Mathematics 1
(BAS011)

1- Basic Information:

Program Title	All programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mathematics1
Course Code	BAS011
Year/Level	Level: 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	2	-	4

2- Course Aims

No.	Aims
1	Master a broad range of Mathematics engineering knowledge and specialized skills of Algebra and Calculus, as well as the ability to apply acquired knowledge of Algebra and Calculus in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve mathematical engineering problems of varying systems models.

3- Competencies:

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**a1** Explain the relevant mathematical engineering principles and theories in the Algebra and Calculus. **b1** Use the mathematical engineering principles and theories that apply in the most fundamental problems . **a3** Explain the basic concepts of derivative and algebra.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	vectors algebra - partial fractions - equations theory	2	2	-	**8**
2	vectors - mathematical induction	2	2	-	**4**
3	Equations theory –Mathematical Deduction	4	4	-	**8**
4	numerical solutions methods (simple repetitive method - Newton and modified Newton's method - intersection method - False position method	4	4	-	**8**
5	Arrays - linear equations systems - Gauss Jordan method for deletion.	4	4	-	**8**
6	function (definition - theories) - basic trigonometric functions and its inverse - exponential and logarithmic functions	4	4	-	**8**
7	hyperbolic functions and its inverse - connection (definition - theories) - limits (definition - theories) - derivatives (definition - theories - higher order types)	4	4	-	**8**
8	- curves drawing - mathematical and engineering derivative applications - undefined formulas - Taylor expansion - MacLean expansion - approximation - introduction in partial derivation.	4	4	-	**4**
Total		**28**	**28**	**-**	**56**

5. Teaching and learning methods:

Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
vectors algebra - partial fractions - equations theory	x	x			x	x	x							
vectors - mathematical induction	x	x			x	x	x							
Equations theory – Mathematical Deduction	x	x			x	x	x							
numerical solutions methods (simple repetitive method - Newton and modified Newton's method - intersection method - False position method	x	x			x	x	x							
arrays - linear equations systems - Gauss Jordan method for deletion.	x	x			x	x	x							

function (definition - theories) - basic trigonometric functions and its inverse - exponential and logarithmic functions	x	x			x	x	X									
hyperbolic functions and its inverse - connection (definition - theories) - limits (definition - theories) - derivatives (definition - theories - higher order types)	x	x			x	x	X									
- curves drawing - mathematical and engineering derivative applications - undefined formulas - Taylor expansion - MacLean expansion - approximation - introduction in partial derivation.	x	x			x	x	X									

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low ,medium and high performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:
7.1 Student Evaluation methods:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,b1
2	Semester work(quizzes, sheets, report)	A1	b1
3	Final term examination	A1	a1,b1,a3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	7th - 9th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	30
2	Student load	30
3	Final term examination	90
Total		**150**

8. List of References:

No.	Reference List
1	Richard W. Fisher "No-Nonsense Algebra, 2nd Edition" Math Essentials; 2nd edition (2018).
2	William Briggs "Calculus: Early Transcendentals" Pearson; 3rd edition, (2018).

9. Facilities required for teaching and learning:

Facility			
1	Lecture classroom	3	White board

2	Seminar	4	Data Show system

10. Matrix of Competencies and LO's:

No	Topic	Aims	Competencies	LO's
1	vectors algebra - partial fractions - equations theory	1	A1	a1,b1
2	vectors - mathematical induction	1	A1	a1, b1
3	Equations theory –Mathematical Deduction	1	A1	a1,b1
4	numerical solutions methods (simple repetitive method - Newton and modified Newton's method - intersection method - False position method	1	A1	a1, b1
5	arrays - linear equations systems - Gauss Jordan method for deletion.	1	A1	a1,b1
6	function (definition - theories) - basic trigonometric functions and its inverse - exponential and logarithmic functions	1	A1	a3, b1
7	hyperbolic functions and its inverse - connection (definition - theories) - limits (definition - theories) - derivatives (definition - theories - higher order types)	1	A1	a3, b1
8	- curves drawing - mathematical and engineering derivative applications - undefined formulas - Taylor expansion - MacLean expansion - approximation - introduction in partial derivation.	1	A1	a1, b1

Course Coordinator: Dr / Reda Abdo
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Mechanics 1
(BAS012)

1-Basic Information:

Program Title	All programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mechanics 1
Course Code	BAS012
Year/Level	Level: 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	Lectures	Exercise	laboratory	Student's load
	2	2	-	4

2- Course Aims:

No.	Aims
1	Master a broad range of statics knowledge to apply it on force system, distributed forces and moment of inertia.
3	Use the techniques, skills, and current engineering tools required for engineering practice of Statics applications by taking full responsibility for one's own learning and development, participating in lifelong learning and consider the impact of statics study in real world, and its strong relation with environment and almost of all the technology fields upgrades.

3- Competencies:

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**a1** Define concepts and theories of space vectors, momentums, equivalent couples, and equation of equilibrium for rigid body. **a2** Recognize methodologies of solving equilibrium under the effect of forces. **b1** Solve engineering problems, such as finding the center of mass (group of particles – flat surfaces).

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Introduction to statics. Fundamental concept Basic quantities of unit dimension- System of units Space, Trigonometry and U.S. Customary units, Force. Statics of particle, Statics of Rigid Body, Free body diagrams. Types of forces, Types of system of forces	2	2	-	٥
2	Statics of particles Forces on a particle, Addition of vectors, Resultant of several concurrent forces.	2	2	-	٥
3	Resolution of a forces into components Rectangular components of a forces, (unit vectors). Addition of forces by summing X and Y components. Equilibrium of a particle, and Newton′s first law of motion.	2	2	-	٥
4	Problem involving the equilibrium of a practice-free body diagram. Rectangular components of a forces in space, force defined by its magnitude and two points on its line of action. Addition of concurrent forces in space, equilibrium of a particle in space.	2	2	-	٥
5	Rigid bodies: equivalent systems of forces. External and internal forces, principle of transmissibility and equivalent forces, vector product of two vectors, vector product expressed in terms of rectangular components	2	2	-	٥
6	Moment of a force about a point. Varignon′s theorem, rectangular components of the moment of a force, equivalent systems of forces.	4	4	-	٧

7	Equilibrium of rigid bodies Free- body diagram. Equilibrium of a rigid body in two dimensions.	2	2	-	٥
8	Equilibrium of three- dimension force body. Reduction of a system of forces to one force and one couple. Equilibrium of a rigid body in three dimensions. Reactions at supports and connections for a two- dimensional and for a three- dimensional structure.	4	4	-	٧
9	Centroids and centers of gravity. Centre of gravity of a two- dimensional body, centroids of area and lines, first moments of areas and lines, composite plates and wires.	4	4	-	٦
10	Analysis of structures Definition of truss Simple trusses Analysis of trusses by the method of joints	4	4	-	٦
Total		**28**	**28**	**-**	**56**

5. Teaching and learning methods:

Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab

Introduction to statics. Fundamental concept Basic quantities of unit dimension-System of units Space, Trigonometry and U.S.	**x**	**x**			**x**										
equivalent forces, vector product of two vectors, vector product expressed in terms of rectangular components															
Moment of a force about a point. Varignon᾽s theorem, rectangular components of the moment of a force, equivalent systems of forces.	**x**	**x**			**x**										

Equilibrium of rigid bodies Free- body diagram. Equilibrium of a rigid body in two dimensions.	X	X			X									
Equilibrium of three-dimension force body. Reduction of a system of forces to one force and one couple. Equilibrium of a rigid body in three dimensions. Reactions at supports and connections for a two-dimensional and for a three-dimensional structure.	X	X				X								
Centroids and centers of gravity. Centre of gravity of a two-	X	X			X	X								

dimensional body, centroids of area and lines, first moments of areas and lines, composite plates and wires.														
Analysis of structures Definition of truss Simple trusses Analysis of trusses by the method of join	x	x			x									

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low ,medium and high performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation methods:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,b1
2	Semester work(quizzes, sheets, report)	A1	a1,b1

3	Final term examination	A1	a1,a2,b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd -7th - 9th -14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	Student load	20
3	Final term examination	60
Total		**100**

8. List of References:

No.	Reference List
1	M. Abdullah Al Faruque, Bahar Zoghi, Sylvester A. Kalevela " Engineering statics" 1st edition, CRC Press (2019).
2	Bogachev, V., Smolyanov, Oleg G. "Topological Vector Spaces and Their Applications" Springer International Publishing (2017).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of Competencies and LO's of the course:

4	Problem involving the equilibrium of a practice- free body diagram. Rectangular components of a forces in space, force defined by its magnitude and two points on its line of action. Addition of concurrent forces in space, equilibrium of a particle in space.	3	A1	a2
5	Rigid bodies: equivalent systems of forces. External and internal forces, principle of transmissibility and equivalent forces, vector product of two vectors, vector product expressed in terms of rectangular components	1	A1	a1
6	Moment of a force about a point. Varignon's theorem, rectangular components of the moment of a force, equivalent systems of forces.	1	A1	a1
7	Equilibrium of rigid bodies Free- body diagram. Equilibrium of a rigid body in two dimensions.	3	A1	a2

8	Equilibrium of three- dimension force body. Reduction of a system of forces to one force and one couple. Equilibrium of a rigid body in three dimensions. Reactions at supports and connections for a two- dimensional and for a three-dimensional structure.	3	A1	a1,a2
9	Centroids and centers of gravity. Centre of gravity of a two- dimensional body, centroids of area	1	A1	b1
	and lines, first moments of areas and lines, composite plates and wires.			
10	Analysis of structures Definition of truss Simple trusses Analysis of trusses by the method of joints	3	A1	b1

Course Coordinator: Dr / Moataz Mostafa
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Physics1
(BAS013)

1-Basic Information:

Program Title	All programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Physics1
Course Code	BAS013
Year/Level	Level 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	Lectures	Exercise	laboratory	Student's load
	2	2	2	4

2- Course Aims:

No.	Aims
1	Mastery of a broad range of engineering physics knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories in critical and systemic analytical thinking to identify, diagnose, and solve engineering problems of varying complexity and variance.
4	Use the experimental techniques, skills, and current engineering tools required for engineering practice by taking full responsibility for one's own learning and development, participating in lifelong learning, and demonstrating the ability to pursue postgraduate and research studies.

3- Competencies:

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**a1** Explain concepts and theories of mathematics for physical quantities, unit's dimensional analysis and basics of thermodynamics. **a2** Recognize methodologies of solving problems for stress-strain diagram, and fluids study. **b1** Select the appropriate solutions for properties of materials through Brittle and Ductile material.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Physics and Measurement Practical: measurement methods	4	4	2	**8**
2	Mechanical properties for materials Practical: Hooks' Law	4	4	2	**8**
3	Oscillations Practical: simple pendulum.	4	4	2	**8**
4	Sounds. Practical: Resonance in the Air columns.	2	2	4	**4**
5	Fluids. Practical: Viscosity.	4	4	4	**8**
6	Heat transfer Practical: Heat& Specific Heat& thermoelectrical equivalent& the latent heat of melting ice.	2	2	6	**4**
7	The kinetic theory of gases and the work in thermodynamics Practical: melting point of solid materials.	2	2	4	**4**
8	The laws of thermodynamic Practical: heating and cooling curves.	4	4	2	**8**
9	Temperature and thermal expansion Practical: coefficient of linear thermal expansion.	2	2	2	**4**

| Total | | | | | | | | | 28 | | 28 | | 28 | | 56 | |

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Physics and Measurement Practical: measurement methods	x	x				x								x
2	Mechanical properties for materials Practical: Hooks' Law	x	x			x									x
3	Oscillations Practical: simple pendulum.	x	x					x							x
4	Sounds. Practical: Resonance in the Air columns.	x	x				x								x
5	Fluids. Practical: Viscosity.	x	x					x							x

6	Heat transfer Practical: Heat& Specific Heat& thermo-electrical equivalent& the latent heat of melting ice.	x	x			x										x
7	The kinetic theory of gases and the work in thermodynamics Practical: melting point of solid materials.	x	x														x
8	The laws of thermodynamic Practical: heating and cooling curves.	x	x				x										x
9	Temperature and thermal expansion Practical: coefficient of linear thermal expansion.	x	x					x									x

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium and high performance students.	Knowledge and skills transfer among different levels of students

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,a2,b1
2	Semester work(quizzes, sheets, report)	A1	a1,a2
3	Practical exam	A1	a2,b1
4	Final term examination	A1	a1,a2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	7th,9th
3	Practical examination	14th
4	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation method	Marks
1	Periodic exams	30
2	final examination	75
3	Practical examination	15
4	Student load	30
Total		**150**

8. List of References:

No.	Reference List
1	Peter J. Williams ; Firas Mansour ; Robert L. Hawkes ; (Nuclear physicist) Javed Iqbal ; Marina Milner-Bolotin. Physics for scientists and engineers : an interactive approach, Nelson Education Ltd., Year: 2019
2	David Halliday, Robert Resnick, Jearl Walker. Fundamentals of Physics, 9th Edition, Binder Ready Version,2019

| 3 | Serway, Raymond A., and John W. Jewett. Physics for scientists and engineers. Cengage learning, 2018. |
| 4 | Hibbeler, Russell C. "Mechanics of materials." (2018). |

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Laboratory
3	Presenter
4	White board
5	Data show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Introduction to statics. Fundamental concept Basic quantities of unit dimension- System of units Space, Trigonometry and U.S. Customary units, Force. Statics of particle, Statics of Rigid Body, Free body diagrams. Types of forces, Types of system of forces	1	A1	a1
2	Statics of particles Forces on a particle, Addition of vectors, Resultant of several concurrent forces.	1	A1	a1
3	Resolution of forces into components Rectangular components of forces, (unit vectors).Addition of forces by summing X and Y components. Equilibrium of a particle, and Newton's first law of motion.	٤	A1	a2

4	Problem involving the equilibrium of a practice- free body diagram. Rectangular components of a forces in space, force defined by its magnitude and two points on its line of action. Addition of concurrent forces in space, equilibrium of a particle in space.	٤	A1	a2
5	Rigid bodies: equivalent systems of forces. External and internal forces, principle of transmissibility and equivalent forces, vector product of two vectors, vector product expressed in terms of rectangular components	1	A1	a1
6	Moment of a force about a point. Varignon's theorem, rectangular components of the moment of a force, equivalent systems of forces.	1	A1	a1
7	Equilibrium of rigid bodies Free-body diagram. Equilibrium of a rigid body in two dimensions.	٤	A1	a2
8	Equilibrium of three- dimension force body.Reduction of a system of forces to one force and one couple. Equilibrium of a rigid body in three dimensions. Reactions at supports and connections for a two- dimensional and for a three- dimensional structure.	٤	A1	a1,a2

9	Centroids and centers of gravity. Centre of gravity of a twodimensional body, centroids of area and lines, first moments of areas and lines, composite plates and wires.	1	A1	b1
10	Analysis of structures Definition of truss Simple trusses Analysis of trusses by the method of joints	٤	A1	b1

Course Coordinator: Dr. Ahmed Lotfy
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Engineering chemistry
BAS014

1- Basic Information:

Program Title	All programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Engineering chemistry
Course Code	BAS014
Year/Level	Level: 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	-	2	4

2- Course Aims:

No.	Aims
1	Master a wide spectrum of engineering knowledge and specialized skills for applying acquired knowledge using theories and abstract thinking in real life situations.
8	Consider the impact of chemical process industries on society, economics, and the environment using fundamental knowledge of chemical process industries.

