Lectures	●		●						
Tutorials	●	●	●	●	●	●	●		
Reports and Assignments	●	●		●	●	●	●	●	●
Laboratories							●		
Presentations						●	●	●	

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 472	Course Title: **Transportation and Traffic Engineering**	**Academic Year/Level:** 4th year / 7th Semester
	Prerequisites :CB271 surv.I	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	This course is designed to introduce seniors in construction engineering to Transportation Engineering, Transportation Planning Techniques and Basics in Traffic engineering Design. Through using ;communication technologies and skills, engineering technologies, data collection and interpretation, and writing technical reports referring to the relevant literature
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G3) Communicate effectively. • G9) Refer to relevant literatures.

4- Course Content	Week No. 1: General introduction, Transportation Systems, its Elements and Review of Mechanics Week No. 2: Individual Transportation Vehicle Motion, Inherent, Gradient and Curvature Resistance Week No. 3: Concept of Tractate effort [propulsive force], Prediction of Vehicle performance Week No. 4: Transportation Networks, Nodes, Links, Arcs, Connection Matrix, Minimum Path Route Week No. 5: Transportation Vehicle Flow, Time – Space Diagrams, Application in Airport Engineering Week No. 6: Time – Space Diagrams, Application in Railway, Application in Highway. Fundamental Flow Relationships Week No. 7: Fundamental Flow Relationships. 7th Week Exam Week No. 8: Models of Traffic Flow. Week No. 9: Queuing Theory and Traffic Flow Analysis. Week No. 10: Traffic Analysis of Signalized Intersections. Week No. 11: Concept of Engineering Planning and application in the field of Transportation Engineering. Week No. 12: Trip Generation Modeling, Statistical Analysis studies, Zone-based, house-hold based Modeling, trip classification, polynomial modeling. Week No. 13: Trip Distribution Modeling , Gravity Model, Calibration, Iteration Week No. 14: Modal Choice, Split Model, Probability analysis studies Week No. 15: Transportation Network Assignments, 12th Week Exam Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**13. Written Examinations** **14. Assignments** **15. Reports** 16. **Presentations**

b- Assessment Schedule:	**57.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **58.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **59.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **60.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	Handout of the presentation slides.
b- Required Books (Textbooks)	• Fundamentals of Transportation engineering by Jon D Fricker and Robert K Whitford, Publisher: Pearson Education, Inc., Pearson Prentice Hall, Upper Saddle River, NJ USA, 2004
c- Recommended Books	• Traffic and Highway Engineering by Nicholas J. Garber and Lester A. Hoel Publisher: Latest Edition • Standard Handbook for Civil Engineers by F.S. Merritt (ed.) Publisher: McGraw Hill Co., New York, Latest Edition. • Urban Transportation System by Shunk, G.A. Publisher: Transportation Planning Handbook, Institute of Transportation Engineers, Latest Edition. • Transportation Engineering by P.H. Wright and N.J. Ashford Publisher: John Wiley and Sons Co., New York, Latest Edition.
d- Periodicals, Web Sites, …, etc.	N/A

Course Instructor:

Dr. Akram Soltan Kotb

Dr.Dalia Saeid

Program Manager:

Dr. Akram Soltan Kotb

Head Of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs								
	Knowledge and Understanding (K)		Intellectual Skills (I)		Practical and Professional Skills (P)		General and Transferable Skills (G)		
	1	5	2	6	1	5	1	3	9
Written Examinations	●	●	●	●	●				
Assignments	●	●	●	●	●				
Reports						●	●	●	●
Presentations						●	●		

Learning Strategy	Course ILOs								
	Knowledge and Understanding (K)		Intellectual Skills (I)		Practical and Professional Skills (P)		General and Transferable Skills (G)		
	1	5	2	6	1	5	1	3	9
Lectures	●								
Tutorials	●	●	●	●	●	●			
Reports and Assignments	●	●	●	●	●	●	●	●	●
Presentations					●	●	●	●	

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 474	Course Title: **Highway Design and Construction** Prerequisites: CB472 Transportation.	**Academic Year/Level:** 4th year / 8th Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the fundamentals of highway Engineering and its relation to the field of transportation. Through using ;communication technologies and skills, engineering technologies, data collection and interpretation, and writing technical reports referring to the relevant literature
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K5) Methodologies of solving engineering problems, data collection and interpretation.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G2) Work in stressful environment and within constraints. • G6) Effectively manage tasks, time, and resources. • G9) Refer to relevant literatures.

4- Course Content	Week No. 1: Highway Classification and Process of location Selection. Week No. 2: Introduction to geometric design of highways, horizontal alignment and super-elevation calculations. Week No. 3: AASHTO Stopping Sight Distance, Passing Sight Distance, Vertical Alignment, Sag/Crest Vertical Curves. Week No. 4-5: Highway Intersections (1,2). Week No. 6: Principles of traffic flow and level of services (LOS). Week No. 7: Capacity of highway Segments I Multi-lane Highway. Week No. 8: Capacity of highway Segments II Two-lane Highway. Week No. 9: Capacity of at grade intersection and Design of Traffic Signals Week No. 10: Soil Engineering for Highway Design, California Bearing Ratio Test, Bituminous Material, Common tests , MCO , etc . Week No. 11: Marshall Test for asphalt mixtures and design of mix. Traffic load Transformation and Concept of equivalent single Axle load (ESAL) Week No. 12: Rigid vs. Flexible pavement and Design of flexible pavement, Classical Methods. Design of Flexible Pavements, AASHTO method , Pavement Management. Week No. 13: Highway Linear Scheduling technique and application Week No. 14: Highway Construction and Equipment. Week No. 15: Highway Pavement Common Distresses and repair Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**17. Written Examinations** **18. Assignments** **19. Reports** 20. **Presentations.**
b- Assessment Schedule:	**61.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **62.Assessment 2 12th Week Assessment (20 points)** • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **63.Assessment 3 Semester Work Assessment (10 points)**

