Course Specification
100 G: General Geology

A- Affiliation

Relevant program: **B.Sc. in Geology**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **First level**

B - Basic information

Title: Physical Geology	**Code:100G**	**Year/Level:** First level
Teaching Hours:	**Lectures:**1	**Tutorial:** 0
	Practical: 2	**Total:**3 h/week

C - Professional information

1 – Course Learning Objectives:

This course aims to enable the students to understand the fundamentals of Physical and Historical Geology and investigate devices and tools used in physical Geology. The student by the end of the course should be able to analyze and evaluate facts and problems in Geology, Earth evolution, and earth materials.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should be able to:

a.1. recognize the fundamentals of geological process,
a.2. identify the physical geology problem and ways to solve it,
a.3. characterize each type of internal and external process,
a.4. demonstrate the basics of the earth's crust components, geological work for water, and earthquakes and volcanoes.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. interpret the different reasons behind facts in Physical Geology,
b2. decide which physical feature is responsible for the different geological structures,
b3. analyze the various types of data related to surface and underground water,
b4. investigate the distribution of earthquakes, volcanoes, and mineral resources about plate motion.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. analyze physical phenomena and Earth processes,
c2. use the fundamentals and principles to better be understanding the features of surface water, groundwater, oceans, and seas, as well as building mountains,
c3. draw interpretations of Earth’s structure, components, and processes.

d - General skills:

On successful completion of the course, the student should be able to:

d1. review available literature and new state-of-the-art techniques,
d2. self-evaluate and report preparation,
d3. apply knoweldge and training in physical Geology problems.
d3. work in a group and manage time and effort.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction and history of the science	1	0	2
2. Earth structure	1	0	2
3. Earth Evolution	1	0	2
4. Earth materials	1	0	2
5. Rock cycle and geotectonics	1	0	2
6. Geological structures	1	0	2
7. Internal processes	1	0	2
8. Earthquakes	1	0	2
9. Volcanoes	1	0	2
10. External processes	1	0	2
11. Weathering processes	1	0	2
12. Surface water and ground water	1	0	2
13. Geologic column and geologic time scale	1	0	2
14. Geology and Man	1	0	2
Total hours	**14**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & understanding	a1	recognize the fundamentals of geological process,	x	x	x	0	0	x
	a2	identify the physical Geology problem and ways to solve,	x	x	0	x	0	0
	a3	characterize each type of the internal and external processes,	x	0	x	0	x	x
	a4	demonstrate the basics of the earth's crust components, geological work for water, and earthquakes and volcanoes.	x	x	0	0	x	x
Int elle ctu	b1	interpret the different reasons behind facts in physical processes on Earth,	x	x	0	0	x	0

	b2	decide which physical feature is responsible for the different geological structures,	x	0	0	x	x	x
	b3	analyze the various types of data related to surface and underground water,	x	x	0	x	x	0
	b4	investigate the distribution of earthquakes, volcanoes, and mineral resources in relation to plate motion.	x	0	x	0	0	x
Practical and professional skills	c1	analyze physical phenomena and Earth processes,	x	0	x	0	X	x
	c2	use the fundamentals and principals for better understand the features of surface water, underground water, and oceans and seas, as well as building mountains,	x	0	x	0	X	x
	c3	draw interpretations of Earth's structure, components, and processes.	x	0	0	0	x	x
General Skills	d1	review available literature and new state-of-the-art techniques,	x	x	x	0	0	x
	d2	self-evaluate and report preparation,	x	x	x	0	0	x
	d3	apply knowledge and training in physical Geology problems,	x	x	x	o	x	x
	d4	work in a group and manage time and effort.	x	x	o	o	o	x

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities, and quizzes to assess the student's progress and personal attitude,
5.2. Assignments to assess the student's independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exams to evaluate students and promote other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a3, b1, and b2	Fifth week	6 %
Mid-Term Exam	a1, a2, b1, b2, and b3	Seventh week	8 %
Practical Exam	c1, c2, b2, and c3	Thirteenth week	24 %
Oral exam	a2, a3, a4, b2, b3, c1, c2	Thirteenth week	14 %
Final written exam	a1, a2, a3, b2, b4, c2, c3, d3.	Fourteenth week	48 %
Total			100 %

-Course Matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and History of the Science	x						x						x			
Earth structure		x				x					x					x
Earth Evolution				x												

Earth materials			x													
Rock cycle and geotectonics				x										x		
Geological structures						x				x						
Internal processes		x						x						x		
Earthquakes			x										x			
Volcanoes		x							x						x	
External processes	x						x					x		x		
Weathering processes			x			x							x			
Surface water and ground water		x								x					x	
Oceans and Seas		x														x
Perspectives in Geology and related sciences			x											x		

6- List of references:

6-1 Course notes
Lecture notes prepared by the course instructor(s) and approved by the department council, PowerPoint presentations uploaded to the university website.