3- Competencies:

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals and basic science.	**a1** Describe the relevant Chemical principles and theories in the discipline. **c2** Identify the chemical engineering principles and theories that apply to the topic. **c3** Solve chemical engineering problems by applying chemical engineering fundamentals.

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A10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**d2** Acquire chemical engineering principles for professionally merge , understanding, and feedback to improve design, products for many chemical engineering industries.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Gaseous status. Practical: Chemistry Laboratory Equipment, Titrimetric Analysis.	4	-	4	**8**
2	Chemical thermodynamics. Practical: Preparation of standard solution of Na_2CO_3 (0.1N), Determination of normality of hclby using standard solution of oxalic acid.	4	-	4	**8**
3	Properties of solutions. Practical: Determination of normality of acetic acid by using standard solution of sodium hydroxide,Determination of normality of sodium carbonate by using standard solution of hcl.	4	-	4	**8**
4	Material balance in combustion processes. Practical: Standardization of potassium permanganate with oxalic acid.	2	-	2	**4**
5	Dynamic balance in physical and chemical operations. Practical: Determination of nitrites, precipitation titrations.	4	-	4	**8**
6	Kinetic chemical interactions. Practical: Preparation of 0.05N of sodium chloride.	2	-	2	**4**
7	Electrochemistry, corrosion and corrosion control. Practical: Determination of chloride ion by using Mohr method.	2	-	2	**4**

8	Fertilizers. Practical: Determining Molecule Weight by Freezing Point Depression Method.	2	-	2	**4**
9	Manufacturing and chemistry of Cement. Practical: Determining Molecule Weight by Freezing Point Depression Method.	2	-	2	**4**
10	Water processes. Practical: determination of water hardness by complex metric titration.	2	-	2	**4**
Total		**28**	**-**	**28**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Gaseous status. Practical: Chemistry Laboratory Equipment, Titrimetric Analysis.	x	x			X									X

2	Chemical thermodynamics. Practical: Preparation of standard solution of Na_2CO_3 (0.1N), Determination of normality of Hcl by using standard solution of oxalic acid.	x	x				X								X
3	Properties of solutions. Practical: Determination of normality of acetic acid by using standard solution of sodium hydroxide, Determination of normality of sodium carbonate by using standard solution of Hcl.	x	x					x							X
4	Material balance in combustion processes. Practical: Standardization of potassium permanganate with oxalic acid.	x	x				X								X

5	Dynamic balance in physical and chemical operations. Practical: Determination of nitrites, precipitation titrations.	x	x			x											x
6	Kinetic chemical interactions. Practical: Preparation of 0.05N of sodium chloride.	x	x			x											x
7	Electrochemistry, corrosion and corrosion control. Practical: Determination of chloride ion by using Mohr method.	x	x				x										x
8	Fertilizers. Practical: Determining Molecule Weight by Freezing Point Depression Method.	x	x				x										x
9	Manufacturing and chemistry of Cement. Practical: Determining Molecule Weight by Freezing Point Depression Method.	x	x			x											x

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10	Water processes. Practical: determination of water hardness by complex metric titration.	x	x			x									x

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low ,medium and high performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,c3
2	Semester work(quizzes, sheets, report)	A1,A10	c2,c3,d2
3	Practical Examination	A1,A10	c2,c3,d2
4	Final term examination	A1	a1,c2,c3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	From second week to last week
2	Student load	All weeks
3	Practical Examination	14th
4	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	2٠

2	Student load	٢٠
3	Practical Examination	١٠
4	Final term examination	٧٥
Total		**125**

8. List of References:

No.	Reference List
1	Theodore L. Brown, et al, Chemistry the Central Science, Prentice Hall Int. (Pearson International 14 edition), 2017.
2	Peter Atkins , Julio de Paula, James Keeler " Atkins' Physical Chemistry 11ed" Oxford University Press; 11th edition (2018)

9. Facilities required for teaching and learning:

No.	Facility	No.	Facility
1	Lecture classroom	4	Data show system
2	Presenter	5	Sound system
3	White board	6	Laboratory

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Gaseous status. Practical: Chemistry Laboratory Equipment, Titrimetric Analysis.	1	A1	a1
2	Chemical thermodynamics. Practical: Preparation of standard solution of Na_2CO_3 (0.1N), Determination of normality of Hcl by using standard solution of oxalic acid.	1	A1	c2, a1

3	Properties of solutions. Practical: Determination of normality of acetic acid by using standard solution of sodium hydroxide, Determination of normality of sodium carbonate by using standard solution of Hcl.	1	A1	a1
4	Material balance in combustion processes. Practical: Standardization of potassium permanganate with oxalic acid.	1	A1	a1,c2, c3
5	Dynamic balance in physical and chemical operations. Practical: Determination of nitrites, precipitation titrations.	1	A1	a1,c3
6	Kinetic chemical interactions. Practical: Preparation of 0.05N of sodium chloride.	1	A1	a1
7	Electrochemistry, corrosion and corrosion control. Practical: Determination of chloride ion by using Mohr method.	1,8	A10	d2
8	Fertilizers. Practical: Determining Molecule Weight by Freezing Point Depression Method.	8	A10	d2
9	Manufacturing and chemistry of Cement. Practical: Determining Molecule Weight by Freezing Point Depression Method.	8	A10	d2
10	Water processes. Practical: determination of water hardness by complex metric titration.	8	A10	d2

Course Coordinator: Asso.prof. Khaled Samir
Head of Department: Asso.prof. Hend Elsayed Gadow
Date of Approval: 2022

Engineering Drawing and Projection

(BAS015)

1-Basic Information:

Program Title	All programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Engineering Drawing and Projection
Course Code	BAS015
Year/Level	level 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	Lectures	Exercise	laboratory	Student's load
	1	-	4	4

2- Course Aims:

No.	Aims
1	Master a broad range of engineering drawing knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations.
2	Work in and manage a diverse team of professionals from various engineering disciplines, taking responsibility for own and team performance; and Behave professionally and adhere to engineering ethics and standards.
4	Use the techniques, skills, and current engineering tools required for engineering practice by taking full responsibility for one's own learning and development, participating in lifelong learning, and demonstrating the ability to pursue postgraduate and research studies.

3- Competencies :

Competencies	Learning Outcomes (LO'S)

A1.Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	a1 Explain the basic principles of engineering drawing.
	a2 Explain the scientific principles and theories that apply to the topic.
	b1 Using scientific concepts and tools that are relevant to the profession.
	b2 Applying engineering drawing basics that are relevant to the subject.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Techniques and skills of engineering drawing	1	-	4	4
2	Engineering operations	1	-	4	4
3	Orthogonal projection – Secondary orthogonal	2	-	8	8
4	Intersections	1	-	4	4
5	projections of simple bodies	1	-	4	4
6	rules of writing dimensions	1	-	4	4
7	Deduction of missing projections	1	-	4	4
8	Drawing of engineering sections.	1	-	4	4
9	Steel frames	2	-	8	8
10	Introduction to AutoCAD Fundamentals of engineering drafting by way of computer aided drawing (CAD) software. Basic features and capabilities of CAD software and drafting fundamentals including orthographic projection, and isometric pictorials, part dimensioning in 2 dimensional drawings.	3	-	12	12
	Total	**14**		**56**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Techniques and skills of engineering drawing	x	x												
2	Engineering operations					x									
3	Orthogonal projection – Secondary orthogonal	x				x									
4	Intersections	x	x			x									
5	Projections of simple bodies	x				x									
6	Rules of writing dimensions	x	x			x									
7	Deduction of missing projections	x	x			x									
8	Drawing of engineering sections.	x				x									
9	Steel frames	x	x			x									

10	Introduction to AutoCAD Fundamentals of engineering drafting by way of computer aided drawing (CAD) software. Basic features and capabilities of CAD software and drafting fundamentals including orthographic projection, and isometric pictorials, part dimensioning in 2 dimensional drawings.	x													x

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments each composed of low, medium, and high performance students.	Knowledge and skills transfer among different level of students.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,a2,b1
2	Semester work(quizzes, sheets, report)	A1	a1,a2
3	Final exam	A1	b1,b2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Student load	2_{nd} -7_{th} - 9_{th}
2	Periodic exams	8_{th}
3	Practical examination	14th
4	Final term exam	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	25
2	Student load	25
3	Final-term examination	75
Total		**125**

8. List of References:

No.	Reference List
1	K. V. NATARAJAN "ENGINEERING GRAPHICS Paperback" DHANALAKSHMI PUBLISHERS (2018)
2	Lakhwinder Pal Singh, Harwinder Singh "Engineering Drawing: Principles and Applications" Cambridge University Press; First edition (2019)

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Computer lab
3	Seminar
4	White board
5	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Techniques and skills of engineering drawing	1	A1	a1
2	Engineering operations	1,4	A1	a2
3	Orthogonal projection – Secondary orthogonal	1,4	A1	a1
4	Intersections	1	A1	a1
5	Projections of simple bodies	1	A1	a2
6	Rules of writing dimensions	1,2	A1	b1
7	Deduction of missing projections	1	A1	b1
8	Drawing of engineering sections.	1	A1	b2
9	Steel frames	1	A1	b2
10	Introduction to AutoCAD Fundamentals of engineering drafting by way of computer aided drawing (CAD) software. Basic features and capabilities of CAD software and drafting fundamentals including orthographic projection, and isometric pictorials, part dimensioning in 2 dimensional drawings.	1,4	A1	b1,b2

Course Coordinator: Dr / Motaz Mostafa

Head of Department: Ass.prof. Amal bahiry

Date of Approval: 2022

Introductions to Computer Systems

(BAS016)

1-Basic Information:

Program Title	All programs
Department Offering the Program	Basic Science and EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Introductions to Computer Systems
Course Code	BAS016
Year/Level	Level 0
Specialization	Major
Authorization Date of Course Specification	-

	Lectures	Exercise	laboratory	Student's load
Teaching hours	2	-	2	4

2- Course Aims:

No.	Aims
1	Master a wide range of engineering knowledge and specialized skills, as well as the ability to apply that information in real-world situations using theories and analytical thinking.
7	Use techniques, skills and modern engineering tools necessary for engineering practice;

3- Competencies:

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	c2. Identify the concepts and theories of science necessary for engineering system c3. Applying engineering basics that are relevant to the subject.
A5. Practice research techniques and methods of investigation as an inherent part of learning.	b1. Assess different ideas, views, and knowledge from a range of sources.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Computer architecture. practical: Visual Studio C# Interface Writing simple statements	**2**	**-**	2	**4**
2	Computer systems Practical: Variables, Data type	**4**	**-**	4	**8**
3	Files systems Practical: Input & Output	**2**	**-**	2	**4**
4	Computer networks Practical: Conditional Statements	**4**	**-**	4	**8**
5	Internet networks Practical:Arrays	**4**	**-**	4	**8**
6	Data systems and information technology Practical: Loop Statement (For, while & do -while)	**4**	**-**	4	**8**
7	Computer graphics – Multimedia systems Practical: Loop Statement (For, while & do -while)	**2**	**-**	2	**4**
8	Methods of solving problems and logical design for the programs and matrices. Practical: Nested loop	**4**	**-**	4	**8**
9	Engineering applications in programming using one structured programming language. Practical: Engineering Case Study.	**2**	**-**	2	**4**
Total		**28**		**28**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Computer architecture. practical: Visual Studio C# Interface Writing	x	x	x											X
	simple statements														
2	Computer systems Practical: Variables, Data type	x	x			x									x
3	Files systems Practical: Input & Output	x	x			x									x
4	Computer networks Practical: Conditional Statements	x		x											x
5	Internet networks Practical: Arrays	x	x												x

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6	Data systems and information technology Practical: Loop Statement (For, while & do -while)	x	x													x
7	Computer graphics – Multimedia systems Practical: Loop Statement (For, while & do -while)	x	x			x										x
8	Methods of solving problems and logical design for the programs and matrices. Practical: Nested loop	x	x				x									x
9	Engineering applications in programming using one structured programming language. Practical: Engineering Case Study.	x	x														x

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases

3	Asking small groups to do assignments; each composed of low, medium and high performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	c2,c3
2	Semester work(quizzes, sheets, report)	A5	b1
3	Practical Examination	A1	c2,c3
4	Final term examination	A1	c3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd ,7th,9th,13th
3	Practical Examination	14th
4	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	final examination	50
3	Practical examination	10
4	Student load	20
Total		**100**

8. List of References:

No.	Reference List
1	Darrell Hajek , Cesar Herrera "Introduction to Computers" CreateSpace Independent Publishing Platform (May 8, 2018).
2	Computing essentials timothy, O' leary and linda, 2021.

| 3 | Ludwik Czaja "Introduction to Distributed Computer systems: Principles and features" Springer; 1st ed. 2018. |

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Computer lab
3	Presenter
4	White board
5	Data show system
6	Wireless internet
7	Sound system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Computer architecture. practical: Visual Studio C# Interface Writing simple statements	1	A1	c2
2	Computer systems Practical: Variables, Data type	1	A1	c2
3	Files systems Practical: Input & Output	1	A1	c3
4	Computer networks Practical: Conditional Statements	1	A1	c3
5	Internet networks Practical: Arrays	1	A1	c3
6	Data systems and information technology Practical: Loop Statement (For, while & do -while)	1,7	A1	c3

7	Computer graphics – Multimedia systems Practical: Loop Statement (For, while & do -while)	1,7	A1	c3
8	Methods of solving problems and logical design for the programs and matrices. Practical: Nested loop	7	A5	b1
9	Engineering applications in programming using one structured programming language. Practical: Engineering Case Study.	7	A5	b1

Course Coordinator: Dr. Amira El Sonbaty

Head of Department: Ass.prof. Amal bahiry

Date of Approval: 2022

Mathematics 2
(BAS021)

1- Basic Information:

Program Title	All programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mathematics 2
Course Code	BAS021
Year/Level	Level: 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	2	-	4

2- Course Aims:

No.	Aims
1	Master a broad range of fundamental Mathematical engineering knowledge and specialized skills of Analytical geometry and Integration, as well as the ability to apply acquired knowledge of Analytical geometry and Integration in real-world situations as determine the plain areas , circular volumes, plain technical length and circular surfaces by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve mathematical engineering problems by using different methods.