	• Attendance (5 points) • Group report (5 points) **64.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	Handout of the presentation slides
b- Required Books (Textbooks)	• Highway Engineering by C.H. Oglesby and R.G. Hicks Publisher: John Wiley and Sons, NY. Latest Edition. • Standard Handbook for Civil Engineers by F.S. Merrit Publisher: McGraw Hill book NY
c- Recommended Books	• Highway Engineering by C.H. Oglesby and R.G. Hicks Publisher: John Wiley and Sons, NY. Latest Edition • Standard Handbook for Civil Engineers by F.S. Merrit Publisher: McGraw Hill book NY • Pavement Management for Airports, Roadsand Parking lots by M.Y.Shahin Publisher: Chapman and Hall, New York Latest Edition. • Egyptian Code for Highway by Ministry of Urban Planning Publisher: Latest Edition. • Transportation and traffic Engineering Handbook by Institute of transportation Engineers Publisher: Prentice - Hall Londan ", Latest Edition. • Handbook of Highway Engineering by R.Baker, van Nostrand Reinforced Co Publisher: New York, Latest Edition. • Pavement Management for Airports, Roadsand Parking lots by M.Y.Shahin Publisher: Chapman and Hall, New York Latest Edition. • Egyptian Code for Highway by Ministry of Urban Planning Publisher: Latest Edition. • Transportation and traffic Engineering Handbook by Institute of transportation Engineers Publisher: Prentice - Hall Londan ", Latest Edition. • Handbook of Highway Engineering by R.Baker, van Nostrand Reinforced Co Publisher: New York, Latest Edition.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Emad El Din Nabil

Program Manager:

Dr. Akram Soltan kotb

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs									
	Knowledge and Understanding (K)			Intellectual Skills (I)	Practical and Professional Skills (P)		General and Transferable Skills (G)			
	1	4	5	6	1	5	1	2	6	9
Written Examinations	●	●	●	●	●					
Assignments	●	●	●	●	●					
Reports						●	●	●		●
Presentations						●	●		●	

Learning Strategy	Course ILOs									
	Knowledge and Understanding (K)			Intellectual Skills (I)	Practical and Professional Skills (P)		General and Transferable Skills (G)			
	1	4	5	6	1	5	1	2	6	9
Lectures	●	●								
Tutorials	●	●	●	●	●	●			●	
Reports and Assignments	●	●	●	●	●	●	●	●	●	●
Presentations					●	●	●		●	

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- 1- Course Data

Course Code: CB 573	Course Title: **Construction Surveying II**	
	Prerequisites: CB271 Surv.I	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the fundamentals of highway Engineering and its relation to the field of transportation. Through using ;communication technologies and skills, engineering technologies, data collection and interpretation, and writing technical reports referring to the relevant literature
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I2) Think in a creative and innovative way in problem solving and design. • I6) Solve engineering problems, often on the basis of limited and possibly contradicting information. • I12) Identify and solve construction engineering problems.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.

d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G2) Work in stressful environment and within constraints.
4- Course Content	Week No. 1-2: Types of traverses, closed, open, link (connecting) (1,2). Week No. 3-4: Traverse nets and application in Construction Engineering (1,2). Week No. 5: The theodolite application Week No. 6-7: Automatic laser level, longitudinal and grid leveling, Precise leveling (1,2). Week No. 8: Mass diagram and mass profile of distribution diagram, properties of mass diagram, free haul, over haul distance. Week No. 9: Setting out Horizontal Curves with field applications. Week No. 10: Setting out Vertical Curves with field applications. Week No. 11: Basics of total station and various applications Week No. 12: Setting out Axes of Construction projects using total station Week No. 13: Geographic information system GIS and its application in Construction Engineering field. Week No. 14: Global positioning system and its application in Construction Engineering field Week No. 15: Review of Commercial Construction Surveying Software. Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**21. Written Examinations** **22. Assignments** **23. Reports** 24. **Presentations**
b- Schedule:	**65.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points) **66.Assessment 2 12th Week Assessment (20 points)**

	• Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **67.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **68.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7^{th} Week Assessment 30 % 12^{th} Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	Handout of the presentation slides.
b- Required Books (Textbooks)	• Surveying for Construction by William Irvine , 4^{th} edition, Publisher: McGraw-Hill , London, 1995.
c- Recommended Books	• Fundamentals of Geographic Information Systems by Michael N. DeMers Publisher: John Wiley and Sons , Inc. Latest Edition. • Surveying by A. Bannister and S. Raymond Publisher: Pitman ; London , Latest Edition. • Elementary Surveying by Paul R. Wolf and Russell C. Brinker Publisher: Prence Hall ,Inc. Latest Edition. • Surveying by Jack McCormac Publisher: Fourth Edition Prence Hall Inc. Latest Edition • Surveying for Construction by William Irvine , FRICS Publisher: McGraw-Hill , London, Latest Edition. • Fundamentals of Geographic Information Systems by Michael N. DeMers Publisher: John Wiley and Sons , Inc. Latest Edition. • Surveying by A. Bannister and S. Raymond Publisher: Pitman ; London , Latest Edition. • Elementary Surveying by Paul R. Wolf and Russell C. Brinker Publisher: Prence Hall ,Inc. Latest Edition. • Surveying by Jack McCormac Publisher: Fourth Edition Prence Hall Inc. Latest Edition
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor: **Program manager:**