6-2 Required books.
None
6-3 Recommended books

Geology: Made Simple. William H. Matthews
Advisory editor Eric A. Jarman, BSc. Made Simple Books
HEINEMANN: London. © 1983 by William Heinemann Ltd
First edition, September 1970
Revised reprint, November 1974
Second edition, November 1977
Reprinted, March 1980
Reprinted, March 1983
Earth: An Introduction to Physical Geology, Books a la Carte Edition (11th Edition),
by E. J. Tarbuck , F. K. Lutgens, , D. G. Tasa
Prentice Hall; 11 edition (January 28, 2013)

6-4 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:
Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinators: Prof. Emad Sallam
Prof. Hassan El-Shiekh

Head of the Department:	Prof. Gamal El Qot
Date:	Approved on 9/12/2015 (meeting number 390), updated on 10/1/2018 (meeting number 419), updated March 2023

Course Specification
101 G: General Geology

A. Affiliation

Relevant program: **B.Sc. in Geology**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **First level**

B . Basic information

Title: General Geology	**Code:101G**	**Year/level:** First level
Teaching Hours:	**Lectures:**2	**Tutorial:** 0
	Practical: 2	**Total:**4 h/week

C . Professional information

1. Course Learning Objectives:

The objective of this course is to enable the students to understand the fundamentals of crystallography, minerals and rocks and to investigate techniques used in these sciences. The student by the end of the course should be able to analyze and evaluate facts and problems in minerals, crystals and Earth evolution.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should be able to:

- **a1.** recognize the fundamentals of Histrocial Geology,
- **a2.** state the cases of solid material, crystal forms and systems,
- **a3.** characterize each of the physical proporeties of minerals,
- **a4.** identify the basics of mineral classification and rock dating techniques.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

- **b1.** interpret the past as intrapolation of the present using fossils,
- **b2.** explain the methods of rock and material age determination,
- **b3.** describe the different crystal systems and forms,
- **b4.** examin the various types of data related to minerals and their characterstics and formation,
- **b5.** explore the different mineral categories and their origin.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

- **c1.** study the different theories in Historical Geology,
- **c2.** identify the diffent types of fossils and casts,
- **c3.** apply the pricicpals for classification of crystals and minerals,
- **c4.** depict interpretations of physical properties for mineral identification.

d. General skills:

On successful completion of the course, the student should be able to:

- **d1.** review available literature on historical Geology and related branches,
- **d2.** combine diffenent data for problem solving,
- **d3.** use knoweldge and training for identification of earth materials,
- **d4.** work in a group and collaborate with peers.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction and histroy of the science	2		2
2. Origin of the Earth	2		2
3. Principles of Hsitorical Geology	2		2
4. Methods of rock age dating and geologic time scale	2		2
5. Cases of solid material	2		2
6. Crystal systems	2		2
7. Crystal symmetry and forms	2		2
8. Example crystals and their study	2		2
9. Minerals: definition and classification	2		2
10. Physical propertires of minerals	2		2
11. Optical and cohesion properties for identification	2		2
12. Minerals of igneous origin	2		2
13. Minerals of sedimentary and metamorphic origin	2		2
14. Summary and Review	2		2
Total hours	**28**		**28**

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	recognize the fundamentals of HistrocialGeology,	✓	✓	✓			✓
	a2.	state the cases of solid material, crystal forms and systems,	✓	✓		✓		
	a3.	characterize each of the physical proporeties of minerals,	✓		✓		✓	✓
	a4.	identify the basics of mineral classification and rock dating techniques.	✓	✓			✓	✓
Intellectual Skills	b1.	interpret the past as interpolation of the present using fossils,	✓	✓			✓	
	b2.	explain the methods of rock and material age determination,	✓			✓	✓	✓

	b3.	describe the different crystal systems and forms,	✓	✓		✓	✓	
	b4.	examine the various types of data related to minerals and their characteristicss and formation,	✓	✓	✓			✓
	b5.	explore the different mineral categories and their origin.	✓		✓			✓
Practical and professional skills	c1.	study the different theories in Historical Geology,	✓		✓		✓	✓
	c2.	identify the different types of fossils and casts,	✓		✓		✓	✓
	c3.	apply the principals for the classification of crystals and minerals,	✓	✓	✓			✓
	C4.	depict interpretations of physical properties for mineral identification.	✓				✓	✓
General Skills	d1.	review the available literature on historical Geology and related branches,	✓	✓	✓			✓
	d2.	combine different data for problem-solving,	✓	✓	✓			✓
	d3.	use knowledge and training for the identification of earth materials,	✓	✓	✓		✓	✓
	d4.	work in a group and collaborate with peers.	✓	✓				✓