3- Competencies :

Competencies	Learning Outcomes (LO'S)

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	a1. Explain the relevant mathematical engineering principles and theories in the Analytical geometry and Integration.
	b1. Use the mathematical engineering principles and theories that apply in the most fundamental problems .
	a3. Explain the basic concepts of Analytical geometry and Integration
	b3. Use the basics of integration and Geometry that are applicable to the field.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	equations of second degree and double equation for two straight lines - movement and rotation of axes - groups of unified axes circles	4	4	-	**8**
2	conical sectors (properties of conical sectors - parabola - ellipse - hyperbola)	6	6	-	**12**
3	analytical geometry in space - Cartesian coordinates - cylindrical - spherical	2	2	-	**4**
4	Plane in space - equations of surfaces in second order - rotation and movement of axes in space.	2	2	-	**4**
5	indefinite integration (basic functions - theories) - method of integration (direct - indirect)	6	6	-	**12**
6	- definite integration (definition - properties - theories) -	4	4	-	**8**
7	applications of definite integration (plain areas - circular volumes - plain technical length)	2	2	-	**4**
8	Areas - circular surfaces - numerical integration.	2	2	-	**4**
	Total	**28**	**28**	**-**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	equations of second degree and double equation for two straight lines - movement and rotation of axes - groups of unified axes circles	x	x			x									
2	conical sectors (properties of conical sectors - parabola - ellipse - hyperbola)	x	x				x								
3	analytical geometry in space - Cartesian coordinates -	x	x					x							

	cylindrical - spherical																
4	plane in space - equations of surfaces in second order - rotation and movement of axes in space.	x	x			x		x									
5	indefinite integration (basic functions - theories) - method of integration (direct - indirect)	x	x			x	x										
6	- definite integration (definition - properties - theories) -	x	x			x											
7	applications of definite integration (plain areas - circular volumes - plain technical length)	x				X	x										
8	areas - circular surfaces - numerical integration.	x	x			X											

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low ,medium and high performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:
7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,a3
2	Semester work(quizzes, sheets, report)	A1	b1,b3
3	Final term examination	A1	a1,a3,b1,b3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	Any week
2	Student load	All weeks
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	30
2	Student load	30
3	Final term examination	90
	Total	**150**

8. List of References:

No.	Reference List
1	P.N.Chatterjee "Analytical Geometry Paperback"Anu Books (2019)

2	Gerardus Blokdyk "System Integration A Complete Guide" 5STARCooks (2019).
3	Chris McMullen " Essential Calculus Skills Practice Workbook with Full Solutions" Zishka Publishing (2018).

9. Facilities required for teaching and learning:

Facility			
1	Lecture classroom	3	White board
2	Seminar	4	Data Show system

10. Matrix of Competencies and LO's of the course:

No	Topic	Aims	Competencies	LO's
1	equations of second degree and double equation for two straight lines - movement and rotation of axes - groups of unified axes circles	1	A1	a1,a3
2	conical sectors (properties of conical sectors - parabola - ellipse - hyperbola)	1	A1	a1,a3
3	analytical geometry in space - Cartesian coordinates - cylindrical - spherical	1	A1	a1,a3
4	Plane in space - equations of surfaces in second order - rotation and movement of axes in space.	1	A1	a1,a3
5	indefinite integration (basic functions - theories) - method of integration (direct - indirect)	1	A1	a1,a3
6	- definite integration (definition - properties - theories) -	1	A1	a1,a3
7	applications of definite integration (plain areas - circular volumes - plain technical length)	1	A1	b1,b3
8	Areas - circular surfaces - numerical integration.	1	A1	b1,b3

Course Coordinator: Dr / Reda Abdo
Head of Department: Ass. prof. Amal bahiry
Date of Approval: 2022

Mechanics 2
(BAS022)

1- Basic Information:

Program Title	All programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mechanics 2
Course Code	BAS022
Year/Level	Level: 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	2	-	4

2- Course Aims:

No.	Aims
1	Master a broad range of Mechanics knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.

3- Competencies :

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**a1** Define position, velocity and acceleration of particles and principles of conversation of mechanical energy **a2** Recognize methodologies of solving engineering problems including principles of work and energy **b1** Solve engineering problems to determine the velocity and position of projectile **c1** Apply knowledge of principle of work and principle of work and energy of motion and principle of conservation of mechanical energy and momentum of rigid body.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Position, Displacement, Velocity, and Acceleration of particle	4	4	-	**8**
2	Plane Motion Path of Particle	2	2	-	**4**
3	Description of plane motion using Cartesian axes	2	2	-	**4**
4	Projectiles	2	2	-	**4**
5	Relative motion between particles	2	2	-	**4**
6	Motion for particle in circular path	2	2	-	**4**
7	Newton's second law of motion	4	4	-	**8**
8	Principle of work and energy of motion	4	4	-	**8**
9	Principle of conservation of mechanical energy	2	2		**4**
10	Principle of Impulse and Momentum of rigid body	4	4		**8**
	Total	**28**	**28**	**-**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Position, Displacement, Velocity, and Acceleration of Particle	x	x			x									
2	Plane Motion path of Particle	x	x			x									
3	Description of plane Motion using Cartesian axes	x	x	x											
4	Projectiles	x	x					x							
5	Relative motion between particles	x	x			x									
6	Motion for particle in circular path	x	x			x									
7	Newton's second law of motion	x	x				x								
8	Principle of work and	x	x	x											

No.	Topic															
	energy of motion															
9	Principle of conservation of mechanical energy	x	x			x										
10	Principle of impulse and momentum of rigid body	x	x				x									

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low ,medium and high performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation methods:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,a2,b1
2	Semester work(quizzes, sheets, report)	A1	b1,c1
3	Final term examination	A1	a1,a2,b1,c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd -7th - 9th -14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	Student load	20
3	Final term examination	60
Total		**100**

8. List of References:

No.	Reference List
1	James L. Meriam, L. G. Kraige, J. N. Bolton "Engineering Mechanics Statics and Dynamics" Wiley; 9th edition, (2021).
2	S S Bhavikatti "Engineering Mechanics" New Age International Private Limited; 8th edition, (2021).
3	Hibbeler, R. C. "Engineering Mechanics: Statics and Dynamics 14/e." (2020).

9. Facilities required for teaching and learning:

	Facility		
1	Lecture classroom	3	White board
2	Seminar	4	Data Show system

10. Matrix of Competencies and LO's of the course:

No	Topic	Aims	Competencies	LO's
1	Position, Displacement, Velocity, and Acceleration of Particle	1	A1	a1
2	Plane Motion path of Particle	1	A1	a1
3	Description of plane Motion using Cartesian axes	1	A1	a2
4	Projectiles	1	A1	b1
5	Relative motion between particles	1	A1	b1
6	Motion for particle in circular path	1	A1	a2
7	Newton's second law of motion	1	A1	b1
8	Principle of work and energy of motion	1	A1	a2

9	Principle of conservation of mechanical energy	1	A1	a1
10	Principle of impulse and momentum of rigid body	1	A1	c1

Course Coordinator: Dr / Motaz Mostafa
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Physics 2

(BAS023)

1- Basic Information:

Program Title	All programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Physics 2
Course Code	BAS023
Year/Level	level 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	Lectures	Exercise	laboratory	Student's load
	2	2	2	4

2- Course Aims:

No.	Aims
1	Master a broad range of engineering physics knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.

3-Competencies:

Competencies	Learning Outcomes (LO'S)

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	a1. Define concepts and theories of physics necessary for engineering system analysis. a2. Study solving engineering problems including Einstein's quantum hypothesis, laws of reflection and refraction, interference and diffraction. a3. Define measurement devices in electrical conductivity, basic characteristics, and properties. b2. Select the appropriate solutions for engineering problems including Newton's Rings and design of optical fibers.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Basic of electricity. Practical: measurement devices in electrical conductivity.	2	2	4	4
2	Column's law and Gauss's law. Practical: sensitivity of galvanometer.	4	4	2	8
3	Capacitors and capacitance. Practical: capacitors and capacitance	2	2	2	4
4	Currents and Resistance. Practical: ohm's law - series connection &parallel connection& resistance colour code& meter bridge - voltmeter resistance.	4	4	10	8
5	Magnetic field and magnetic force. Practical: the inverse square law in magnetism.	4	4	2	8
6	The nature and propagation of light. Practical: the glass prism.	4	4	2	8
7	Optical fiber. Practical: the glass prism.	2	2	2	4
8	Introduction to Quantum theory.	2	2	0	4
9	Laser. Practical:	2	2	0	4

10	Lenses and mirrors. Practical: spherometer- mirrors and lenses.	2	2	4	4
Total		**28**	**28**	**28**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Basic of electricity. Practical: measurement devices in electrical conductivity.	x	x			x									x
2	Column's law and Gauss's law. Practical: sensitivity of galvanometer.	x	x				x								x
3	Capacitors and capacitance. Practical: capacitors and capacitance	x	x					x							x

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No.	Topic																
4	Currents and Resistance. Practical: ohm's law - series connection &parallel connection& resistance color code& meter bridge - voltmeter resistance.	X	X			X	X										X
5	Magnetic field and magnetic force. Practical: the inverse square law in magnetism.	X	X			X											X
6	The nature and propogation of light. Practical: the glass prism.	X	X				X										X
7	Optical fiber. Practical: the glass prism.	X	X					X									X
8	Introduction to Quantum theory.	X	X				X										X
9	Laser. Practical:	X	X					X									X
10	Lenses and mirrors. Practical: spherometer- mirrors and lenses.	X	X				X										X

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time

| 2 | Web communication with students | Better communication with certain cases |
| 3 | Asking small groups to do assignments each composed of low, medium and high performance students. | Knowledge and skills transfer among different levels of students |

7. Student Evaluation:
7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,a3
2	Semester work(quizzes, sheets, report)	A1	a1,a3
3	Final term examination	A1	a1,a2,b2
4	Practical exam	A1	a2,b2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	5th ,7th ,14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	30
2	final examination	75
3	Practical examination	15
4	Student load	30
Total		**150**

8. List of References:

No.	Reference List
1	Shankar, Ramamurti. Fundamentals of Physics II. Yale University Press, 2020.

2	Peter J. Williams ; Firas Mansour ; Robert L. Hawkes ; (Nuclear physicist) Javed Iqbal ; Marina Milner-Bolotin. Physics for scientists and engineers : an interactive approach, Nelson Education Ltd., Year: 2019
3	David Halliday, Robert Resnick, Jearl Walker. Fundamentals of Physics, 9th Edition, Binder Ready Version,2019
4	Serway, Raymond A., and John W. Jewett. Physics for scientists and engineers. Cengage learning, 2018.

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Laboratory
3	Presenter
4	White board
5	Data show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Basic of electricity. Practical: measurement devices in electrical conductivity.	1	A1	a1,a3
2	Column's law and Gauss's law. Practical: sensitivity of galvanometer.	1	A1	a1
3	Capacitors and capacitance. Practical: capacitors and capacitance	1	A1	a1

4	Currents and Resistance. Practical: ohm's law - series connection &parallel connection& resistance colour code& meter bridge - voltmeter resistance.	1	A1	a1,a3
5	Magnetic field and magnetic force. Practical: the inverse square law in magnetism.	1	A1	a1
6	The nature and propogation of light. Practical: the glass prism.	1	A1	a2
7	Optical fiber. Practical: the glass prism.	1	A1	b2
8	Introduction to Quantum theory.	1	A1	**a2**
9	Laser. Practical:	1	A1	b2
10	Lenses and mirrors. Practical: spherometer- mirrors and lenses.	1	A1	a2,b2

Course Coordinator: : Ass.prof .Amal Bahiry
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Production Engineering
(BAS024)

1- Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Production Engineering
Course Code	BAS024
Year/Level	Level 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	3	-	2	4

2- Course Aims:

No.	Aims
1	Master a broad range of production engineering knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations.
2	Work in and manage a diverse team of professionals from various engineering disciplines, taking responsibility for own and team performance; and Behave professionally and adhere to engineering ethics and standards.
3	Use the techniques, skills, and current engineering tools required for engineering practice by taking full responsibility for one's own learning and development, participating in lifelong learning, and demonstrating the ability to pursue postgraduate and research studies.

3- Competencies :

Competencies	Learning Outcomes (LO'S)
A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic and environmental.	c1. Apply engineering knowledge to improve products of modern tools, systems and procedure, to make the engineering process more balanced costs, benefits, safety, quality and reliability and environmental impact. c2. Apply safe systems including the use laboratory and field equipment competently
A6. Plan, supervise and monitor of production process, taking into consideration other trades requirements.	a1. Show the conventional procedures and characterization of common engineering materials and components. c2. Acquire production skills.
A5. Practice research techniques and methods of investigation as an inherent part of learning.	a1. Define technical language and report writing. b1. Assess different ideas, views, and knowledge from a range of sources. c1. Prepare technical reports d1. Search for information to engage in lifelong self-learning discipline.
A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	d1. Think creatively in solving problems of design. d2. Manage effectively for tasks, time and resources. d3. Refer to relevant literatures.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	The engineering substances and its properties Practical: engineering materials	3	-	2	4
2	Heating and cooling diagrams Practical: iron and steel production	3	-	2	4
3	Heating equilibrium diagrams Practical : heat treatment	3	-	2	4
4	Alloys - Casting operation (sand casting and the preparation of the mold) Practical: metal casting & mold for a sand casting& carpenter workshop	6	-	4	4
5	Forming processes (cold and hot forming: forging rolling – Wire drawing – Blanking and piercing - Deep drawing - The extrusion) Practical: metal forming	6	-	4	4
6	Processes of metal connections (the riveting – welding with its types sticking) Practical: metal joining process	6	-	2	4
7	Cutting machining: Lathing - Shaping – Drilling –Milling - Grinding – Work Piece fixation - Cutting tools fixation - Specifications of the operating machine) Practical: carpenter workshop	6	-	2	4
8	Methods of solving problems Practical: metal machining	3	-	2	4
9	Measuring tools (venire caliper – micrometers and its types) Practical: measurement tools	3	-	4	8
10	Production cycle	3	-	4	
	production efficiency - Industrial safety Practical training in the different workshops				8
Total		**42**	**-**	**28**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	The engineering substances and its properties Practical: engineering materials	x	x			x									x
2	Heating and cooling diagrams Practical: iron and steel production	x	x												x
3	Heating equilibrium diagrams Practical : heat treatment	x	x	x											x
4	Alloys - Casting operation (sand casting and the preparation of the mold) Practical: metal casting & mold for a sand casting&	x													x

	carpenter workshop																	
5	Forming processes (cold and hot forming: forging rolling – Wire drawing – Blanking and piercing - Deep drawing - The extrusion) Practical: metal forming	x	x															x
6	Processes of metal connections (the riveting – welding with its types sticking) Practical: metal joining process	x	x															x
7	Cutting machining: Lathing - Shaping – Drilling – Milling - Grinding – Work Piece fixation - Cutting tools fixation - Specifications of the operating machine) Practical: carpenter workshop	x	x															x