Dr. Tamer Fathi Sorror Dr. Akram Soltan Kotb

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs								
	Knowledge and Understanding (K)		Intellectual Skills (I)			Practical and Professional Skills (P)		General and Transferable Skills (G)	
	1	5	2	6	12	1	5	1	2
Written Examinations	●	●	●	●	●	●			
Assignments	●	●	●	●	●	●			
Reports							●	●	●
Presentations							●	●	

Learning Strategy	Course ILOs								
	Knowledge and Understanding (K)		Intellectual Skills (I)			Practical and Professional Skills (P)		General and Transferable Skills (G)	
	1	5	2	6	12	1	5	1	2
Lectures	●				●				
Tutorials	●	●	●	●	●	●	●		
Reports and Assignments	●	●	●	●	●	●	●	●	●
Presentations						●	●		●

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 575	Course Title: **Special Topics in Transportation Engineering** Prerequisites: CB474 Highway Design	**Academic Year/Level:** 5th year / 10th Semester
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the fundamentals of Airport Railway planning and design and their relation to the field of transportation. Through using ;communication technologies and skills, engineering technologies, data collection and interpretation, and writing technical reports referring to the relevant literature
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I2) Think in a creative and innovative way in problem solving and design.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.

d- General and transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G2) Work in stressful environment and within constraints. • G3) Communicate effectively. • G6) Effectively manage tasks, time, and resources. • G9) Refer to relevant literatures.
4- Course Content	Week No. 1-2: Airport Classification and Site Selection, Wind Analysis and Wind Rose Construction (1,2). Week No. 3: Determination of runway basic length and corrections. Week No. 4-5: Aircraft Classification and Characteristics, Components of Airport system and Services (1,2). Week No. 6: Overall Airport Site I, runway, taxiway, terminal Bldg. Week No. 7-8: Overall Airport Site II, Apron gate, Parking lots, strips, Runways and holding aprons configurations (1,2). Week No. 9: Classification of Airport Soils. Week No. 10: Design of Airport Flexible Pavements. Week No. 11: Railway Engineering, Definition, components of railway systems. Week No. 12: Railway alignment, track elements, cross section, basic of design. Week No. 13: Railway platforms, length, switching, signaling. Week No. 14: TMS, Transportation Management System, components, flowchart of analysis. Week No. 15: Review of Commercial Transportation, Highway, Airport, Railway Software. Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets <u>Academic Support:</u> An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**25. Written Examinations** **26. Assignments** **27. Reports** 28. **Presentations .**
b- Schedule:	**69.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points)

	70.Assessment 2 12th Week Assessment (20 points) • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **71.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **72.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	Handout of the presentation slides.
b- Required Books (Textbooks)	• The Planning and Design of Airports by R.Horonejeff, Publisher: McGraw-Hill Co.Inc 4th 1994
c- Recommended Books	• Standard Handbook for Civil Engineers by F.S.Merritt Publisher: McGraw Hill book NY, Latest Edition. • Pavement Management for Airports, Roadsand Parking Lots by M.Y.Shahin Publisher: Chapman and Hall, New York Latest Edition. • The Planning and Design of Airports by R.Horonejeff Publisher: McGraw-Hill Co.Inc. Latest Edition. • Standard Handbook for Civil Engineers by F.S.Merritt Publisher: McGraw Hill book NY, Latest Edition. • "Egyptian Code for Highways by Ministry of Urban Planning Publisher: Latest Edition.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Saad El geoushy

Program Manager:

Dr. Akram soltan kotb

Head of department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs										
	Knowledge and Understanding (K)		Intellectual Skills (I)		Practical and Professional Skills (P)		General and Transferable Skills (G)				
	1	5	1	2	1	5	1	2	3	6	9
Written Examinations	●	●	●	●	●						
Assignments	●	●	●	●	●						
Reports						●	●	●	●		●
Presentations						●	●			●	

Learning Strategy	Course ILOs										
	Knowledge and Understanding (K)		Intellectual Skills (I)		Practical and Professional Skills (P)		General and Transferable Skills (G)				
	1	5	1	2	1	5	1	2	3	6	9
Lectures	●		●							●	
Tutorials	●	●	●	●	●	●				●	
Reports and Assignments	●	●		●	●	●	●	●	●	●	●
Presentations					●	●	●		●		

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 576	Course Title: **Special Topics in Railway Engineering**	**Academic Year/Level:** 5th year / 10th Semester
	Prerequisites: CB472 Transportation	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at introducing the student to the fundamentals of Railway planning and design and their relation to the field of transportation.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K5) Methodologies of solving engineering problems, data collection and interpretation.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems. • I2) Think in a creative and innovative way in problem solving and design.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. • P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G1) Collaborate effectively within multidisciplinary team. • G2) Work in stressful environment and within constraints. • G3) Communicate effectively. • G6) Effectively manage tasks, time, and resources.