5. Students' Assessment Methods and Grading:

51. Discussion, class activities and quizzes to assess the student' progress and personal attitude,
52. Assignments to assess the student independent work,
53. Written mid-term exam to ensure the student progress and discover the shortage,
54. Final written and oral exam to evaluate students and promote other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1,a2, a3, b1, b3 and b4	Fifth week	6 %
Mid-Term Exam	a1, a2, b1, b2, and b3	Seventh week	8 %
Practical Exam	B2, b4, c1, c2, b2, and c3	Thirteenth week	24 %
Oral exam	a2, a3, a4, b2,b3,b5, c1,c2	Thirteenth week	14 %
Final written exam	a2, a3, b2, b4, c2, c3, d3, d4.	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and histroy of the science	x						x						x			
Origin of the Earth		X				x					x					x
Theories in Hsitorical Geology				X												
Method of rock age dating and geologic time scale			x													
Cases of solid material				X										x		
Crystal systems										x						
Crystal symmetry and forms		X						x						x		
Example crystals and their study			x										x			
Minerals: definition and classification		X							x						x	
Physical propertires of minerals	x											x		x		
Optical and cohesion properties for identification			x			x							x			
Minerals of igneous origin		X								x					x	
Minerals of sedimentary and metamorphic origin		X														x
Summary and Review			x											x		

6.List of references:

6.1. Course notes

Lecture notes prepared by the course instructor(s) and approved by the department council, Power point presentations uplaoded to the university website.

6.2 . Required books

None

6.3. Recommended books

The Essential Guide to Crystals, Minerals and Stones
By Margaret Ann Lembo
Llewellyn Publications (April 8, 2013)
Historical Geology
by Reed Wicander &James S. Monroe
Cengage Learning; 7 edition (2012)

6.4. Periodicals, Web sites, etc.

7. Facilities required for teaching and learning:

Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinators:	Assistant Prof. Moustafa Mogahed Assistant Prof. Adel Maady
Head of the Department:	Prof. Gamal El Qot
Date:	2022/2023

Course Specification
105 G: General Geology

A. Affiliation

Relevant program: **B.Sc. in Geology**
Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **First level**

B . Basic information

Title: General Geology	**Code:105G**	**Year/level:** First level
Teaching Hours:	**Lectures:** 1	**Tutorial:** 0
	Practical: 2	**Total:**3 h/week

C . Professional information

1. Course Learning Objectives:

The objective of this course is to enable the students to understand the fundamentals and methods of Physical Geology, Histroical Geology and Minerals in different fields and to investigate techniques used in these sciences. The student by the end of the course should be able to analyze and evaluate facts and problems in minerals, crystals and Earth evolution.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should be able to:

- **a1.** recognize the fundamentals of Histrocial Geology,
- **a2.** state the cases of solid material, crystal forms and systems,
- **a3.** characterize each of the physical proporeties of minerals,
- **a4.** identify the basics of mineral classification and rock dating techniques.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

- **b1.** interpret the past as intrapolation of the present using fossils,
- **b2.** explain the methods of rock and material age determination,
- **b3.** describe the different crystal systems and forms,
- **b4.** examin the various types of data related to minerals and their characterstics and formation,
- **b5.** explore the different mineral categories and their origin.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

- **c1.** study the different theories in Historical Geology,
- **c2.** identify the diffent types of fossils and casts,
- **c3.** apply the pricicpals for classification of crystals and minerals,
- **c4.** depict interpretations of physical properties for mineral identification.

d. General skills:

On successful completion of the course, the student should be able to:

- **d1.** review available literature on historical Geology and related branches,
- **d2.** combine diffenent data for problem solving,
- **d3.** use knoweldge and training for identification of earth materials,
- **d4.** work in a group and collaborate with peers.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction and histroy of the science	1		2
2. Origin of the Earth	1		2
3. Principles of Hsitorical Geology	1		2
4. Methods of rock age dating and geologic time scale	1		2
5. Cases of solid material	1		2
6. Crystal systems	1		2
7. Crystal symmetry and forms	1		2
8. Example crystals and their study	1		2
9. Minerals: definition and classification	1		2
10. Physical propertires of minerals	1		2
11. Optical and cohesion properties for identification	1		2
12. Minerals of igneous origin	1		2
13. Minerals of sedimentary and metamorphic origin	1		2
14. Summary and Review	1		2
Total hours	**14**		**28**