8	Methods of solving problems Practical: metal machining	x	x			x	x									x
9	Measuring tools (venire caliper – micrometers and its types) Practical: measurement tools	x	x														x
10	Production cycle production efficiency - Industrial safety Practical training in the different workshops	x	x			x											x

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments each composed of low, medium and high performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A3/A9	c1,d1, d2, d3
2	Semester work(quizzes, sheets report),	A5	a1,b1,c1,d1
3	Practical Exam	A6	a1,c2
4	Final term examination	A3/A9	c2,d1, d2, d3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	7th,9th ,14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	final examination	75
3	Practical examination	10
4	Student load	20
	Total	**125**

8. List of References:

No.	Reference List
1	Shanker, Kripa, Shankar, Ravi, Sindhwani, Rahu "Advances in Industrial and Production Engineering" 1st edition, Springer Nature Singapore Pte Ltd. (2018).
2	Jeff Hansen "Manufacturing and Production Engineering: Planning and Control" Willford Press (2018).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Production engineering workshops
2	Presenter
3	White board
4	Data show system
5	Sound system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	The engineering substances and its properties Practical: engineering materials	1	A9, A6	(d1,d2,d3), (a1,c2)
2	Heating and cooling diagrams Practical: iron and steel production	1	A5,A3	(a1,b1,c1,d1),(c1,c2)
3	Heating equilibrium diagrams Practical : heat treatment	1	A5	(a1,b1,c1,d1)
4	Alloys - Casting operation (sand casting and the preparation of the mold) Practical: metal casting & mold for a sand casting& carpenter workshop	1,3	A3	c1,c2
5	Forming processes (cold and hot forming: forging rolling – Wire drawing – Blanking and piercing - Deep drawing - The extrusion) Practical: metal forming	1,2	A3	c1,c2
6	Processes of metal connections (the riveting – welding with its types sticking) Practical: metal joining process	1,3	A3	c1,c2
7	Cutting machining: Lathing - Shaping – Drilling	1,2,3	A6	a1,c2

	–Milling - Grinding – Work Piece fixation - Cutting tools fixation - Specifications of the operating machine) Practical: carpenter workshop			
8	Methods of solving problems Practical: metal machining	1,3	A5,A9	(a1,b1,c1,d1),(d1,d2,d3)
9	Measuring tools (venire caliper – micrometers and its types) Practical: measurement tools	1,3	A3	c1
10	Production cycle production efficiency - Industrial safety Practical training in the different workshops	1,3	A6	c2

Course Coordinator: Dr. Motaz Mostafa

Head of Department: Ass.prof. Amal bahiry

Date of Approval: 2022

Introduction to Engineering and Environment
(BAS025)

1-Basic Information:

Program Title	All programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Introduction to Engineering and Environment
Course Code	BAS025
Year/Level	level 0
Specialization	Basics
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	-	-	2

2- Course Aims:

No.	Aims
3	Recognize his or her role in promoting engineering and contributing to the profession's and community's development; by appreciating the importance of the environment, both physical and natural, and working to promote sustainability concepts

3- Competencies :

Competencies	Learning Outcomes (LO'S)
A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**a2** Understand the professional ethics and impacts of engineering solutions on society and environment. **a3** Recognizes the environmental and economic impact of various industries, waste minimization, and industrial facility remediation. **b1**Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. **c1** Incorporate economic, societal, global, environmental, and risk management factors into design.

A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	a1. Describe quality assurance systems, codes of practice, and standards, as well as health and safety regulations and environmental concerns.
A10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	d1. Search for information to engage in lifelong self-learning discipline. d2. Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.
B2. Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer	d1 Engage in the recent technological changes and emerging fields relevant to chemical engineering to respond to the challenging role and responsibilities of a professional chemical engineer

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Engineering concepts: What is engineering – international classification for the engineering jobs – relation between engineering development and environment economic and social development – engineering branches – ethics of the engineering jobs.	10	-	-	10
2	Introduction to environmental science: the importance of studying environmental science – modern technology and its effect on the environment – quality of the environment and development elements	2	-	-	2
3	sources of environmental pollution and method of control (air pollution – water pollution – solid wastes pollution –noise)	4	-	-	4
4	Economics of environmental pollution control – legislations for the environment protection.	12	-	-	12
Total		**28**	**-**	**-**	**28**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Engineering concepts: What is engineering – international classification for the engineering jobs – relation between engineering development and environment economic and social development – engineering branches – ethics of the engineering jobs.	x	x								x				
2	Introduction to environmental science: the importance of studying environmental science	x	x								x				
3	Modern technology and its effect on the environment – quality of the environment and development elements	x	x	x							x				

4	Sources of environmental pollution and method of control (air pollution – water pollution – solid wastes pollution –noise) – economics of environmental pollution control – legislations for the environment protection.	**x**	**x**	**x**							**x**			

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material.	Better access any time.
2	Asking small groups to do assignments; each composed of low, medium, and high performance students.	Knowledge and skills transfer among different levels of students.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A3/A4	a2,a3,b1/a1
2	Semester work(quizzes, sheets, report)	A10	d1,d2
3	Final Term Examination	A3/B2	a2,a3,b1,c1/d1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Student load	2_{nd}, 7_{th}, 9_{th}
2	Periodic exams	8_{th}
3	Final Term Examination	15_{th}

7.3 Weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	10
2	Student load	15
3	Final-term examination	50
Total		**75**

8. List of References:

No.	Reference List
1	د. جمال صالح السلامة من الكوارث الطبيعية والمخاطر البشرية، دار الشروق، 2019
2	Raju, Fundamental of air pollution, Oxford &IBH, 2019.

9. Facilities required for teaching and learning:

No.	Facility
1	Seminar
2	Lecture Classroom
3	White Board
4	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Engineering concepts: What is engineering – international classification for the engineering jobs – relation between engineering development and environment economic and social development – engineering branches – ethics of the engineering jobs.	3	A3/B2	a2,a3,b1,c1/d1
2	Introduction to environmental science: the importance of studying environmental science	3	A4	(d1)
3	Modern technology and its effect on the environment – quality of the environment and development elements	3	A10	d1,d2

4	Sources of environmental pollution and method of control (air pollution – water pollution – solid wastes pollution –noise) – economics of environmental pollution control – legislations for the environment protection.	3	A3/A4/B2	(a2),(a1),(d1)

Course Coordinator: Dr. Ramadan Elkateb
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Technical English Language 1
(BAS026)

1-Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Technical English Language 1
Course Code	BAS026
Year/Level	level 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	-	2	3

2- Course Aims:

No.	Aims
5	Communicate effectively with a variety of audiences using a variety of forms, methods, and languages; cope with academic and professional issues in a critical and creative manner; and display leadership, business administration, and entrepreneurial abilities.

3- Competencies :

Competencies	Learning Outcomes (LO'S)
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	d1. Communicate effectively with a range of audiences using contemporary tools.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Engineering Lab. : skills in English Lesson 1 Bob's day at work & Lesson 2 Bob returns home with bad news	6	-	6	9

2	A private flat Lab. : skills in English Lesson 3 Ted's day at school	**2**	-	2	3
3	Book shelves Lab. : skills in English Lesson 4 Nicole's day at school	**2**	-	2	3
4	Bridges Lab. : skills in English Lesson 5 Ted goes out for the evening Grammar Topics	**4**	-	4	6
5	Reinforced concrete Lab. : skills in English Lesson 6 Susan stays home and bake cookies & Lesson 7 Susan hires Bob to run her own business	**4**	-	4	6
6	Surveying Lab. : skills in English Lesson 8 Ted forms a rock band & Lesson 9 Nicole for president	**4**	-	4	6
7	Hydraulic works Lab. : skills in English Lesson 10 Bob visits the village market	**4**	-	4	6
8	Soil mechanics and foundations Lab. : skills in English Grammar topics		-	2	3
Total		**28**	**-**	**28**	**42**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Engineering Lab. : skills in English Lesson 1 Bob's day at work & Lesson 2 Bob returns home with bad news	x	x		x										x
2	A private flat Lab. : skills in English Lesson 3 Ted's day at school	x	x												x
3	Book shelves Lab. : skills in English Lesson 4 Nicole's day at school	x	x												x
4	Bridges Lab. : skills in English Lesson 5 Ted goes out for the evening Grammar Topics	x	x		x										x

5	Reinforced concrete Lab. : skills in English Lesson 6 Susan stays home and bake cookies & Lesson 7 Susan hires Bob to run her own business	x	x		x												x
6	Surveying Lab. : skills in English Lesson 8 Ted forms a rock band & Lesson 9 Nicole for president	x	x															x
7	Hydraulic works Lab. : skills in English Lesson 10 Bob visits the village market	x	x															x
8	Soil mechanics and foundations Lab. : skills in English Grammar topics	x	x															x

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed of low, medium, and high performance students.	Knowledge and skills transfer among different level of students.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A8	d1
2	Semester work(quizzes, sheets, report)	A8	d1
3	Practical exam	A8	d1
4	Final term examination	A8	d1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	7th,9th
3	Practical examination	14th
4	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	Practical examination	10
3	Student load	20
4	Final-term examination	50
Total		**100**

8. List of References:

No.	Reference List
1	Gerald J. Alred, Walter E. Oliu, Charles T. Brusaw "The Handbook of Technical Writing" Bedford; 12th Ed, (2020).

| 2 | Raymond Murphy "English Grammar in Use" Cambridge University Press; 5th edition, (2019). |

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Computer lab.
3	Seminar
4	White board
5	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Engineering Lab. : skills in English Lesson 1 Bob's day at work & Lesson 2 Bob returns home with bad news	5	A8	d1
2	A private flat Lab. : skills in English Lesson 3 Ted's day at school	5	A8	d1
3	Book shelves Lab. : skills in English Lesson 4 Nicole's day at school	5	A8	d1

4	Bridges Lab. : skills in English Lesson 5 Ted goes out for the evening Grammar Topics	5	A8	d1
5	Reinforced concrete Lab. : skills in English Lesson 6 Susan stays home and bake cookies & Lesson 7 Susan hires Bob to run her own business	5	A8	d1
6	Surveying Lab. : skills in English Lesson 8 Ted forms a rock band & Lesson 9 Nicole for president	5	A8	d1
7	Hydraulic works Lab. : skills in English Lesson 10 Bob visits the village market	5	A8	d1
8	Soil mechanics and foundations Lab. : skills in English Grammar topics	5	A8	d1

Course Coordinator: Dr / Doaa El-Sherbiny
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Human Rights
(BAS027)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Technical English Language 1
Course Code	BAS027
Year/Level	level 0
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	-	-	2

2. Course Aims:

No.	Aims
1	Apply knowledge of engineering technology to express one's say and write technical reports

3. Intended Learning Outcomes (ILO'S):

Competencies	Learning Outcomes (LO'S)
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	d1. Communicate effectively with a range of audiences using contemporary tools.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	الإلمام بأهمية حقوق الإنسان والنشأة التاريخية لتلك الحقوق والمدارس الفقهية لتأصيل تلك الحقوق.	2	-	-	**2**
2	أحكام الاتفاقيات الدولية الخاصة بحقوق الإنسان ،والمنظمات الدولية العالمية والإقليمية القائمة على حماية تلك الحقوق ، وموقف الدستور المصري من حقوق الإنسان ، والحماية القانونية لها على الصعيد الوطني والصعيد الدولي ، بالإضافة إلى حقوق الإنسان في الشريعة الإسلامية	4	-	-	**4**
3	الأصول التاريخية الفلسفية لحقوق الإنسان	4	-	-	**4**
	المصادر الدولية لحقوق الإنسان (العالمية والإقليمية) المصادر الوطنية لحقوق الإنسان				
4	الأجهزة العالمية القائمة على حماية حقوق الإنسان)أجهزة الأمم المتحدة(الحماية الوطنية لحقوق الإنسان	6	-	-	**6**
5	حقوق الإنسان في الشريعة الإسلامية عرض لبعض طوائف حقوق الإنسان	12	-	-	**12**
Total		**28**	**-**	**-**	**28**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	الإلمام بأهمية حقوق الإنسان والنشأة التاريخية لتلك الحقوق والمدارس الفقهية لتأصيل تلك الحقوق	x	x		x										x

		1	2	3	4	5	6	7	8	9	10	11	12	13
2	أحكام الاتفاقيات الدولية الخاصة بحقوق الإنسان ،والمنظمات الدولية العالمية والإقليمية القائمة على حماية تلك الحقوق ، وموقف الدستور المصري من حقوق الإنسان ، والحماية القانونية لها على الصعيد الوطني والصعيد الدولي ، بالإضافة إلى حقوق الإنسان في الشريعة الإسلامية	X	X											X
3	الأصول التاريخية الفلسفية لحقوق الإنسان المصادرالدولية لحقوق الإنسان(العالمية والإقليمية) المصادرالوطنية لحقوق الإنسان	X	X											X
4	الأجهزة العالمية القائمة على حماية حقوق الإنسان (أجهزة الأمم المتحدة)الحماية الوطنية لحقوق الإنسان	X	X		X									X
5	حقوق الإنسان في الشريعة الإسلامية عرض لبعض طوائف حقوق الإنسان	X	X		X									X

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different level of students.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A8	d1
2	Semester work(quizzes, sheets, report)	A8	d1
3	Practical exam	A8	d1
4	Final term examination	A8	d1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	7th,9th
4	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	10
2	Student load	5
3	Semester work	5
4	Final-term examination	30
Total		**50**

8. List of References:

No.	Reference List
1	Jack Donnelly "International Human Rights" Routledge; 6th edition, (2020).
2	Daniel Moeckli, Sangeeta Shah, Sandesh Sivakumaran, David Harris "International Human Rights Law" Oxford University Press; 3rd edition, (2018).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Computer lab.
3	Seminar
4	White board
5	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	الإلمام بأهمية حقوق الإنسان والنشأة التاريخية لتلك الحقوق والمدارس الفقهية لتأصيل تلك الحقوق	1	A8	d1
2	أحكام الاتفاقيات الدولية الخاصة بحقوق الإنسان ،والمنظمات الدولية العالمية والإقليمية القائمة على حماية تلك الحقوق ، وموقف الدستور المصري من حقوق الإنسان ، والحماية القانونية لها على الصعيد الوطني والصعيد الدولي ، بالإضافة إلى حقوق الإنسان في الشريعة الإسلامية	1	A8	d1
3	الأصول التاريخية الفلسفية لحقوق الإنسان المصادر الدولية لحقوق الإنسان(العالمية والإقليمية) المصادر الوطنية لحقوق الإنسان	1	A8	d1
4	الأجهزة العالمية القائمة على حماية حقوق الإنسان)أجهزة الأمم المتحدة(الحماية الوطنية لحقوق الإنسان	1	A8	d1
5	حقوق الإنسان في الشريعة الإسلامية عرض لبعض طوائف حقوق الإنسان	1	A8	d1

Course Coordinator: Dr Ibrahim Taha
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Mathematics 3
(BAS111)

1- Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mathematics 3
Course Code	BAS111
Year/Level	Level: 1
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	2	-	4

2- Course Aims:

No.	Aims
1	Master a broad range of fundamental Mathematical engineering knowledge and solve of ordinary differential equations and partial differentiation applications, as well as the ability to apply acquired knowledge of ordinary differential equations and partial differentiation applications in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve multi integrations of mathematical engineering .