	• G9) Refer to relevant literatures.
4- Course Content	Week No. 1: Basic components of passenger and freight trains, tractive force, movement resistance Week No. 2: Acceleration and braking. Week No. 3: Basic principles of track alignment Week No. 4: Design of horizontal and vertical curve.. Week No. 5: Basic components track elements, jointed and welded rail design. Week No. 6: Sleeper and ballast design. Week No. 7: Railway turnouts. 7th Week Exam Week No. 8: Alignment of passenger and freight stations. Week No. 9: Locomotive and stabling yard, Sorting and marshalling yards Week No. 10: Railway signaling. Week No. 11: Train traffic management Week No. 12: Railway capacity. 12th Week Exam Week No. 13: Railway cost , Price and subsidy Week No. 14: Railway renewal and maintenance management Week No. 15: Track construction equipments Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Reports and sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents
7- Student Assessment:	
a- Procedures used:	**29. Written Examinations** **30. Assignments** **31. Reports** 32. **Presentations .**
b- Schedule:	**73.Assessment 1 7th Week Assessment : (30 points)** • Assignments (1,2,3) (5 points) • Quizzes (1, 2) (5 points) • 7th week exam (20 points)

	74.Assessment 2 12th Week Assessment (20 points) • Assignments (4) (3 points) • Quizzes (3) (2 points) • 12th week exam (15 points) **75.Assessment 3 Semester Work Assessment (10 points)** • Attendance (5 points) • Group report (5 points) **76.Assessment 4 Final Exam (40 points)** • Final Written Exam (40 points)
c- Weighing of Assessment:	7th Week Assessment 30 % 12th Week Assessment 20 % Final Exam 40 % Semester Work Assessment 10 % Total 100%
8- List of References:	
a- Course Notes	Handout of the presentation slides.
b- Required Books (Textbooks)	• Modern Railway Track, second edition by Coenraad Esveld Publisher: MRT-production.2001.
c- Recommended Books	• Standard Handbook for Civil Engineers by F.S.Merritt Publisher: McGraw Hill book NY, 1983. • Railway Engineering by Hemeda and Salem, Alexandria University, 2002.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Akram Soltan Kotb

Program Manager:

Dr. Akram Soltan Kotb

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs										
	Knowledge and Understanding (K)		Intellectual Skills (I)		Practical and Professional Skills (P)		General and Transferable Skills (G)				
	1	5	1	2	1	5	1	2	3	6	9
Written Examinations	●	●	●	●	●						
Assignments	●	●	●	●	●						
Reports						●	●	●	●		●
Presentations						●	●			●	

Learning Strategy	Course ILOs										
	Knowledge and Understanding (K)		Intellectual Skills (I)		Practical and Professional Skills (P)		General and Transferable Skills (G)				
	1	5	1	2	1	5	1	2	3	6	9
Lectures	●		●							●	
Tutorials	●	●	●	●	●	●				●	
Reports and Assignments	●	●		●	●	●	●	●	●	●	●
Presentations					●	●	●		●		

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 281	Course Title: **Hydraulics for Civil Engineering**	**Academic Year/Level:** 2nd year / 4th Semester
	Prerequisites: BA114 Physics II	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2 **Lab** 2	

2- Course Aim	To provide the student with the basic concepts and methods of analysis of hydraulics and its applications in the sustainable design of civil engineering projects.
3- Intended Learning Outcome	
a- Knowledge and Understanding	K11) Professional ethics and impacts of engineering solutions on society and environment K3) Characteristics of engineering materials related to the discipline. K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. K4) Principles of design including elements design, process and/or a system related to specific disciplines. K5) Methodologies of solving engineering problems, data collection and interpretation K8) Current engineering technologies as related to disciplines.

b- Intellectual Skills	I2) Think in a creative and innovative way in problem solving and design. I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** P14) Use laboratory and field equipment competently and safely. P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** G3) Communicate effectively. G9) Refer to relevant literatures.

4- Course Content	Week No. 1: Introduction to hydraulic aspects in civil engineering projects and its ecosystem environment. Week No. 2: Properties of fluid(s), sediment-laden liquids and units. Week No. 3: Behavior of real fluid flow. Week No. 4-5: Hydrostatics and fluid forces. Week No. 6: Flow conservative equations; Mass, Momentum and Energy Equations. Week No. 7-8: Application of flow conservative equations. Week No. 9: Flow in single pipes. Week No. 10: Flow in pipe systems. Week No. 11: Pumps (in parallel and in series) Week No. 12: Pump-pipeline system analysis. Week No. 13: Free surface flow in open channels and flow types. Week No. 14: Introduction to basic design of uniform channel surface flow. Week No. 15: Introduction to main physical parameters of Ecosystems. Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets • Laboratories

6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Sheets • Laboratories Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents.
7- Student Assessment:	
a- Procedures used:	1- Written Examinations to assess The Intended Learning Outcomes. 2- Class Activities (Reports, Discussions) to assess The Intellectual Skills.
b- Schedule:	**Assessment 1** 7th Week assessment **Assessment 2** 12th Week assessment **Assessment 3** semester work assessment **Assessment 4** final Exam
c- Weighing of Assessment:	**77.Assessment 1 7th Week assessment: (30 points)** • Assignments (1,2,3,and 4) (5 points) • Quizzes (1, 2) (10 points) • 7th week exam (15 points) **78.Assessment 2 12th Week assessment: (20 points)** • Assignments (1 and 2) (5 points) • Quizzes (1) (5 points) • 12th week exam (10 points) **79.Assessment 3 Semester Work assessment (10 points)** • Attendance (5 points) • lap report (5 points) **80.Assessment 4 final exam (40 points)** • Final Written Exam (40 points)
8- List of References:	
a- Course Notes	Handout of the presentation slides.