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	recognize the fundamentals of Histrocial Geology,	✓	✓	✓			✓
	a2.	state the cases of solid material, crystal forms and systems,	✓	✓		✓		
	a3.	characterize each of the physical proporeties of minerals,	✓		✓		✓	✓
	a4.	identify the basics of mineral classification and rock dating techniques.	✓	✓			✓	✓
Intellectual Skills	b1.	interpret the past as intrapolation of the present using fossils,	✓	✓			✓	
	b2.	explain the methods of rock and material age determination,	✓			✓	✓	✓

	b3.	describe the different crystal systems and forms,	✓	✓		✓	✓	
	b4.	examin the various types of data related to minerals and their characterstics and formation,	✓	✓	✓			✓
	b5.	explore the different mineral categories and their origin.	✓		✓			✓
Practical and professional skills	c1.	study the different theories in Historical Geology,	✓		✓		✓	✓
	c2.	identify the diffent types of fossils and casts,	✓		✓		✓	✓
	c3.	apply the pricicpals for classification of crystals and minerals,	✓	✓	✓			✓
	C4.	depict interpretations of physical properties for mineral identification.	✓				✓	✓
General Skills	d1.	review available literature on historical Geology and related branches,	✓	✓	✓			✓
	d2.	combine diffenent data for problem solving,	✓	✓	✓			✓
	d3.	use knoweldge and training for identification of earth materials,	✓	✓	✓		✓	✓
	d4.	work in a group and collaborate with peers.	✓	✓				✓

5. Students' Assessment Methods and Grading:

51. Discussion, class activities and quizzes to assess the student progress and personal attitude,
52. Assignments to assess the student independent work,
53. Written mid-term exam to ensure the student progress and discover the shortage,
54. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1,a2, a3, b1, b3 and b4	Fifth week	6 %
Mid-Term Exam	a1, a2, b1, b2, and b3	Seventh week	8 %
Practical Exam	B2, b4, c1, c2, b2, and c3	Thirteenth week	24 %
Oral exam	a2, a3, a4, b2,b3,b5, c1,c2	Thirteenth week	14 %
Final written exam	a2, a3, b2, b4, c2, c3, d3, d4.	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and histroy of the science	x						x						x			
Origin of the Earth		x				x					x					x
Theories in Hsitorical Geology				X												
Method of rock age dating and geologic time scale			x													
Cases of solid material				X										x		
Crystal systems						x				x						
Crystal symmetry and forms		x						x						x		
Example crystals and their study			x										x			
Minerals: definition and classification		x							x						x	
Physical propertires of minerals	x						x					x		x		
Optical and cohesion properties for identification			x			x							x			
Minerals of igneous origin		x								x					x	
Minerals of sedimentary and metamorphic origin		x														x
Summary and Review			x											x		

6.List of references:

6.1. Course notes

Lecture notes prepared by the course instructor(s) and approved by the department council, Power point presentations uplaoded to the university website.

6.2 . Required books

None

6.3. Recommended books

The Essential Guide to Crystals, Minerals and Stones
By Margaret Ann Lembo
Llewellyn Publications (April 8, 2013)
Historical Geology
by Reed Wicander &James S. Monroe
Cengage Learning; 7 edition (2012)

6.4. Periodicals, Web sites, etc.

7. Facilities required for teaching and learning:
Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinators:	Assistant Prof. Moustafa Mogahed Assistant Prof. Adel Maady
Head of the Department:	Prof. Gamal El Qot
Date:	2022/2023

Course Specification

100 Ch: General Chemistry (1)

A. Affiliation

Relevant program:	B.Sc. in Geology Program
Department offering the program:	Department of Geology
Department offering the course:	Department of Chemistry
Academic year/level:	First level

B. Basic information

Title: General Chemistry	**Code:** 100 Ch	**Year/Level:** First level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 1
	Practical: 0	**Total:**3 h/week

C. Professional information

1. Course Learning Objectives:

The objective of this course is to enable the students to study the atomic structures, gases laws, Chemical bondings, geometrical configuration, state of matter. Also to enable the differentiate between acidic and basic radicals.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Identify chemical formulae of inorganic and units of some parameters.

a2. recognize characteristics of different states of the matter and practical elements including trends within the periodic table and related theories.

a3. define the chemical concepts of inorganic and physical chemistry.

a4. recognize theories of chemical bonding and molecular orbital diagram for diatomic molecules.

a5. State the principles of thermochemistry.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Differentiate between the different states of the matter, elements and compounds based on the recognition and quantification of the properties.

b2. Solve chemical problems using computational.

b3. Analyze collected chemical data using some data processing skills.

b4. Point out different concepts in inorganic and physical chemistry.

b5. Analyze chemical data to identify the compositions and chemical structures of inorganic and organic compounds.

b6. Determine the properties of different states of matter (gases, liquids and solids).

b7. Predict the different shapes of different inorganic materials.

c. Practical and professional skills:

On successful completion of the course, the student should be able to:

c1. Determine the chemical formulae and geometrical shapes of organic and inorganic molecules.

c2. Apply the knowledge that the student studied to propose the molecular structures of the molecules.