3- Competencies :

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics**.**	a1. Understand the relevant engineering mathematical of ordinary differential equations and applications of Partial differentiation equations.
	a2. Describe the effect of mathematical engineering principles and theories that apply in the most fundamental problems .
	a3. Define the basic concepts of ordinary differential equations and Partial differentiation equations
	b1. Applying the basics of ordinary differential equations and applications of Partial differentiation equations in engineering problems.

4. Course Contents:

No.	Topics	Lecture	laboratory	Exercise	Student's load
1	• **maximum and minimum values in more than one variable**	٤	-	**4**	٨
2	• **directional analysis the directional differential effects**	**4**	-	**4**	٨
3	• **multi integrations and its applications (the curved and the orthogonal axis)**	**4**	-	**4**	٨
4	**Gauss- Stokes theory - the endless series and function expansion – basic concepts for the convergence and divergence.**	٤	-	**4**	٨

5	• The first order (the equations which can be separated, homogeneous,	4	-	4	8
٦	exact and linear) - the ordinary differential equations from the second order and higher orders (with constant and variable coefficients	4	-	4	8
٧	systems from the ordinary differential equations– Laplace transfer and its applications in the solution of differential equations	4	-	4	8
Total		**28**	**-**	**28**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	maximum and minimum values in more than one variable	x	x			x	x								

#	Topic														
2	• directional analysis the directional differential effects	x	x			x		x							
3	multi integrations and its applications (the curved and the orthogonal axis)	x	x			x	x								
4	Gauss- Stokes theory - the endless series and function expansion – basic concepts for the convergence and divergence.	x	x			x		x							
5	• The first order (the equations which can be separated,	x	x			x	x								
6	homogeneous, exact and linear) - the ordinary differential equations from the second order and higher orders (with constant and variable coefficients	x	x			x	x								
7	systems from the ordinary differential equations– Laplace transfer and its applications in the solution of differential equations	x	x			x		x							

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases

| 3 | Asking small groups to do assignments; each composed of low ,medium and high performance students | Knowledge and skills transfer among different levels of students |

7. Student Evaluation:
7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,a2
2	Semester work(quizzes, sheets, report)	A1	a2,a3
3	Final term examination	A1	a1,a2,a3,b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd -7th - 14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	30
2	Student load	30
3	Final term examination	90
Total		**150**

8. List of References:

No.	Reference List
1	Harumi Hattori " Partial Differential Equations: Methods, Applications and Theories" WSPC; 2nd edition (2019).
2	Noboru Nakanishi, Seto Kenji "Differential Equations And Their Applications" WSPC;(2022).

3	Yuefan Deng "Lectures, Problems and Solutions for Ordinary Differential Equations" 2nd edition, WSPC; Second Edition (2017).

9. Facilities required for teaching and learning:

Facility			
1	Lecture classroom	3	White board
2	Seminar	4	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	maximum and minimum values in more than one variable	1	A1	a1,a2
2	• directional analysis the directional differential effects	1		
3	multi integrations and its applications (the curved and the orthogonal axis)	1	A1	a2
4	Gauss- Stokes theory - the endless series and function expansion – basic concepts for the convergence and divergence.	1	A1	a1,a3
5	• The first order (the equations which can be separated,	1	A1	a3
٦	homogeneous, exact and linear) - the ordinary differential equations from the second order and higher orders (with constant and variable coefficients	1	A1	a3
٧	systems from the ordinary differential equations– Laplace transfer and its applications in the solution of differential equations	1	A1	b1

Course Coordinator: Dr / Samar Madian
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Electrical Engineering Fundamentals
(BAS112)

1- Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Electrical Engineering Fundamentals
Course Code	BAS112
Year/Level	Level 1
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	3	2	-	4

2- Course Aims:

No.	Aims
4	Use the modern electrical engineering techniques, skills, and current engineering tools required for engineering practice related to electrical engineering techniques by taking full responsibility for one's own learning and developmen
7	Design a system, component, and process to meet recent technological advancements using computer systems in Electrical, Electronics and Communication engineering

3-Competencies:

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	a1. Describe the relevant mathematical principles and theories related to electrical engineering fundamentals . a2. Explain the scientific principles and theories that apply to the electrical engineering. b1. Use math ideas and theories that are applicable to the electrical engineering. b2. Use scientific concepts and theories that are relevant to electrical engineering. c1. Solve complex engineering problems related to electrical engineering by applying the concepts and the theories of mathematics c2. Identify complex engineering problems by applying the concepts and the theories of sciences, appropriate to the electrical engineering.
A2. Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	a1. Define electrical engineering principles. b3. Analyze data to interpret it b4. Evaluate components, systems, and processes are evaluated for their characteristics and performance. c1. Choose relevant mathematical and computer-based methodologies for problem modeling and analysis.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Direct Current	3	2	-	4
2	Theory of electric circuits	8	6	-	12
3	Delta and Star connections	2	1	-	2
4	Sine A.C and D.C circuits	8	5	-	10
5	Time vectors diagram	3	2	-	4
6	Electric power and power factor in A.C circuits	3	2	-	4

7	3-Phase current - Electric machines - D.C machines	6	4	-	8
8	Transformers	3	2	-	4
9	Induction and synchronous machines	3	2	-	4
10	Fractional power machine	3	2	-	4
Total		**42**	**28**	**-**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Direct Current	x	x			x									
2	Theory of electric circuits	x	x			x									
3	Delta and Star connections	x	x			x	x								
4	Sine A.C and D.C circuits	x	x			x		x							
5	Time vectors diagram	x	x			x	x								
6	Electric power and power factor in A.C circuits	x	x			x									
7	3-Phase current - Electric machines - D.C machines	x	x			x	x								
8	Transformers	x	x			x									

9	Induction and synchronous machines	x	x			x									
10	Fractional power machine	x	x			x		x							

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium and high performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,a2,b1,b2
2	Semester work(quizzes, sheets, report)	A1	b1,c2
3	Final term examination	A2	a1,b3,b4, c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd ,7th,9th,14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	30
2	Student load	30
3	final examination	90
	Total	**150**

8. List of References:

No.	Reference List
1	Fundamentals of electric circuits alexander sadiku 4th edition.2019.
2	Fundamentals of Electrical Circuit Analysis, March 2018
3	Thomas Talavage (Author), T. Arthur Terlep "Electrical Engineering Fundamentals" Independently published (2019).
4	Viktor Hacker and Christof Sumereder " Electrical Engineering: Fundamentals" De Gruyter Oldenbourg (2019).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter
3	White board
4	Data show system
5	Wireless internet
6	Sound system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Direct Current	4	A1	a1, a2,b1,b2
2	Theory of electric circuits	4	A1	a1, a2,b1,b2
3	Delta and Star connections	4	A1	a1, a2,b1,b2
4	Sine A.C and D.C circuits	4	A1	a1, a2,b1,b2
5	Time vectors diagram	4	A1	a1, a2,b1,b2
6	Electric power and power factor in A.C circuits	4	A1	a1,c2
7	3-Phase current - Electric machines - D.C machines	7	A2	a1,b3
8	Transformers	7	A2	b4,c1

9	Induction and synchronous machines	7	A2	b3,c1
10	Fractional power machine	7	A2	a1,c1

Course Coordinator: Dr. Hossam Abdelfatah
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Engineering Thermodynamics
(BAS113)

1- Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Engineering Thermodynamics
Course Code	BAS113
Year/Level	level 1
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	3	2	-	4

2- Course Aims:

No.	Aims
1	Master a broad range of engineering thermodynamics knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying thermodynamics laws to identify, diagnose, and solve engineering problems of varying complexity and variation.

3- Competencies :

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	a1. Demonstrate the thermodynamics laws that apply to the engineering problems. a2. Explain the basic principles of engineering thermodynamics. a3. Study the concepts and theories of mathematical, science necessary for engineering thermodynamic properties for different types of systems. b1. Select the appropriate solutions for engineering problems and system design, gas power cycles, vapor cycles. b2. Using scientific concepts and thermodynamics laws that are relevant to the real life.
	c1. Modify engineering knowledge and understanding to improve design, products and services, gas power cycles, vapor cycles. c2. Solve complex engineering problems by applying the concepts and the thermodynamics laws.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Fundamental concepts - Properties of a pure substance	٤	2	-	4
2	Equation of state -thermodynamic systems	٤	2	-	4
3	Work and heat - First law of thermodynamics; Applications to Systems and Control Volumes	٨	6	-	12

4	Second Law of Thermodynamics; Principle of Carnot cycles; Heat engines, Refrigerators and heat pumps	٦	4	-	8
5	Principle of the increase of entropy	٦	4	-	8
6	Applications to systems and control volumes	٨	6	-	12
7	Irreversibility and availability - Power and refrigeration cycles.	٦	4	-	8
Total		٤٢	28	-	56

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Fundamental concepts - Properties of a pure substance	x	x			x									
2	Equation of state - thermodynamic systems - Work and heat	x	x			x	x								
3	First law of thermodynamics; Applications to Systems and Control Volumes	x	x			x	x								

4	Second Law of Thermodynamics; Principle of Carnot cycles	x	x			x	x									
5	Heat engines, Refrigerators and heat pumps - Principle of the increase of entropy	x	x			x										
6	Applications to systems and control volumes - Irreversibility and availability	x	x			x										
7	Power and refrigeration cycles	x	x			x										

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material.	Better access any time
2	Web communication with students.	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium and high performance students.	Knowledge and skills transfer among different levels of students

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,a2,b1
2	Semester work(quizzes, sheets, report)	A1	c1,c2
3	Final term examination	A1	b1,a3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd ,7th,9th,14th

3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	final examination	75
3	Student load	20
4	Practical /oral	10
	Total	**125**

8. List of References:

No.	Reference List
1	P. K. Nag "Engineering Thermodynamics	6th Edition" McGraw Hill Education; Sixth edition (2017).
2	Michael J. Moran, Howard N. Shapiro, Daisie D. Boettner, Margaret B. Bailey "Fundamentals of Engineering Thermodynamics" 9th edition Wiley (2018)

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter
3	White board
4	Data show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Fundamental concepts - Properties of a pure substance	1	A1	a1,a2
2	Equation of state - thermodynamic systems - Work and heat	1	A1	a1,a2
3	First law of thermodynamics; Applications to Systems and Control Volumes	1	A1	a1,a2
4	Second Law of Thermodynamics; Principle of Carnot cycles	1	A1	b1,c1
5	Heat engines, Refrigerators and heat pumps - Principle of the increase of entropy	1	A1	b1,c1
6	Applications to systems and control volumes - Irreversibility and availability	1	A1	a3,c2
7	Power and refrigeration cycles	1	A1	b1,c1

Course Coordinator: Dr. A. E. Kabeel
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Technical English Language 2
(BAS114)

1- Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Technical English Language 2
Course Code	BAS114
Year/Level	level 1
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	-	2	3

2- Course Aims:

No.	Aims
5	Communicate effectively with a variety of audiences using a variety of forms, methods, and languages; cope with academic and professional issues in a critical and creative manner; and display leadership, business administration, and entrepreneurial abilities.

3-Competencies:

Competencies	Learning Outcomes (LO'S)
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	d1. Communicate effectively. d2. Demonstrate efficient IT capabilities.
A10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	d1. Search for information to engage in lifelong self-learning discipline. d2. Professionally merge the language skills in self learning

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Water Lab skills in English : Lesson 1 Bob drives a hard bargain& Lesson 2 Bob's big coolie order& grammar topics	**4**	-	4	6
2	Chemical and physical properties. Lab skills in English Lesson 3 Amber comes over to bake cookies & Lesson 4Amber and Ted heat up the kitchen& grammar topics	**4**	-	4	6
3	Water cycle Lab skills in English lesson 5 Nicole practices her election speech& grammar topics	**2**	-	2	3
4	Human uses Lab skills in English : Grammar topics	**4**	-	4	6
5	Heat transfer Lab skills in English lesson 6 Bob brings the cookies to the village market& lesson 7 Carol tells Bob the good news& grammar topics	**4**	-	4	6
6	Graphic language Lab skills in English : lesson 8 Every one bakes cookies & lesson 9 Nicole's close election & grammar topics	**4**	-	4	6
7	Energy Lab Skills in English lesson 10 Bob gets any angry call from Carol & Grammar topics	**4**	-	4	6
8	Automatic Control Lab Skills in English Grammar topics	**2**	-	2	3
Total		٢٨	**-**	**28**	**42**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Water Lab skills in English : Lesson 1 Bob drives a hard bargain & Lesson 2 Bob's big coolie order & grammar topics	x	x		x										x
2	Chemical and physical properties. Lab skills in English Lesson 3 Amber comes over to bake cookies & Lesson 4Amber and Ted heat up the kitchen & grammar topics	x	x		x										x

3	Water cycle Lab skills in English lesson 5 Nicole practices her election speech & grammar topics	x	x														x
4	Human uses Lab skills in English : Grammar topics	x	x														x
5	Heat transfer Lab skills in English lesson 6 Bob brings the cookies to the village market& lesson 7 Carol tells Bob the good news & grammar topics	x	x														x
6	Graphic language Lab skills in English : lesson 8 Every one bakes cookies & lesson 9 Nicole's close election & grammar topics	x	x														x
7	Energy Lab Skills in English lesson 10 Bob gets any	x	x														x

8	angry call from Carol & Grammar topics														
	Automatic Control Lab Skills in English Grammar topics	x	x												x

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed of low, medium, and high performance students.	Knowledge and skills transfer among different level of students.