b- Required Books (Textbooks)	Fundamentals of Hydraulic Engineering fourth edition by HOUGHTALEN, ROBERT. Publisher: Pearson Education, Inc., Pearson Prentice Hall, Upper Saddle River, NJ USA, 2010.
c- Recommended Books	• Fundamentals of Fluid Mechanics by Munson, B., Young, D. and Okiishi, T. Publisher: John Wiley and Sons, Inc., New Jersy, 2006. • Civil Engineering Hydraulics by Nalluri, C. and Featherstone, R. Publisher: Blackwell Science, MA, USA, 2001. • Computer Applications in Hydraulic Engineering-connecting theory to practice by Walski, M.T. (Ed) Publisher: Haestad Press, Waterbury, CT, U.S.A, 2002.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Prof. Dr. Wael Khedr

Dr.Hossam Hanafy

Course Coordinator:

Dr. Wael Khedr

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs												
	Knowledge and Understanding (K)						Intellectual Skills (I)		Practical and Professional Skills (P)			General and Transferable Skills (G)	
	1	3	4	5	8	11	1	2	1	5	14	3	9
Written Tests	x	x	x	x	x		x	x	x	x	x	x	x
Reports		x	x								x	x	x
Oral Test		x	x									x	x

Learning Strategy	Course ILOs												
	Knowledge and Understanding (K)						Intellectual Skills (I)		Practical and Professional Skills (P)			General and Transferable Skills (G)	
	1	3	4	5	8	11	1	2	1	5	14	3	9
lectures	x	x	x	x	x	x	x	x					
lab		x	x								x	x	x
section	x	x	x	x	x		x	x	x	x	x	x	x

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 382	Course Title: **Water Resources Engineering**	**Academic Year/Level:** 3rd year / 5th Semester
	Prerequisites: CB281 Water Res.	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 4 **Practical** 2	

2- Course Aim	This course is designed to provide the students with the fundamentals of hydrology, water resources engineering and water resources management.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** K11) Professional ethics and impacts of engineering solutions on society and environment K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. K4) Principles of design including elements design, process and/or a system related to specific disciplines. K16) Principles of design specific to construction and building.

b- Intellectual Skills	**Through intellectual skills, students will be able to:** 13) Solve environmental and socioeconomic problems. I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects. I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. I10) Analyze results of numerical models and assess their limitations.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. P7) Apply numerical modeling methods to engineering problems. P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. P14) Use laboratory and field equipment competently and safely.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** G3) Communicate effectively. G9) Refer to relevant literatures

4- Course Content	Week No. 1: Fields and management challenges of water resources (quality and quantity) for the municipal, industrial and agricultural sectors. Week No. 2: Watershed descriptive hydrology and measurements. Week No. 3: Quantitative hydrology and principles of sustainability. Week No. 4: Quantitative surface water hydrology. Week No. 5: Groundwater hydrology, and principles of sustainability. Week No. 6: Groundwater engineering Week No. 7: Flow regimes in natural and open channel streams and sediment transport. Week No. 8: Design of water supply open channels uniform flow Week No. 9: Design of water supply open channels: non-uniform flow. Week No. 10: Reservoirs and lakes. Week No. 11: Hydraulic structures for water resources management. Week No. 12: Hydraulic structures: Week No. 13: Flood-damage mitigation structures and storm-water management. Week No. 14: Sustainability of water resources management and effects of global climate change. Week No. 15: Case studies of water resources development and water quality management. Week No. 16: Final Exam. .
5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets

6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents.
7- Student Assessment:	
a- Procedures used:	3- Written Examinations to assess The Intended Learning Outcomes. 4- Class Activities (Reports, Discussions) to assess The Intellectual Skills.
b- Schedule:	**Assessment 1** 7th Week assessment **Assessment 2** 12th Week assessment **Assessment 3** semester work assessment **Assessment 4** final Exam
c- Weighing of Assessment:	**81.Assessment 1 7th Week assessment: (30 points)** • Assignments (1,2,3,and 4) (5 points) • Quizzes (1, 2) (10 points) • 7th week exam (15 points) **82.Assessment 2 12th Week assessment: (20 points)** • Assignments (1 and 2) (5 points) • Quizzes (1) (5 points) • 12th week exam (10 points) **83.Assessment 3 Semester Work assessment (10 points)** • Attendance (5 points) • lap report (5 points) **84.Assessment 4 final exam (40 points)** • Final Written Exam (40 points)
8- List of References:	
a- Course Notes	Handout of the presentation slides.
b- Required Books (Textbooks)	• HYDROLOGY AND HYDRAULIC SYSTEMS -GUPTA, RAM S - WAVELAND PRESS - 2008 • Water Resources Engineering 2nd edition by Iarry W. Mays, Publisher: John Wiley, 2004.

c- Recommended Books	• Flood Risk Management by G. Fleming, ed., ICE, Thomas Telford Publisher: London, U.K., 2000 • Integrated Watershed Management in the Global Ecosystem by Lal, R., ed., CRC Press Publisher: Boca Raton, USA, 2000. • Computer Applications in Hydraulic Engineering-connecting theory to practice by Walski, M.T. (Ed), Haestad Press Publisher: Waterbury, CT, U.S.A., 2002 • Water Resources Engineering by R.Linsley, J.B. Franzini D.L. Freyberg and G. Publisher: Tchobanoglous, McGraw-Hill, Inc., New York, 1992.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Prof. Dr. Wael Mohamed Hamdy Khadr

Dr. Ehab El ganzory

Course Coordinator:

Dr. Wael Khedr

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs															
	Knowledge and Understanding (K)				Intellectual Skills (I)						Practical and Professional Skills (P)				General and Transferable Skills (G)	
	1	4	11	16	3	4	8	10	13	16	1	5	7	14	3	9
Written Tests	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x
Reports	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x

Learning Strategy	Course ILOs															
	Knowledge and Understanding (K)				Intellectual Skills (I)						Practical and Professional Skills (P)				General and Transferable Skills (G)	
	1	4	11	16	3	4	8	10	13	16	1	5	7	14	3	9
Lectures	x	x	x	x	x	x	x	x	x	x						
Section	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 483	Course Title: **Irrigation and Drainage**	**Academic Year/Level:** 4th year / 7th semester
	Prerequisites: CB382 Water res.	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 4 **Practical** 2	

2- Course Aim	The course is designed to teach essentials of planning, selection and design of irrigation and drainage systems and other related topics related to the sustainable management of water resources and disposal or reuse of drainage waters as sectors of water resources system.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. K4) Principles of design including elements design, process and/or a system related to specific disciplines. K6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. K8) Current engineering technologies as related to disciplines. K11) Professional ethics and impacts of engineering solutions on society and environment
b- Intellectual Skills	**Through intellectual skills, students will be able to:** I2) Think in a creative and innovative way in problem solving and design. I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. I13) Solve environmental and socioeconomic problems. I8) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.

	I14) Determine levels, types and systems of building foundations. Determine levels, types and systems of building foundations based on geotechnical techniques and codes of practice.

c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. P17) Prepare technical drafts and finished drawings both manually and using CAD.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** G3) Communicate effectively. G9) Refer to relevant literatures.

4- Course Content	Week No. 1:	Water requirements for irrigation and overview of irrigation systems and agricultural and urban drainage system.
	Week No. 2:	Introduction to sustainability of irrigation and drainage ecosystems. Overview of irrigation and drainage structures.
	Week No. 3:	Soil-Water-Crop relationship.
	Week No. 4:	Crop water requirements:
	Week No. 5:	Synoptic diagram for surface irrigation and drainage systems.
	Week No. 6:	Design of cross-sections for surface irrigation channels.
	Week No. 7:	Design of cross-sections for surface (storm) drainage channels.
	Week No. 8:	Water conservation-Introduction to sprinkler and drip irrigation systems and water management.
	Week No. 9:	Selection of sprinkler and drip irrigation systems components;
	Week No. 10:	Sprinkler irrigation systems.
	Week No. 11:	Drip irrigation systems.
	Week No. 12:	Drip irrigation systems.
	Week No. 13:	Drainage system, planning, design, construction and operation of subsurface and land drainage.
	Week No. 14:	Quality of drainage water and impact on fresh water resources and coastal waters.
	Week No. 15:	Review of case studies for irrigation and drainage projects.
	Week No. 16:	Final Exam.
	.	

5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents.
7- Student Assessment:	
a- Procedures used:	5- Written Examinations to assess The Intended Learning Outcomes. 6- Class Activities (Reports, Discussions,…..) to assess the Intellectual Skills.
b- Schedule:	**Assessment 1** 7th Week assessment **Assessment 2** 12th Week assessment **Assessment 3** semester work assessment **Assessment 4** final Exam
c- Weighing of Assessment:	**85.Assessment 1 7th Week assessment: (30 points)** • Assignments (1,2,3,and 4) (5 points) • Quizzes (1, 2) (10 points) • 7th week exam (15 points) **86.Assessment 2 12th Week assessment: (20 points)** • Assignments (1 and 2) (5 points) • Quizzes (1) (5 points) • 12th week exam (10 points) **87.Assessment 3 Semester Work assessment (10 points)** • Attendance (5 points) • lap report (5 points) **88.Assessment 4 final exam (40 points)** • Final Written Exam (40 points)
8- List of References:	
a- Course Notes	Handout of the presentation slides.

b- Required Books (Textbooks)	• Irrigation Engineering by Sharma, R. and Sharma T., Publisher: S. Chand and Company Ltd., New Delhi, Latest Edition. 2002
c- Recommended Books	• Water Resources Engineering by Linsley, R.L. Franzini, J.B. Freyberg J. and Tchobanogolous G. Publisher: McGraw-Hill Co., New York, 1992. • Elementary Soil and Water Engineering by Schwab, G.O., Frevert, R.K., Publisher: John Wiley and Sons, Inc., 1985. • Computer Applications in Hydraulic Engineering-connecting theory to practice by Walski, M.T.; Publisher: Haestad Press, Waterbury, CT, U.S.A., 2002. • Irrigation and Drainage by Neil Southorn Publisher: Butterworth Publishing Co, UK, 1998. •
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Ehab Mostafa Fatouh El-Ganzoury

Dr.Abd Elhameed El Tahaan

Course Coordinator:

Dr. Wael Khedr

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs													
	Knowledge and Understanding (K)					Intellectual Skills (I)				Practical and Professional Skills (P)			General and Transferable Skills (G)	
	1	4	6	8	11	2	3	13	14	1	5	17	3	9
Written Tests	x	x	x	x		x	x	x	x	x	x		x	x
Other	x	x	x	x		x	x	x	x	x	x	x	x	x

Learning Strategy	Course ILOs													
	Knowledge and Understanding (K)					Intellectual Skills (I)				Practical and Professional Skills (P)			General and Transferable Skills (G)	
	1	4	6	8	11	2	3	13	14	1	5	17	3	9
Lectures	x	x	x	x	x	x	x	x	x					
Other	x	x	x	x		x	x	x	x	x	x	x	x	x

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 485	Course Title: **Design and Construction of Coastal Structures**	**Academic Year/Level:** 4th year / 8th semester
	Prerequisites: CB281 Hydraulics	
Specialization: Construction and Building Engineering	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	The course aims at acquainting the student of construction engineering to the knowledge of fundamental and methods of designing coastal protection structures and shoreline facilities. Further the course introduces the students to the principles of coastal zone management and construction aspects of major structures.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. • K11) Professional ethics and impacts of engineering solutions on society and environment • K5) Methodologies of solving engineering problems, data collection and interpretation • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K16) Principles of design specific to construction and building.