C3. Investigate and identify the acidic and basic radicals.

d. General skills:

On successful completion of the course, the student should be able to:

d1. Use computers and internet for information and communication technology. effectively related to uses of this instruments.

d2. Solve problems on the scientific basis taught in this course.

d3. Work in a team effectively, manage time, collaborate and communicate with others positively.

d4. Help raising public awareness of the benefits of conserving intellectual. property rights and scientific patents on the individuals and communities.

3. Contents

Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
1. Introduction to General Chemistry and the Units	2	1	0
Identify chemical formulae of inorganic	2	1	0
Characteristics of different states of the matter and elements including trends within the periodic table and related theories.	2	1	0
Study the chemical bonding	2	1	0
State the principles of electrochemistry.	2	1	0
Study the molecular orbital diagram for diatomic molecules.	2	1	0
Mid Term Exam.	2	1	0
Molecular structure	2	1	0
Study the state of matter	2	1	0
Thermochemistry study	2	1	0
Stoichiometric study.	2	1	0
Atomic structure	2	1	0
Hybridization	2	1	0
Revision	2	1	0
Total hours	**28**	14	0

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Tutorial Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	Identify chemical formulae of inorganic and units of some parameters.	✓		✓			✓
	a2.	Recognize characteristics of different states of the matter and practical elements including trends within the periodic table and related theories.	✓				✓	
	a3.	Define the chemical concepts of inorganic and physical chemistry.	✓	✓	✓		✓	✓
	a4.	Recognize theories of chemical bonding and molecular orbital diagram for diatomic molecules. .	✓	✓	✓		✓	✓
	a5.	State the principles of thermochemistry.	✓					✓
Intellectual Skills	b1.	Differentiate between the different states of the matter, elements and compounds. based on the recognition and quantification of the properties.	✓	✓	✓		✓	✓
	b2.	Solve chemical problems using computational.	✓		✓		✓	✓
	b3.	Explain the bond lengths, geometries, magnetism, and color of the transition metal complexes depending on understanding of their bonding theories.	✓	✓	✓		✓	✓
Practical and professional skills	c1.	Determine the chemical formulae and geometrical shapes of organic and inorganic molecules.	✓		✓		✓	✓
	c2.	Apply the knowledge that the student studied to propose the molecular structures of the molecules.	✓		✓		✓	✓
	C3.							
General Skills	d1.	Use computers and internet for information and communication technology effectively related to uses of these instruments.	✓					✓
	d2.	Solve problems on the scientific basis taught in this course.	✓		✓		✓	✓
	d3.	Work in a team effectively, manage time, collaborate and communicate with others positively.	✓		✓			✓

	d4.	Help raising public awareness of the benefits of conserving intellectual property rights and scientific patents on the individuals and communities.	✓					✓

5. Students' Assessment Methods and Grading:

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a3, b2, and d1	Fifth week	5 %
Mid-Term Exam	a1, a2, a3, a4, b2, d1, and d2	sixth week	5 %
Oral exam	a1, a2, a3, a4, b1, b2, b3, c1, c2, and d4	Thirteenth week	10 %
Written exam	a1, a2, a3, a4, b1, b2, b3, c1, c2, d1, and d4	Fourteenth week	80 %
Total			100 %

6. List of references:
6.1. Course notes
Lecture notes approved by Chemistry Department.

6.2. Required books.

Peter Atkin, Loretta Jones, Leroy Laverman, Chemical Principle, Sixth Edition, W.H. Freeman, 2012.

6.3. Recommended books

1- J.D. Lee, Concise Inorganic Chemistry, 5th Edn. Blackwell Science, Australia, 1996.

2- N.N. Greenwood, A. EarnShaw, Chemistry of Elements,2nd Edn, Butterworth Heinemann, USA 1997.

6.4. Periodicals, Web sites, etc.

Journal of *Chemical Education* (ACS)
Inorganic Chemistry (ACS)
http://www.public.asu.edu/~jpbirk/CHM-115_BLB/Chpt24/
http://ocw.mit.edu/courses/chemistry/5-112-principles-of-chemical-science-fall-2005/
http://www.docbrown.info/page07/appendixtrans11.htm

7. Facilities required for teaching and learning:

Using a microphone in lectures
Using of slit overhead projector
Using a black board
Group Discussions
Data show

Course coordinator:	Prof. Dr. Mohamed Hekal Prof. Dr. Mostafa Yassin Nassar Prof. Dr. Eman Abdullah Prof. Dr. Sabry Hamed Prof. Dr. Maher El-Naggar
Head of the Department:	Prof. Dr. Wagdy Eldougdoug
Date:	2022-2023

Course Specification
General Mathematics (1) – 100 M

A. Affiliation

Relevant program: B.Sc. in Geology Program

Department offering the program: Department of Geology
Department offering the course: Mathematics Department
Academic year/level: First level / First Semester
Date of specifications approval:

B. Basic information

Title:	**Code:**	**Year/level:**
General Mathematics (1)	**100 M**	**First level / First Semester**
Teaching Hours:	**Lectures: 2h/week**	**Tutorial: 2h/week**
	Practical: 0	**Total:4 h/week**

C. Professional information

1. Course Learning Objectives:

At the end of this course, the students must be able to:

Postulate concepts and choose appropriate solutions to solve problems on scientific basis, apply mathematical knowledge and skills to the solution of real-life problems.