7. Student Evaluation:
7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A8,A10	d1,d2
2	Semester work(quizzes, sheets, report)	A8	d1,d2
3	Practical exam	A8,A10	d1,d2
4	Final term examination	A10	d1,d2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	7th,9th
3	Practical examination	14th
4	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	Student load	20
3	Practical examination	10
4	Final term examination	50
Total		**100**

8. List of References:

No.	Reference List
1	David Bonamy "Technical English" Longman Publishing Group 2016
2	Paul J. Hamel "English for Better Jobs 1: Language for Working and Living" Create Space Independent Publishing Platform; 1st edition (2016)/
3	Mahmood Reza Atai, Alireza Zaré Alanagh, Morteza Nasiri and Reza Taherkhani "English for The Students of Engineering" 1st edition, SAMT Publication (2016).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Computer lab.
3	Seminar
4	White board
5	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's

1	Water Lab skills in English : Lesson 1 Bob drives a hard bargain & Lesson 2 Bob's big coolie order & grammar topics	5	A8	d1,d2
2	Chemical and physical properties. Lab skills in English Lesson 3 Amber comes over to bake cookies & Lesson 4Amber and Ted heat up the kitchen & grammar topics	5	A8	d1,d2
3	Water cycle Lab skills in English lesson 5 Nicole practices her election speech & grammar topics	5	A8	d1,d2
4	Human uses Lab skills in English : Grammar topics	5	A10	d2
5	Heat transfer Lab skills in English lesson 6 Bob brings the cookies to the village market& lesson 7 Carol tells Bob the good news & grammar topics	5	A10	d2
6	Graphic language Lab skills in English : lesson 8 Every one bakes cookies & lesson 9 Nicole's close election & grammar topics	5	A10	d2
7	Energy Lab Skills in English lesson 10 Bob gets any angry call from Carol & Grammar topics	5	A10	d1,d2
8	Automatic Control Lab Skills in English Grammar topics	5	A10	d1,d2

Course Coordinator: Dr. Doaa EL-Sherbiny
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Computer Programming

(BAS115)

1- Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical EngineeringDepartment
Department Responsible for the Course	Basic science and Engineering Department
Course Title	Computer Programming
Course Code	BAS115
Year/Level	Level 1
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	-	2	4

2- Course Aims:

No.	Aims
1	Apply acquired knowledge in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.

3-Competencies:

Competencies	Learning Outcomes (LO'S)
A2. Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	a1. Describe an appropriate system by applying "java "language programming. b3.Interpret data problems to identify java programs c1.Choose relevant computer-based software for modelling to analysis java programs
A5. Practice research techniques and methods of investigation as an inherent part of learning.	a1. Define technical language and report writing.

A7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	d1. Collaborate effectively within multidisciplinary team.
	d2. Work in stressful environment and within constraints.
	d3. Motivate individuals.
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	d1. Communicate effectively.
	d2. Demonstrate efficient IT capabilities.

b1. Assess different ideas, views, and knowledge from a range of sources.
c1. Prepare technical reports
d1. Search for information to engage in lifelong self-learning discipline.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Basic concepts of programming. Practical: problem analysis& Developing the programs charts& Structured programming	2	-	2	4
2	Introduction Java Applications Practical: Form of the Program& fundamentals of Java programming language and its syntax& Primitive data types, operators, variables &J option pane& scanner Classes.	4	-	4	8
3	Branching [Control Statements]. Practical: programs about (If statement, If -Else, Nested IF, Switch)	2	-	2	4
4	[Iterations] Control Statements. Practical: solved problems about (Repetition statements: for, while, dowhile& Nested loop &Continue, Break.)	4	-	4	8

5	Concepts of object Oriented programming Practical: Examples Of Classes, Inheritance Concept.	2	-	2	4
6	Methods in java. Practical: problems of (Declare method& Message passing& Method overloading)	2	-	2	4
7	Arrays and Array list Practical: Create Array& Matrix& Array List.	4	-	4	8
8	Introduction to java Applets. Practical: java Applets programs.	4	-	4	8
9	Graphical user interface (GUI). Practical: GUI exercises.				
Total		**28**	**-**	**28**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Basic concepts of programming. Practical: problem analysis & Developing the	x	x												x

	programs charts& Structured programming																
2	Introduction Java Applications Practical: Form of the Program& fundamentals of Java programming language and its syntax& Primitive data types, operators, variables & J option pane & scanner Classes.	x	x			x											x
3	Branching [Control Statements]. Practical: programs about (If statement, If -Else, Nested IF, Switch)	x	x															x
4	[Iterations] Control Statements. Practical: solved problems about (Repetition statements: for, while, do-while&	x	x			x											x

	Nested loop &Continue, Break.)															
5	Concepts of object Oriented programming Practical: Examples Of Classes, Inheritance Concept.	x	x													x
6	Methods in java. Practical: problems of (Declare method& Message passing& Method overloading)	x	x													x
7	Arrays and Array list Practical: Create Array& Matrix& Array List.	x	x													x
8	Introduction to java Applets. Practical: java Applets programs.	x	x													x

9	Graphical user interface (GUI). Practical: GUI exercises.	x	x														x

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium and high performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:
7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A2	b3,c1
2	Semester work (report, quizzes)	A5/A7	a1,b1,c1/d1,d2
3	Final term examination	A2	a1,b3
4	Practical	A8	d1,d2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	final examination	50

3	Practical examination	10
4	Student load	20
	Total	**100**

8. List of References:

No.	Reference List
1	Jeffrey L. Nyhoff, Larry R. Nyhoff "Processing: An Introduction to Programming" ebook (2017).
2	Murali Chemuturi "Computer Programming for Beginners" Taylor & Francis Group; (2018).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Computer lab.
3	Presenter
4	White board
5	Data show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Basic concepts of programming. ❖Practical: problem analysis & Developing the programs charts& Structured programming	1	A2	(a1,b3,c1)
2	Introduction Java Applications ❖Practical: Form of the Program & fundamentals of Java programming language and its syntax & Primitive	1	A2	(a1,b3,c1)

	data types, operators, variables& J option pane & scanner Classes.			
3	Branching [Control Statements]. ❖Practical: programs about (If statement, If -Else, Nested IF, Switch)	1	A5,A7	(a1,b1,c1,d1),(d1,d2,d3)
4	[Iterations] Control Statements. ❖Practical: solved problems about (Repetition statements: for, while, do-while& Nested loop &Continue, Break.)	1	A5,A7	(a1,b1,c1,d1),(d1,d2,d3)
5	Concepts of object Oriented programming ❖Practical: Examples Of Classes, Inheritance Concept.	1	A5,A7	(a1,b1,c1,d1),(d1,d2,d3)
6	Methods in java. ❖Practical: problems of (Declare method& Message passing& Method overloading) Arrays and Array list	1	A2/A8	a1/ d1,d2
7	❖Practical: Create Array& Matrix& Array List.	1	A2/A8	a1/ d1,d2
8	Introduction to java Applets. Practical: java Applets programs.	1	A5,A7	(a1,b1,c1,d1),(d1,d2,d3)
9	Graphical user interface (GUI). Practical: GUI exercises.	1	A2/A8	a1/ d1,d2

Course Coordinator: Dr. Amira Elsonbaty

Head of Department: Ass.prof. Amal bahiry

Date of Approval: 2022

Mathematics4
(BAS121)

1-Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mathematics 4
Course Code	BAS121
Year/Level	Level: 1
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	2	-	5

2-**Course Aims:**

No.	Aims
1	Master a broad range of fundamental Mathematical engineering knowledge and specialized skills of Complex Analysis and Special functions, as well as the ability to apply acquired knowledge of Complex Analysis and Special functions in real-world situations as Heat equation and Wave equation by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve mathematical engineering problems as by using complex series and Fourier series **.**

3-Competencies:

Competencies	Learning Outcomes (LO'S)

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	a1. Learn the general principles of differential equations and series and it's applications in mathematical engineering.
	a2. Describe the effect of mathematical engineering principles and theories that apply in the most fundamental problems.
	a3. Define the basic concepts of series and analytic functions.
	b1. Use the basics of Complex Analysis and Special functions to solve engineering problems.
	c1. Apply the methods of solving partial differential equations to generate solutions for heating and wave equations.

4. Course Contents:

No.	Topics	Lecture	laboratory	Exercise	Student's load
1	**Special functions**	٤	-	4	١٠
٢	**Fourier series periodic functions and Euler's laws**	4	-	4	10
٣	**Fourier's integrations – solutions of the differential**	4	-	4	10
٤	**equations by series - solving the partial differential equations using variables separation**	٤	-	4	10
٥	**Functions with complex variables – complex quantities algebra multiple values functions - the analytical functions and Koshi's theorem**	4	-	4	10
٦	**- the complex series**	4	-	4	10

٧	**Taylor and Lorant series - the zeros, unique points and the rest - the infinite series.**	**4**	**-**	**4**	**10**
Total		**28**	**-**	**٢٨**	**٧٠**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	**Special functions**	x	x			x	x	x							
2	**Fourier series periodic functions and Euler's laws**	x	x			x	x	x							
٣	**Fourier's integrations – solutions of the differential**	x	x			x	x	x							
٤	**equations by series - solving the par+tial differential equations using variables separation**	x	x			x	x	x							

No.	Topic																
٥	Functions with complex variables – complex quantities algebra + multiple values functions - the analytical functions and Koshi's theorem	x	x			x	x	x									
٦	- the complex series	x	x			x	x	x									
٧	Taylor and Lorant series - the zeros, unique points and the rest - the infinite series.	x	x			x	x	x									

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low ,medium and high performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's

1	Periodic exams	A1	a1,a2,a3,b1
2	Semester work(quizzes, sheets, report)	A1	a1,c1
3	Final term examination	A1	b1,a3,c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd -7th -14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	30
2	Student load	30
3	Final term examination	90
Total		**150**

8. List of References:

No.	Reference List
1	Brett Borden and James Luscombe "Fourier series and integrals" Morgan & Claypool Publishers (2017).
2	Chris McMullen "Essential Calculus Skills Practice Workbook with Full Solutions" Zishka Publishing (2018).

9. Facilities required for teaching and learning:

	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's

1	Special functions	1	A1	a1,b1
2	Fourier series periodic functions and Euler's laws	1	A1	a1,a2, a3
٣	Fourier's integrations – solutions of the differential	1	A1	c1
٤	equations by series - solving the partial differential equations using variables separation	1	A1	c1
٥	Functions with complex variables – complex quantities algebra multiple values functions - the analytical functions and Koshi's theorem	1	A1	b1
٦	- the complex series	1	A1	b1
٧	Taylor and Lorant series - the zeros, unique points and the rest - the infinite series.	1	A1	a3

Course Coordinator: Dr .Samar Madin

Head of Department: Ass.prof. Amal bahiry

Date of Approval: 2022

Technical Report Writing
(BAS122)

1- Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Technical Report Writing
Course Code	BAS122
Year/Level	Level 1
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	Lectures	Exercise	laboratory	Student's load
	2	-	2	4

2- Course Aims:

No.	Aims
5	Communicate effectively with a variety of audiences using a variety of forms, methods, and languages; cope with academic and professional issues in a critical and creative manner; and display leadership, business administration, and entrepreneurial abilities.

3-Competencies:

Competencies	Learning Outcomes (LO'S)

A5. Practice research techniques and methods of investigation as an inherent part of learning.	a1. Define technical language and report writing. a2.Write technical language and technical report writing through sequence steps (identify report section, present your report, cite reference and add figures and tables). b1. Assess different ideas, views, and knowledge from a range of sources. b2. Evaluate results of report models by analyzing percentage of plagiarism and rules of scientific report and rules of presentation. c1. Prepare technical reports d1. Search for information to engage in lifelong selflearning discipline.
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	d1. Communicate effectively. d2.Demonstrate efficient IT capabilities.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Introduction to technical writing. ❖ Define a report, Types of reports, Aim ❖ Common concepts: clarity of Writing, Consistency ❖ Supporting Material Language rules (voice, tense) and Style	4	-	-	8
2	Common components of a technical report ❖Organization of report sections Sections function and content	4	-	-	8

No	Topics				
3	How to write a technical report ❖ Identify layout, Determine Audience ❖ Assign reference, add non text component ❖ Mechanics of report writing. Quantitative Writing	4	-	-	8
4	Equations, Tables and Figures	2	-	-	4
5	Literature citations	2	-	-	4
6	Using word processing for Writing Report	2	-	8	4
7	Creating slides with presentation graphics programs	2	-	4	4
8	MS Excel Application and power view report command	4	-	8	8
9	Database Report using MS SQL	4	-	8	8
Total		**28**	**-**	**28**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab

1	Introduction to technical writing. ❖ Define a report, Types of reports, Aim ❖Common concepts: clarity of Writing, Consistency ❖ Supporting Material ❖ Language rules (voice, tense) and Style	x	**x**			**x**	**x**											
2	Common components of a technical report ❖ Organization of report sections ❖ Sections function and content	x	**x**			**x**	**x**											
3	How to write a technical report ❖ Identify layout, Determine Audience ❖ Assign reference, add non text component ❖ Mechanics of report writing. ❖ Quantitative Writing	x	**x**				**x**											

4	Equations, Tables and Figures	x	x			x								
5	Literature citations	x	x			x								
6	Using word processing for Writing Report	x	x			x								
7	Creating slides with presentation graphics programs	x	x			x								
8	MS Excel Application and power view report command	x	x			x								
9	Database Report using MS SQL	x	x			x								

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium and high performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:
7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A5	a1,a2
2	Semester work(quizzes, sheets, report, presentation)	A5/A8	c1,d1/d2
3	Practical Examination	A5/A8	c1/d1,d2
4	Final term examination	A5	b1,b2,a1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks

1	Periodic exams	8th
2	Student load	2nd ,7th,9th,13th
3	Practical Examination	14th
4	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation method	Marks
1	Periodic exams	20
2	final examination	50
3	Practical	10
4	Student load	20
Total		**100**

8. List of References:

No.	Reference List
1	Gerald J. Alred, Walter E. Oliu, Charles T. Brusaw "The Handbook of Technical Writing" Bedford; 12th Ed, (2020).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter
3	Computer lab.
4	White board
5	Data show system
6	Wireless internet
7	Sound system

10. Matrix of Competencies and LO's of the course:

No	Topic	Aims	Competencies	LO's
1	Introduction to technical writing	5	A5	a1
2	Common components of a technical report	5	A5	a2
3	How to write a technical report	5	A5	c1
4	Equations, Tables and Figures	5	A5	a2
5	Literature citations	5	A5	b1
6	Using word processing for Writing Report	5	A5	b2
7	Creating slides with presentation graphics programs	5	A8	d1,d2
8	MS Excel Application and power view report command	5	A8	d1,d2
9	Database Report using MS SQL	5	A5	b2

Course Coordinator: Dr / Mohamed albendary
Head of Department: Ass.prof. Amal bahiry

Date of Approval: 2022

Introductions to Information Technology

(BAS123)

1- Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Introductions to Information Technology
Course Code	BAS123
Year/Level	Level 1
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	Lectures	Exercise	laboratory	Student's load
	2	2	-	4

2- Course Aims:

No.	Aims
4	Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice web design project and building networks.