	• K13)The essential construction processes and the technologies and techniques used in the construction and building engineering field.
b- Intellectual Skills	**Through intellectual skills, students will be able to:** I13) Solve environmental and socioeconomic problems. I9) Incorporate economic, societal, environmental dimensions and risk management in design. I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. P5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results. P12) Prepare and present technical reports.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** G9) Refer to relevant literatures. G3) Communicate effectively.

4- Course Content	Week No. 1: Introduction to coastal engineering; environment and types of coastal structures. Week No. 2-3: Wind, tide, currents and surface wave hydrodynamics; elementary and finite amplitude waves Week No. 4: Wind generated waves; prediction and forecast. Week No. 5: Modification of wave characteristics in shoaling waters and sea level changes. Week No. 6: Coastal processes and sediment transport (erosion and accretion). Week No. 7: Introduction to coastal zone management and sustainability of coastal projects. Week No. 8-9: Wind and wave-current hydrodynamic forces. Week No. 10: Introduction to port and harbor planning and offshore terminals. Week No. 11: Port and Harbor facilities; breakwaters, piers and terminals etc. Week No. 12-13: Design and construction of breakwaters, seawalls and groins (rigid/ flexible). Week No. 14: Marine construction: methods, materials and equipment. Week No. 15: Environmental effects on coastal zone management; e.g.: Effects of sea level rise Week No. 16: Final Exam.
5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets
6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Sheets Academic Support: An academic supervisor is appointed for handicapped students. Constant follow up should be done for handicapped students after each assessment to evaluate their academic contents.
7- Student Assessment:	
a- Procedures used:	7- Written Examinations to assess The Intended Learning Outcomes. 8- Class Activities (Reports, Discussions,…..) to assess the Intellectual Skills.
b- Schedule:	**Assessment 1** 7th Week assessment **Assessment 2** 12th Week assessment **Assessment 3** semester work assessment **Assessment 4** final Exam
c- Weighing of Assessment:	**89.Assessment 1 7th Week assessment: (30 points)** • Assignments (1,2,3,and 4) (5 points) • Quizzes (1, 2) (10 points) • 7th week exam (15 points)

	90.Assessment 2 12th Week assessment: (20 points) • Assignments (1 and 2) (5 points) • Quizzes (1) (5 points) • 12th week exam (10 points) **91.Assessment 3 Semester Work assessment (10 points)** • Attendance (5 points) • lap report (5 points) **92.Assessment 4 final exam (40 points)** • Final Written Exam (40 points)
8- List of References:	
a- Course Notes	• Handout of the presentation slides.
b- Required Books (Textbooks)	• Introduction to Coastal Engineering and Management by J.W. Kamphuis Publisher: World Scientific Publishing Co., NJ, USA, 2001.
c- Recommended Books	• Coastal Defense-ICE design and practice guide by Brampton Publisher: Thomas-Telford, London, 2002. • Hydraulics in Civil and Environmental Engineering by A. Chadwick and A.J. Morfett, Spon Publisher: London, New York, 2002. • Coastal Engineering-processes, theory and design practice by D. Reeve, A. Chadwick and C. Fleming, Spon Publisher: Press, London and New York, 2004. • Port Engineering by Per Bruun, Gulf Publishing Co. Publisher: Houston, USA, 1981. • Construction Risk in Coastal Engineering by ed. J. Simm and I. Cruickshank Publisher: Thomas Telford, U.K., 1998. • Oceanographical Engineering by R.L. Wiegel Publisher: Prentice-Hall, Inc., Englewood Cliffs, New Jersey, USA, 1964; reprint, 2005.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Yasser Mohamed Sadek El-Saei

Course Coordinator:

Dr. Wael Khedr

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs													
	Knowledge and Understanding (K)						Intellectual Skills (I)			Practical and Professional Skills (P)			General and Transferable Skills (G)	
	1	4	5	11	13	16	3	9	13	1	5	12	3	9
Written Tests	x	x	x		x	x	x	x	x	x	x	x	x	x
Reports	x	x	x		x	x	x	x	x	x	x	x	x	x

Learning Strategy	Course ILOs													
	Knowledge and Understanding (K)						Intellectual Skills (I)			Practical and Professional Skills (P)			General and Transferable Skills (G)	
	1	4	5	11	13	16	3	9	13	1	5	12	3	9
Lectures	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Sections	x	x	x		x	x	x	x	x	x	x	x	x	x

Arab Academy for Science, Technology and Maritime Transport
College of Engineering and Technology – (Cairo Branch)
Construction and Building Engineering Department

University/Academy: Arab Academy for Science, Technology and Maritime Transport
Faculty/Institute: College of Engineering and Technology
Program: Construction and Building Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code: CB 584	Course Title: **Special Topics in Hydraulic and Coastal Structures**	**Academic Year/Level:** **5th** year / **9 th** semester
	Prerequisites: CB483 Irrigation.	
Specialization: **Construction and Building Engineering**	**No. of Instructional Units:** **Lecture** 2 **Practical** 2	