2. Intended Learning Outcomes (ILOS)
a. Knowledge and understanding:
At the end of this course, the students must be able to:
a1. Know Mathematical knowledge in solving different problems.

a2. Determine knowledge of the principles of mathematical modeling and applications.

a3. State and explain the meaning of complicated statements using mathematical notations and language.

a4. Deal wide background knowledge related to the different branches of Mathematics.
b. Intellectual skills:
At the end of this course, the students must be able to:
b1. Apply the knowledge of the mathematical processes for modeling of real-world problems.
b2. Develop appropriate knowledge and awareness of the importance and applications of mathematical assumption.

c. Practical and professional skills:
At the end of this course, the students must be able to:
c1. Analyze the concepts and methods of mathematics to the solution of the real problems in professional practice.
c2. Examine competence in the use of mathematical methods in problem solving.
c3-Investigate confidence in their abilities to use mathematics.

d. General skills:

At the end of this course, the students must be able to:

d1. Think independently and solve problems on scientific basis.

d2. Work in a team effectively; manage time, collaborate and communicate with others positively.

d3. Deal with property rights legally and ethically.

3. Contents			
Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
Mathematical induction	**2**	**2**	**-**
partial fractions	**2**	**2**	**-**
polynomials	**2**	**2**	**-**
Determinants	**2**	**2**	
Matrices	**2**	**2**	**-**
Linear systems	**2**	**2**	**-**
Mid Term Exam and Series	**2**	**2**	**-**
Taylor series	**2**	**2**	
Limits	**2**	**2**	
Continuity	**2**	**2**	**-**
Differentiation of Real valued functions	**2**	**2**	**-**
Applications on Differentiation	**2**	**2**	**-**
Integration	**2**	**2**	**-**
Finite integral	**2**	**2**	**-**
Total hours	**28**	**28**	**-**

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Tutorial	Problem solving	Brain storming
Knowledge & Understanding	a1.	Know Mathematical knowledge in solving different problems.	✓				✓	
	a2.	Determine knowledge of the principles of mathematical modeling and applications.	✓				✓	
	a3.	State and explain the meaning of complicated statements using mathematical notations and language.	✓				✓	
	a4.	Deal wide background knowledge related to the different branches of Mathematics.	✓				✓	
Intellectual Skills	b1.	Apply the knowledge of the mathematical processes for modeling of real-world problems.			✓			✓
	b2.	Develop appropriate knowledge and awareness of the importance and applications of mathematical assumption.			✓			✓
Practical and professional skills	c1.	Analyze the concepts and methods of mathematics to the solution of the real problems in professional practice.	✓				✓	
	c2.	Examine competence in the use of mathematical methods in problem solving.	✓			✓	✓	
	c3.	Investigate confidence in their abilities to use mathematics.	✓				✓	
General Skills	d1.	Think independently and solve problems on scientific basis.		✓	✓	✓		
	d2.	Work in a team effectively; manage time, collaborate and communicate with others positively.		✓	✓			
	d3.	Deal with property rights legally and ethically.		✓	✓			

5. Students' Assessment Methods and Grading:

Tools:	**To Measure**	**Time schedule**	**Grading**
Mid-Term Exam	**a1, a2**	**Week 7**	**10 %**
Oral exam	**a1, a2, c1, c2**	**Week 15**	**10 %**
Practical exams			

Written exam	**a1, a2, c1, c2, d1**	**Start of the sixteenth week**	**80 %**
Total			**100 %**

6. List of references:

6.1. Course notes

-Notes approved by Math. Department.

6.2. Required books.

- Virgil Snyder, Elementary textbook on the calculus. New York, (1912).

6.3. Recommended books.

- WWL Chen, Notes on first-year calculus, (web edition, 2008).

6.4. Periodicals, Web sites, etc.

https://cims.nyu.edu/~kiryl/Calculus/Section_5.3--Evaluating_Definite_Integrals/RSimpson-Lecture24.pdf
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.368.2271&rep=rep1&type=pdf
http://www.maths.manchester.ac.uk/~bespalov/teaching/2E1_LA_notes_1.pdf
https://people.richland.edu/james/lecture/m116/matrices/

7. Facilities required for teaching and learning:

Black board and white board

Course coordinator: Dr. Nahed Al-Mahdi, Dr. Ahmed Abdel khaleq, Dr. Mohamed Abdelaal, and Dr. Mohamed Abdeljawad.