3-Competencies:

Competencies	Learning Outcomes (LO'S)
A4.Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	a2. List the engineering-related business and management principles. a3. Define contemporary engineering technologies and their applications in relation to engineering field & applications c3. Utilize modern technologies related by different engineering fields
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	d1. Communicate effectively. d2. Demonstrate efficient IT capabilities.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load

1	Introduction to information systems	4	4	-	8
2	Software and hardware used in information systems	6	6	-	12
3	Communication and Networks	4	4	-	8
4	Computer Networking	6	6	-	12
5	The internet; the foundations, Resources and uses of the internet, Emphasizing practical skills for finding, Reading and authorizing materials	4	4	-	8
6	Privacy Security and Ethics	4	4	-	4
7	Web Design using HTML Language and applications	-	-	-	4
Total		**28**	**28**	**-**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Introduction to information systems	x	x			x									
2	Software and hardware used in information systems	x	x			x									
3	Communication and Networks	x	x			x									
4	Computer Networking	x	x			x									

5	The internet; the foundations, Resources and uses of the internet, Emphasizing practical skills for finding, Reading and authorizing materials	x	x			x											
6	Privacy Security and Ethics	x	x			x											
7	Web Design using HTML Language and applications	x	x			x											

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium and high performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation methods:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A4	a2,a3,c3
2	Semester work(quizzes, sheets, report)	A8/A4	d1,d2/c3
3	Practical Examination	A8/A4	d1,d2/c3
4	Final term examination	A4	c3,a3,a2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd ,7th,9th,13th

| 3 | Practical Examination | 14th |
| 4 | Final term examination | 15th |

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	final examination	50
3	Practical examination	10
4	Student load	20
Total		**100**

8. List of References:

No.	Reference List
1	Computing essentials timothy, O' leary and linda ,2014 .

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter
3	Computer lab.
4	White board
5	Data show system
6	Wireless internet
7	Sound system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Introduction to information systems	4	A4	a2
2	Software and hardware used in information systems	4	A4	a2
3	Communication and Networks	4	A4	c3,a3
4	Computer Networking	4	A4	c3,a3
5	The internet;	4	A4	c3,a3
6	Privacy Security and Ethics	4	A4	c3,a3
7	Web Design using HTML Language and applications	4	A8	d1,d2

Course Coordinator: Dr. Amira Elsonbaty

Head of Department: Ass.prof. Amal bahiry

Date of Approval: 2022

Strength of Materials

(BAS124)

1-Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Strength of Materials
Course Code	BAS124
Year/Level	level 1
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	2	-	4

2-Course Aims:

No.	Aims
2	Work in and manage a diverse team of professionals from various engineering disciplines, taking responsibility for own and team performance; and Behave professionally and adhere to engineering ethics and standards.

3- Competencies:

Competencies	Learning Outcomes (LO'S)

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	a1.Define the concepts and theories of mathematics, necessary for engineering system analysis, general concepts of strength of material, normal stress, direct shear stress, mohr`s cycle. b1. Use math ideas and theories that are applicable to solutions for engineering problems and system design, normal stress, direct shear, stresses in beams, torsional stresses. c2. Practice the neatness and aesthetics in design to approach stresses in beams, torsional stresses, and pressure vessels c3.Apply engineering knowledge and understanding to improve design, products and/or services, normal stress, direct shear stress, stresses in beams, torsional stresses, pressure vessels,mohr`s cycle.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Simple states of stress and strain	2	2	-	4
2	Tension and compression stress	4	4	-	8
3	Shear stress in bolts	4	4	-	8
4	Bending and shearing stresses in beams	4	4	-	8
5	Torsion stresses	2	2	-	4
6	Deflection of Beams	4	4	-	8
7	Analysis of thin-walled pressure vessels	4	4	-	8
8	Analysis of plane stress	4	4	-	8
Total		**28**	**28**	**-**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Simple states of stress and strain	x	x			x									
2	Tension and compression stress	x	x			x									
3	Shear stress in bolts	x	x			x	x								
4	Bending and shearing stresses in beams	x	x			x	x								
5	Torsion stresses	x	x			x	x								
6	Deflection of Beams	x	x			x	x								
7	Analysis of thin-walled pressure vessels	x	x			x	x								
8	Analysis of plane stress	x	x			x	x								

6. Teaching and learning methods for disable students:

No	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed of low, medium, and high performance students.	Knowledge and skills transfer among different level of students.

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,b1
2	Semester work(quizzes, sheets, report)	A1	c2,c3
3	Final term examination	A1	a1,b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Student load	2_{nd}, 7_{th} , 9_{th}
2	Periodic exams	8_{th}
3	Final term examination	15_{th}

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	Student load	20
3	Final-term examination	60
Total		**100**

8. List of References:

No.	Reference list
1	T. D. Gunneswara Rao and Mudimby Andal " Strength of Materials: Fundamentals and Applications, 2018
2	Akira Todoroki " Fundamentals of Mechanics of Materials: Part 1 Stress, Strain, Torsion" 2017.

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	seminar
3	White board
4	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Simple states of stress and strain	2	A1	a1, b1
2	Tension and compression stress	2	A1	a1, b1
3	Shear stress in bolts	2	A1	a1, b1
4	Bending and shearing stresses in beams	2	A1	a1, b1
5	Torsion stresses	2	A1	a1, b1
6	Deflection of Beams	2	A1	c3
7	Analysis of thin-walled pressure vessels	2	A1	c2,c3
8	Analysis of plane stress	2	A1	c2,c3

Course Coordinator: Dr. A. E. Kabeel
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Engineering Probability and Statistics

(BAS211)

1- Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Engineering Probability and Statistics
Course Code	BAS211
Year/Level	Level: 2
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	2	-	4

2- Course Aims:

No.	Aims
1	The ability to apply probability theories and hypothesis testing in analytic critical and systemic thinking to solve engineering problems of varying complexity and variation.
6	Analyze data from the intended tests to manage resources creatively

3-Competencies :

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**a1. Describe the relevant mathematical principles and theories in the discipline.** **a2. Explain the scientific principles and theories that apply to the topic.** **b1. Use math ideas and theories that are applicable to the field.** **b3. Applying engineering basics that are relevant to the subject.**

	c2. Identify, formulate, and solve complex engineering problems by applying the concepts and the theories of sciences, appropriate to the discipline.

4. Course Contents:

No.	Topics	Lecture	laboratory	Exercise	Student's load
1	**Probability theory**	٤	-	4	٨
2	**Discrete and continuous probability distributions**	4	-	4	٨
3	**Statistics in engineering**	4	-	4	٨
4	**Descriptive Statistics Sampling distributions**	٤	-	4	٨
5	**Estimation and confidence intervals**	4	-	4	8
6	**Hypothesis testing**	4	-	4	8
7	**Simple regression**	4	-	4	8
	Total	٢٨	-	٢٨	٥٦

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	Probability theory	x	X			x	x	x							
2	Discrete and continuous probability distributions	x	X			x	x	x							
3	Statistics in engineering	x	X			x	x	x							
4	Descriptive Statistics Sampling distributions	x	X			x	x	x							
5	Estimation and confidence intervals	x	X			x	x	x							
6	Hypothesis testing	x	X			x	x	x							
7	Simple regression	x	X			x	x	x							

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time

2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low ,medium and high performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	**Periodic Exam**	**C1**	**a1, a2, b3**
2	**Semester work (quizzes, sheets, report)**	**C1**	**a1, c2**
3	**Final exam**	**C1**	**a2, b1, b3**

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd -7th - 9th -14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation Method	Marks
1	Periodic exams	20
2	Student load	20
3	Final term examination	60
Total		**100**

8. List of References:

No.	Reference List
1	Hartmut Schiefer, Felix Schiefer "Statistics for Engineers" Springer; 1st edition, (2021).

| 2 | Andrew Metcalfe, David Green,Tony Greenfield,Mayhayaudin Mansor,Andrew Smith,Jonathan Tuke"Statistics in Engineering
With Examples in MATLAB" 2nd Edition, Chapman and Hall/CRC (2019). |

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter
3	White board
4	Data show system
5	Sound system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	**Probability theory**	1	**C1**	**a1**
2	**Discrete and continuous probability distributions**	6	**C1**	**a2**
3	**Statistics in engineering**	1	**C1**	**b3**
4	**Descriptive Statistics Sampling distributions**	1	**C1**	**b1**
5	**Estimation and confidence intervals**	1	**C1**	**c2**
6	**Hypothesis testing**	6	**C1**	**c2**
7	**Simple regression**	6	**C1**	**c2**

Course Coordinator: Dr. Samar Madin

Head of Department: Ass.prof. Amal bahiry

Date of Approval: 2022

Fluid Mechanics
(BAS212)

1-Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Fluid Mechanics
Course Code	BAS212
Year/Level	level 2
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	1	1	4

2- Course Aims:

No.	Aims
1	Master a broad range of Fluid Mechanics knowledge and specialized skills, as well as the ability to understand and apply physical concept knowledge in real-world situations by applying fluid mechanics basic theories. Also, to Apply knowledge of science and engineering concepts to study fluid properties, fluid statics and fluid dynamics and to abstract course knowledge that give him or her, the ability to think, identify, diagnose, and solve engineering problems of varying complexity and variation in real world as an engineer.
4	Use the techniques, skills, and current engineering tools required for engineering practice of fluid mechanics by taking full responsibility for one's own learning and development, participating in lifelong learning, and demonstrating the ability to pursue postgraduate and research studies.
8	Consider the impact of fluid mechanics study in real world, and its strong relation with environment and almost of all the technology fields upgrades.

3- Competencies

Competencies	Learning Outcomes (LO'S)

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	a1. Define concepts of energy, momentum equations and dimensional analysis (laminar and turbulent flow).
	a2. Explain the basic principles of fluid mechanics engineering.
	b1. Analyze various ideas and views for different forces on immersed bodies.
	b2. Using scientific concepts and theories that are relevant to the fluid mechanics.
	b3. Applying engineering basics that are relevant to the subject.
A2. Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	a1. Apply knowledge of Bernoulli and continuity equations for experiments of Venturi meter and losses in pipes. a2. Analyze data in laboratory and in pipes and pumps field.
	b1. Conduct basic experiments to learn about the basic characteristics and features of fluids for statics and dynamics branches.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Fluid properties, fluid statics, kinematics	2	2	2	6
2	Fluid dynamics including energy and Momentum equations	4	2	2	8
3	Dimensional analysis, Laminar flow, Turbulent flow and its applications	2	2	2	6
4	Forces on immersed bodies, Introduction to compressible flow	4	2	2	8
5	Applications to filtration and fluidization	4	2	2	8
6	Laboratory course in Fluid Mechanics includes experiments on venture-meter, friction losses in pipes	6	2	2	10

7	Center of pressure, Flow measuring apparatus, multi-pump test (Pump characteristics) and losses in piping systems	6	2	2	10
Total		**28**	**14**	**14**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Fluid properties, fluid statics, kinematics	x	x			x									
2	Fluid dynamics including energy and Momentum equations	x	x			x	x								
3	Dimensional analysis, Laminar flow, Turbulent flow and its applications	x	x			x		x							
4	Forces on immersed bodies, Introduction to	x	x			x									

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No.	Topic													
	compressible flow													
5	Applications to filtration and fluidization	x	x			x						x		
6	Laboratory course in Fluid Mechanics includes experiments on venture-meter, friction losses in pipes	x	x											x
7	Center of pressure, Flow measuring apparatus, multi-pump test (Pump characteristics) and losses in piping systems	x	x			x								

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium and high performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A1	a1,a2,b1,b2,b3
2	Semester work(quizzes, sheets, report)	A1	a1,b2

| 3 | Final term examination | A1 ,A2 | a1,a2,b1,b2,b3 |

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd ,7th,9th,14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	Evaluation method	Marks
1	Periodic exams	30
2	final examination	75
3	Practical examination	15
4	Student load	30
Total		**150**

8. List of References:

No.	Reference List
1	Gerhart, Philip M., Andrew L. Gerhart, and John I. Hochstein. Munson, Young and Okiishi's Fundamentals of Fluid Mechanics. John Wiley & Sons, 2021.
2	CENGEL "FLUID MECHANICS: FUNDAMENTALS AND APPLICATION" MC GRAW HILL INDIA; 4th edition, (2019).
3	Young, D. F., Munson, B. R., Okiishi, T. H., & Huebsch, W. W. (2021). A brief introduction to fluid mechanics. John Wiley & Sons.

9. Facilities required for teaching and learning:

Facility	
1	Lecture classroom
2	Seminar
3	Computer lab.
4	White board
5	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Fluid properties, fluid statics, kinematics	1	A1	a1,a2
2	Fluid Dynamics including Energy and Momentum equations	1	A1	a1
3	Dimensional analysis, laminar flow, turbulent flow and its applications	1	A1	a1
4	forces on immersed bodies, introduction to compressible flow	4	A1	b1
5	Applications to filtration and fluidization	8	A1	b2,b3
6	Laboratory course in Fluid Mechanics includes experiments on venture-meter, friction losses in pipes	4,8	A2	a2
7	Center of pressure, flow measuring apparatus, multi-pump test (Pump characteristics) and losses in piping systems	4,8	A2	a1,b1

Course Coordinator: Dr / Motaz Mostafa

Head of Department: Ass.prof. Amal bahiry

Date of Approval: 2022

Engineering Economy

(BAS213)

1-Basic Information:

Program Title	Chemical engineering Program
Department Offering the Program	Chemical engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Engineering Economy
Course Code	BAS213
Year/Level	Level 2
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	1	-	3

2-Course Aims:

No.	Aims
2	Work in and manage a diverse team of professionals from various engineering disciplines, taking responsibility for own and team performance; and Behave professionally and adhere to engineering ethics and standards.

3-Competencies:

Competencies	Learning Outcomes (LO'S)
A3.Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	a1. List the economic concepts related to characteristics in engineering analysis to improve the engineering process. a2. Recognize business and management principles relevant to engineering for replacement and depreciation of equipment to reduce the cost of operations. b1. Combine different ideas, views, and knowledge from a range of sources to evaluate the characteristics of project economic c1. Assess economic, societal, and environmental dimensions and risk management in engineering design.

A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	a2.List the engineering-related economy. b1.Innovate economy methodical approaches when dealing with new and advancing technology. c2Use fundamental economy organizational abilities.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Basic concepts of engineering economy	4	2	-	6
2	Break even analysis	4	2	-	6
3	Time value of money	6	3	-	9
4	Depreciation and replacement analysis	4	2	-	6
5	Selection between alternatives	6	3	-	9
6	Productivity	4	2	-	6
Total		**28**	**14**	**-**	**42**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Basic concepts of engineering economy	x	x			x									
2	Break even analysis	x	x			x	x								

3	Time value of money	x	x			x		x							
4	Depreciation and replacement analysis	x	x			x	x								
5	Selection between alternatives	x	x			x		x							
6	Productivity	x	x			x	x								

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed of low, medium, and high performance students.	Knowledge and skills transfer among different level of students.