2- Course Aim	This course is designed to provide the seniors in construction engineering program with the design criteria and construction methods of major structures and operations in rivers, estuary and coastal waters.
3- Intended Learning Outcome	
a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** • K4) Principles of design including elements design, process and/or a system related to specific disciplines. • K16) Principles of design specific to construction and building. • K13) The essential construction processes and the technologies and techniques used in the construction and building engineering field. • K11) Professional ethics and impacts of engineering solutions on society and environment
b- Intellectual Skills	**Through intellectual skills, students will be able to:** • I3) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. • I12) Identify and solve construction engineering problems. • I13) Solve environmental and socioeconomic problems. • I18) Suggest solutions and designs on a conceptual level and in detail that consider sustainability and other issues of importance • I16) Solve a wide range of problems related to the analysis, design, and the construction of buildings and civil engineering projects.

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c- Practical and Professional Skills	**Through professional and practical skills, students will be able to:** • P4) Practice the neatness and aesthetics in design and approach. • P9) Demonstrate basic organizational and project management skills. • P10) Apply quality assurance procedures and follow codes and standards. • P12) Prepare and present technical reports.
d- General and Transferable Skills	**Through general and transferable skills, students will be able to:** • G3) Communicate effectively. • G9) Refer to relevant literatures.

4- Course Content	Week No. 1: Engineering projects for river and estuary structures. Week No. 2: Engineering projects for coastal structures. Week No. 3: Design criteria and construction of lined open channels. Week No. 4: Design and construction of water intake and navigation structures. Week No. 5: Design criteria and construction of piers for over water bridges and scour mitigation methods. Week No. 6: Design criteria and construction of river flow diversion structures. Week No. 7: Design and construction of drainage structures. Week No. 8: Integrated coastal zone management. Week No. 9: Design criteria and installation of marine pile-supported and bulkhead structures. Week No. 10: Design criteria and types of coastal protection works (rigid and flexible). Week No. 11: Construction methods of shore-connected and offshore protection structures. Week No. 12: Construction methods of shore-connected and offshore protection structures. Week No. 13: Beach nourishment techniques and equipment. Week No. 14: Ecological and social impacts of river and coastal construction. Week No. 15: Term report presentation. Week No. 16: Final Exam. .
5- Teaching and Learning Methods	• Lectures • Tutorials • Sheets

6- Teaching and Learning Methods for Students with Special Needs	• Lectures • Tutorials • Sheets Engineering Requirements and design Considerations in School Buildings and its Leading Passages are as indicated in Appendix A.
7- Student Assessment:	
a- Procedures used:	9- Written Examinations to assess The Intended Learning Outcomes. 10-Class Activities (Reports, Discussions,…..) to assess the Intellectual Skills.
b- Schedule:	**Assessment 1** 7th Week assessment **Assessment 2** 12th Week assessment **Assessment 3** semester work assessment **Assessment 4** final Exam
c- Weighing of Assessment:	**93.Assessment 1 7th Week assessment: (30 points)** • Assignments (1,2,3,and 4) (5 points) • Quizzes (1, 2) (10 points) • 7th week exam (15 points) **94.Assessment 2 12th Week assessment: (20 points)** • Assignments (1 and 2) (5 points) • Quizzes (1) (5 points) • 12th week exam (10 points) **95.Assessment 3 Semester Work assessment (10 points)** • Attendance (5 points) • lap report (5 points) **96.Assessment 4 final exam (40 points)** • Final Written Exam (40 points)
8- List of References:	
a- Course Notes	• Handout of the presentation slides.
b- Required Books (Textbooks)	• Hydraulic Structures by Novak, K., Moffat, A., Nalluri, C. and Narayanan, R., Spon Publisher: Press, New York, USA, 2004. • Introduction to Coastal Engineering and Management by J.W. Kamphuis Publisher: World Scientific Publishing Co., NJ, USA,

	2004.
c- Recommended Books	• Coastal Defense-ICE design and practice guide by A. Brampton Publisher: Thomas-Telford, London, 2002. • Construction of Marine and Offshore Structures by Ben C. Gerwick, Jr., CRC Publisher: Press, New York, USA, 2nd edition, 2002. • Construction Risk in Coastal Engineering by ed. J. Simm and I. Cruickshank Publisher: Thomas Telford, U.K., 1998.
d- Periodicals, Web Sites, ..., etc.	N/A

Course Instructor:

Dr. Yasser Mohamed Sadek El-Saei

Course Coordinator:

Dr. Wael Khedr

Head of Department:

Dr. Adel Mahmoud Belal

Assessment Tools	Course ILOs														
	Knowledge and Understanding (K)				Intellectual Skills (I)					Practical and Professional Skills (P)				General and Transferable Skills (G)	
	4	11	13	16	3	6	8	9	13	4	9	10	12	3	9
Written Tests	x		x	x	x	x	x	x	x	x	x	x	x	x	x
Reports	X		x	x	x	x	x	x	x	x	x	x	x	x	x
Oral Test	x		x	x	x	x	x	x	x	x	x	x	x	x	x

Learning Strategy	Course ILOs														
	Knowledge and Understanding (K)				Intellectual Skills (I)					Practical and Professional Skills (P)				General and Transferable Skills (G)	
	4	11	13	16	3	6	8	9	13	4	9	10	12	3	9
Lectures	x	x	x	x						x	x	x	x		
Sections	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Projects	x	x	x	x	x	x	x	x	x					x	x