Head of the Department: Prof. Dr. Reda Gamal Abd El Rahman Khaled

Date: 2022-2023

Course Specification
100 Ph: General Physics (1)

A. Affiliation

Relevant program: B.Sc. in Geology Program

Department offering the program: Department of Geology
Department offering the course: Department of Physics
Academic year/level: First level

B. Basic information

Title: General Physics (1)	**Code:** 100 Ph	**Year/level:** First level
Teaching Hours:	**Lectures: 2**	**Tutorial: 1**
	Practical: 0	**Total:**3 h/week

C. Professional information

1. Course Learning Objectives:

The objective of this course enable the student to:

Collect and recognize a lot of knowledge about the main topics of the Properties of Matterand Heat, such as the elasticity and plasticity of material, the different types of stresses and strains , moment of inertia , simple harmonic motion in addation to the different types of wave equation and interference of waves and some basics of fluid dynamics. Study Unary phase digrame of matter, types of thermometers and temprature scales, heat conduction and radiation, methods of specific heat measurments and Gas laws and thermodynamics. This will supported by some applications in each field .

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1.Understanding the concept of matter, Heate , Simple harmonic motion , fluid dynamics , types of heat counductions and thermodynamics

a2. Describe the moment of inertia of rigid body and phase digram

a3. Recognize the different types of wave motion such as simple pindulumn,oscillating spring and ,wave equation and interference of waves

a4. Memorize between the different types of stresses – strains of matter, thermometers and temperature scales .

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Interpret the dimension theory, waves nature, heat transform and thermodynamics.

b2. Apply some models to exam the validity of physical law.

b3. Combine a lot of information about physical meaning of course topics.

b4. Compare between the physical properties for different types of materials

c. Practical and professional skills:

On successful completion of the course, the student should be able to:

C1. Sketch the phase diagram stress- strain curve for different types of materials.

C2. Analyze the output data from each technique.

C3. Investigate physical properties from tables and graphs.

d. General skills:

On successful completion of the course, the student should be able to:

d1. Work in team to synthesis and studying some physical properties of some materials .

d2. solve physical problems on scientific basis

d3. Use computers and internet for communication

No.	Topic	Lecture hours	Tutorial hours	Practical hours
1	Physical quantity	2	1	
2	Dimension theory	2	1	
3	Unites	2	1	
4	balance equation	2	1	
5	Types of motion	2	1	
6	Motion in different directions	2	1	
7	Mid- Term Exam & review	2	1	
8	Second newton low of motion	2	1	
9	Work and energy	2	1	
10	Introduction in heat	2	1	
11	Heat and heat transfer	2	1	
12	Kinetic theory of gases	2	1	
13	Specific heat of gases	2	1	
14	First law of thermodynamics	2	1	
Total hours		**28**	14	

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Tutorial	Problem solving	Brain storming
Knowledge & Understanding	a1.	Investigate and recognize the concept of matter, Heate , Simple harmonic motion , fluid dynamics , types of heat counductions and thermodynamics	✓		✓	✓	✓	
	a2.	Describe the moment of inertia of rigid body and phase digram	✓			✓	✓	✓
	a3.	Recognize the different types of wave motion such as simple pindulumn, oscillating spring and ,wave equation and interference of waves	✓		✓	✓	✓	
	a4.	Memorize between the different types of stresses – strains of matter, thermometers and temperature scales	✓		✓	✓	✓	
Intellectual Skills	b1.	Interpret the dimension theory, waves nature, heat transform and thermodynamics	✓			✓	✓	
	b2.	Apply some models to exam the validity of physical low	✓		✓	✓	✓	✓
	b3.	Combine a lot of information about physical meaning of course topics	✓			✓	✓	
	b4.	Compare between the physical properties for different types of material	✓			✓	✓	
Practical and professional skills	c1.	Sketch the phase diagram stress-strain curve for different types of materials and	✓			✓	✓	
	c2.	Analyze the output data from each technique	✓		✓	✓	✓	
	c3.	Investigate physical properties from tables and graphs	✓		✓	✓	✓	
General Skills	d1.	Work in team to synthesis and studying some physical properties of some materials .	✓			✓	✓	✓
	d2.	solve physical problems on scientific basis	✓		✓	✓	✓	
	d3.	Use computers and internet for communication	✓		✓	✓	✓	✓

5. Students' Assessment Methods and Grading:

Tools:	To Measure	**Time schedule**	**Grading**
Semester Work	a1, a2, a.4, b1, b2, b3, c.1, c.2, d1, d.2 and d.3	Fifth week	5%
Mid-Term Exam	a1, a2, a5, b2, c.2, c3 and d.2,	Seventh week	5%
Oral exam	a1, a3, b4, b1, b3, c1, and d3	Fifteenth week	10%
Written exam	a1 to a4, b1 to b4, c1 to c3 and d2	Sixteenth week	80%
Total			100 %

6.List of references:

6.1. Course notes

Lecture notes approved by Physics department.