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A3	a1,a2,b1
2	Semester work(quizzes, sheets, report)	A3	b1,c1
3	Final term examination	A3,A4	a1,b1,c2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Student load	$6_{th}, 11_{th}$
2	Periodic exams	8_{th}
3	Final term examination	15_{th}

7.3 weighting of Evaluation:

No.	Evaluation method	Marks
1	Periodic exams	20
2	Student load	20
3	Final-term examination	60

Total	100

8. List of References:

No.	Reference List
1	Don Newnan, Ted Eschenbach, Jerome Lavelle, Neal Lewis "Engineering Economic Analysis" Oxford University Press; 14th edition, (2019).
2	Leland Blank, Anthony Tarquin "Engineering Economy" McGraw Hill; 8th edition, (2017).
3	William Sullivan, Elin Wicks, C Koelling "Engineering Economy" Pearson; 17th edition, (2018).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	seminar
3	White board
4	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	Basic concepts of engineering economy	2	A3	a1
2	Break even analysis	2	A3	a1
3	Time value of money	2	A3	a2
4	Depreciation and replacement analysis	2	A4	a2
5	Selection between alternatives	2	A4	b1,c1
6	Productivity	2	A4	c2

Course Coordinator: Dr. Hany Hashish
Head of Department: Ass.prof. Amal bahiry
Date of Approval: 2022

Heritage of Egyptian Literature

BAS214

1-Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical Engineering Department
Department Responsible for the Course	Chemical Engineering Department
Course Title	Heritage of Egyptian Literature
Course Code	BAS214
Year/Level	Level 2
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	Lectures	Exercise	laboratory	Student's load
	2	-	-	3

2-Course Aims:

No.	Aims
5	Communicate effectively with a variety of audiences using a variety of forms, methods, and languages; cope with academic and professional issues in a critical and creative manner.

3-Competencies:

Competencies	Learning Outcomes (LO'S)
A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations**.**	d1. Think creatively in solving problems of design.

d3. Refer to relevant literatures. |

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	تعريف الطالب بالتميز الإقليمي لمصر في العصور القديمة والوسطى والحديثة وأثر عبقرية المكان على الفكر والوعى المصري وتجلياته في التراث الأدبي شعرا ونثرا من خلال الدرس التاريخي والنصي للأدب المصري في مراحله المختلفة.	4	-	-	6

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2	مصر وتراثها الأدبي من منظور حضاري وإبداعي - المكتبة التراثية المصرية من منظور تاريخي متجدد - دراسة مفهوم وضعية العصور الوسطى في مصر والفرق بينها وبين العصور الوسطى في أوروبا - التراث الجغرافي المصري وأدب الرحلة في كتابات مصرية	6	-	-	9
3	التأليف الموسوعي في مصر والصياغة الأدبية في فن الموسوعات – الظواهر الأدبية الغالبة على الأدب المصري - مناهج دراسة التراث الأدبي المصري ودلالاته – مدارس التأليف والإبداع في تاريخ الفكر المصري	8	-	-	12
4	- مجالات الإبداع في الشعر المصري)الطبيعة المصرية - أدب الحروب الموضوعات الجديدة والبيئة المصرية(- مدارس الكتابة الفنية على المستوى الرسمي وغيرها	6	-	-	9
5	- تتبع التطبيق على النص والتحليل من خلال أبرز شعراء وكتاب التراث المصري من أمثال ابن نباته المصري وابن سناءالملك وصولا إلى أدوار الدكتور محمد كامل حسين والأستاذ أمين الخولى والدكتور جمال حمدان في تناول التراث الأدبي المصري بالتحليل والدراسة المنهجية حول عبقرية المكان.	4	-	-	6
Total		**28**	**-**	**-**	**42**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab

1	تعريف الطالب بالتميز الإقليمي لمصر في العصور القديمة والوسطى والحديثة وأثر عبقرية المكان على الفكر والوعى المصري وتجلياته في التراث الأدبي شعرا ونثرا من خلال الدرس التاريخي والنصي للأدب المصري في مراحله المختلفة.	X	X			X											
2	مصر وتراثها الأدبي من منظور حضاري وإبداعي - المكتبة التراثية المصرية من منظور تاريخي متجدد - دراسة مفهوم وضعية العصور الوسطى في مصر والفرق بينها وبين العصور الوسطى في أوروبا - التراث الجغرافي المصري وأدب الرحلة في كتابات مصرية	X	X			X											
3	التأليف الموسوعي في مصر والصياغة الأدبية في فن الموسوعات — الظواهرالأدبيةالغالبة على الأدب المصري - مناهج دراسة التراث الأدبي المصري ودلالاته — مدارس التأليف والإبداع في تاريخ الفكر المصري	X	X	X		X					X						
4	- مجالات الإبداع في الشعر المصري)الطبيعة المصرية - أدب الحروب الموضوعات الجديدة والبيئة المصرية(- مدارس الكتابة الفنية على المستوى الرسمي وغيرها	X	X			X					X						

| 5 | ـ تتبع التطبيق على النص والتحليل من خلال أبرز شعراء وكتاب التراث المصري من أمثال ابن نباته المصري وابن سناءالملك وصولا إلى أدوار الدكتور محمد كامل حسين والأستاذ أمين الخولى والدكتور جمال حمدان في تناول التراث الأدبي المصري بالتحليل والدراسة المنهجية حول عبقرية المكان. | x | x | | x | x | | | | | x | | | |

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low ,medium and high performance students	Knowledge and skills transfer among different levels of students

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A9	d1,d3
2	Semester work(sheets, quizzes, presentation)	A9	d1,d3
3	Final term examination	A9	d1,d3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8th
2	Student load	2nd -7th - 9th-14th
3	Final term examination	15th

7.3 weighting of Evaluation:

No.	evaluation method	Marks

1	Periodic exams	10
2	Student load	10
3	Final term examination	30
Total		**50**

8. List of References:

No.	Reference List
1	Ayman Osman "موسوعة تراث مصري" Dawen Publishers; 2nd edition, (2019).

9. Facilities required for teaching and learning:

No.	Facility	No.	Facility
1	Lecture classroom	4	Data show system
2	Presenter	5	Sound system
3	White board		

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	تعريف الطالب بالتميز الإقليمي لمصر في العصور القديمة والوسطى والحديثة وأثر عبقرية المكان على الفكر والوعى المصري وتجلياته في التراث الأدبي شعرا ونثرا من خلال الدرس التاريخي والنصي للأدب المصري في مراحله المختلفة.	1	A9	d1,d3
2	مصر وتراثها الأدبي من منظور حضاري وإبداعي ـ المكتبة التراثية المصرية من منظور تاريخي متجدد ـ دراسة مفهوم وضعية العصور الوسطى في مصر والفرق بينها وبين العصور الوسطى في أوروبا ـ التراث الجغرافي المصري وأدب الرحلة في كتابات مصرية	1	A9	d1,d3

3	التأليف الموسوعي في مصر والصياغة الأدبية فن الموسوعات – الظواهرالأدبية الغالبة على الأدب المصري ـ مناهج دراسة التراث الأدبي المصري ودلالاته – مدارس التأليف والإبداع في تاريخ الفكر المصري	1	A9	d1,d3
4	ـ مجالات الإبداع في الشعر المصري (الطبيعة المصرية ـ أدب الحروب الموضوعات الجديدة والبيئة المصرية(ـ مدارس الكتابة الفنية على المستوى الرسمي وغيرها	1	A9	d1,d3
5	ـ تتبع التطبيق على النص والتحليل من خلال أبرز شعراء وكتاب التراث المصري من أمثال ابن نباته المصري وابن سناءالملك وصولا إلى أدوار الدكتور محمد كامل حسين والأستاذ أمين الخولى والدكتور جمال حمدان في تناول التراث الأدبي المصري بالتحليل والدراسة المنهجية حول عبقرية المكان.	1	A9	d1,d3

Course Coordinator: Dr. Mohamed elbindary
Head of Department: Ass.Dr. Hend ElsayedGadow
Date of Approval: 2022

Numerical Methods in Engineering

BAS221

1-Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Numerical Methods in Engineering
Course Code	BAS221
Year/Level	Level: 2
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	Lectures	Exercise	laboratory	Student's load
	2	2	-	4

2-Course Aims:

No.	Aims
1	Master a broad range of engineering knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying numerical theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.

3-Competencies:

Competencies	Learning Outcomes (LO'S)
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**a1. Describe the relevant mathematical principles and theories in the discipline.** **a2. Explain the scientific principles and theories that apply to the topic.** **b1. Using math ideas and theories that are applicable to the field.** **b2. Using scientific concepts and theories that are relevant to the profession.**

| | c1. solve complex engineering problems by - applying the concepts and the theories of mathematics |
| | c2. Identify complex engineering problems by applying the concepts and the theories of sciences, appropriate to the discipline. |

4. Course Contents:

No.	Topics	Lecture	laboratory	Exercise	Student's load
1	**Numerical solution of linear**	**4**	**-**	**4**	**8**
2	**Numerical solution of nonlinear systems**	**4**	**-**	**4**	**8**
3	**Numerical differentiation and integration**	**4**	**-**	**4**	**8**
4	**Curve fitting**	**4**	**-**	**4**	**8**
5	**Interpolation**	**4**	**-**	**4**	**8**
6	**Numerical solution of initial value problems**	**4**	**-**	**4**	**8**
7	**Boundary and Eigen value problems**	**4**	**-**	**4**	**8**
	Total	**28**	**-**	**28**	**56**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	Numerical solution of linear	x	X			x	x	x							
2	Numerical solution of nonlinear systems	x	X			x	x	x							
3	Numerical differentiation and integration	x	X			x	x	x							
4	Curve fitting	x	X			x	x	x							
5	Interpolation	x	X			x	x	x							
6	Numerical solution of initial value problems	x	X			x	x	x							
7	Boundary and Eigen value problems	x	X			x	x	x							

6. **Teaching and learning methods for disable students:**

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low ,medium and high performance students	Knowledge and skills transfer among different levels of students

7. **Student Evaluation:**

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	**Midterm examination**	**C1**	**a1, a2, b1**
2	**Semester work (quizzes, sheets, report)**	**C1**	**a2, c1, c2**
3	**Final term examination**	**C1**	**b1, b2**

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Periodic exams	8_{th}
2	Student load	2_{nd} -7_{th} - 9_{th} -14_{th}
3	Final term examination	15th

7.3 weighting of Evaluation :

No.	Evaluation Method	Marks
1	Periodic exams	20
2	Student load	20
3	Final term examination	60
	Total	**100**

8. **List of References:**

No.	Reference List
1	Steven Chapra, Raymond Canale "Numerical Methods for Engineers" McGraw Hill; 8th edition, (2020).

2	B. S. Grewal "Numerical Methods in Engineering and Science" Mercury Learning and Information (2018).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter
3	White board
4	Data show system
5	Sound system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	**Numerical solution of linear**	**1**	**C1**	**a1**
2	**Numerical solution of nonlinear systems**	**1**	**C1**	**a2**
	Numerical differentiation and integration	**1**	**C1**	**a2**
3	**Curve fitting**	**1**	**C1**	**b1**
	Interpolation	**1**	**C1**	**b1**
4	**Numerical solution of initial value problems**	**1**	**C1**	**b2**
5	**Boundary and eigen value problems**	**1**	**C1**	**c1, c2**

Course Coordinator: Dr. Samar Madin

Head of Department: Ass.prof. Amal bahiry

Date of Approval: 2022

Environmental Management

(BAS311)

1-Basic Information:

Program Title	Chemical Engineering Program
Department Offering the Program	Chemical Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Environmental Management
Course Code	BAS311
Year/Level	level 3
Specialization	Major
Authorization Date of Course Specification	-

Teaching hours	**Lectures**	**Exercise**	**laboratory**	**Student's load**
	2	1	-	3

2-Course Aims:

No.	Aims
2	Work in and manage a diverse team of professionals from various engineering disciplines, taking responsibility for own and team performance; and Behave professionally and adhere to engineering ethics and standards.
3	Recognize his or her role in promoting engineering and contributing to the profession's and community's development; by appreciating the importance of the environment, both physical and natural, and working to promote sustainability concepts;

3- Competencies:

Competencies	Learning Outcomes (LO'S)
A3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**a2** Understand the professional ethics and impacts of engineering solutions on society and environment. **a3** Recognizes the environmental and economic impact of various industries, waste minimization, and industrial facility remediation. **b1**. Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. **c1**. Incorporate economic, societal, global, environmental, and risk management factors into design.
A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**a1**. Describe quality assurance systems, codes of practice, and standards, as well as health and safety regulations and environmental concerns. **c1**. Apply safe systems at work by taking the necessary precautions to manage hazards. **c3**. Utilize modern technologies.
A10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**d1**. Search for information to engage in lifelong self-learning discipline.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	The importance of studying environmental science – modern technology and its effect on the environment	8	2	-	12
2	quality of the environment and development elements	4	3	-	6
3	sources of environmental pollution and method of control (air pollution – water pollution)	8	6	-	12

4	Solid wastes pollution – noise) – economics of environmental pollution control – legislations for the environment protection.	8	3	-	12
Total		**28**	**14**	**-**	**42**

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	The importance of studying environmental science – modern technology and its effect on the environment	x	x			x					x				
2	quality of the environment and development elements	x	x	x		x					x				

3	sources of environmental pollution and method of control (air pollution – water pollution)	x	x			x		x			x					
4	Solid wastes pollution – noise) – economics of environmental pollution control – legislations for the environment protection.	x	x	x		x		x			x					

6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material.	Better access any time.
2	Asking small groups to do assignments; each composed of low, medium, and high performance students.	Knowledge and skills transfer among different levels of students.

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Periodic exams	A3,A4	a2,b1 ,a1, c1
2	Semester work(report, quizzes, presentation)	A10,A4	d1,c1,c3
3	Final Term Examination	A3,A4,A10	a3,a1,d1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Student load	2nd, 7th , 9th

2	Periodic exams	8th
3	Final Term Examination	15th

7.3 weighting of Evaluation:

No.	evaluation method	Marks
1	Periodic exams	20
2	Student load	20
3	Final-term examination	60
Total		**100**

8. List of References:

No.	Reference List
1	David A. Anderson "Environmental Economics and Natural Resource Management" Routledge; 5th edition, (2019).
2	John Morelli "Voluntary Environmental Management" CRC Press; 1st edition, (2020).
3	Marc Lame "Environmental Management" Cambridge University Press; , (2022).
4	Tracy Dathe, René Dathe, Isabel Dathe, Marc Helmold "Corporate Social Responsibility (CSR), Sustainability and Environmental Social Governance (ESG)" Springer ; , (2022).
5	International Organization for Standardization "ISO 14001:2015 - Environmental Management Systems - A practical guide for SMEs" Multiple. Distributed through American National Standards Institute (ANSI); , (2017).

9. Facilities required for teaching and learning:

No.	Facility
1	Seminar
2	Lecture Classroom
3	White Board
4	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Topic	Aims	Competencies	LO's
1	The importance of studying environmental science – modern technology and its effect on the environment	2,3	A10,A3	d1,a2

2	Quality of the environment and development elements	2,3	A10,A3,A4	d1,b1,a1
3	Sources of environmental pollution and method of control (air pollution – water pollution	2,3	A3,A4	a3,c1
4	Solid wastes pollution – noise) – economics of environmental pollution control – legislations for the environment protection.	2,3	A3,A4	c1,c3

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