6.2. Required books.

Fundamentals of Physics Extended, 9th Edition, David Halliday, Robert Resnick, Jearl Walker (2011)

6.3. Recommended books.

1- General Physics and heat (G.A. Grant) Published by Edward Arnold, 1977
ISBN 10: 071312623X / ISBN 13: 9780713126235

2- General Physics, 2nd Edition by Morton M. Sternheim and Joseph W. Kane

6.4. Periodicals, Web sites, etc.

http://www. Physics2000
http://www. Physics today

7. Facilities required for teaching and learning:

Using a microphone in lectures
Using a black board
Group Discussions
Data show

Course coordinator:

Prof. Dr. Lotfy Abu-Salem
Prof. Dr. Saeed El-Sayed Abdel Ghany
Prof. Dr. Mohamed Abdel-Moneim

Head of the Department: Prof. Dr. Saeed El-Sayed Abdel Ghany

Date: 2022-2023

Course Specification

105 Ch: General Chemistry (2)

A. Affiliation

Relevant program: B.Sc. in Geology Program
Department offering the program: Department of Geology
Department offering the course: Department of Chemistry
Academic year/level: First level

B. Basic information

Title: General Chemistry (2)	**Code:** 105 Ch	**Year/level:** First level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 1
	Practical:	**Total:**3 h/week

C. Professional information

1. Course Learning Objectives:

The objective of this course is to enable the students to understand Chemical equilibrium, ionic equilibrium, solution, introduction to qualitative analysis. Introduction to organic chemistry, chemical bonding in organic chemistry, hybridization in carbon atom, nomenclature of organic compounds, reactions and physical properties of alkanes, alkenes and alkynes.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Recognize the general properties of solutions.
a2. Define concepts as chemical equilibrium and ionic equilibrium.
a3. Name of different organic compounds.
a4. Recognize theories of chemical bonding and hybridization in carbon atom
a5. Identify physical and chemical properties of alkanes, alkenes and alkynes.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Illustrate the features of solution.
b2. Differentiate between different types of hybridization in carbon atom.
b3. Predict the names of different alkanes, alkenes and alkynes.
b4. Distinguish between chemical and physical properties of alkanes, alkenes and alkynes.
b5. Explain chemical equilibrium and ionic equilibrium.

c. Practical and professional skills:

On successful completion of the course, the student should be able to:

c1. Apply techniques of qualitative analysis.
c3. Identify the different liquid organic compounds.
c2. Solve problems to learn the structure of organic compounds.

d. General skills:

On successful completion of the course, the student should be able to:

d1. Solve problems on the scientific basis taught in this course

d2. Work in a team effectively, manage time, collaborate and communicate with others positively.

d3. Help raising public awareness of the benefits of conserving intellectual property rights and scientific patents on the individuals and communities.

3. Contents

Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
1. Chemical equilibrium.	2	1	
2. Ionic equilibrium.	2	1	
3. Solution.	2	1	
4. Introduction to qualitative analysis.	2	1	
5. Introduction to organic chemistry.	2	1	
6. Chemical bonding in organic chemistry.	2	1	
7. Mid-Term Exam (Hybridization in carbon atom sp3)	2	1	
8. Hybridization in carbon atom (sp2, sp and some examples)	2	1	
9. Nomenclature of organic compounds	2	1	
10. Physical and chemical properties of alkanes	2	1	
11. Physical and chemical properties of cycle alkanes	2	1	
12. Physical and chemical properties of alkenes	2	1	
13. Physical and chemical properties of alkynes	2	1	
14. Revision	2	1	
Total hours	**24**	14	

4 - Teaching and Learning methods:

Intended Learning Outcomes			**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Knowledge & Understanding	a1.	Recognize the general properties of solutions.	✓		✓			✓
	a2.	Define concepts as chemical equilibrium and ionic equilibrium.	✓					✓
	a3.	Name of different organic compounds.	✓	✓			✓	
	a4.	Recognize theories of chemical bonding and hybridization in carbon atom	✓				✓	✓
	a5.	Identify physical and chemical properties of alkanes, alkenes and alkynes.	✓					✓
Intellectual Skills	b1.	Illustrate the features of solution.	✓	✓		✓		✓
	b2.	Differentiate between different types of hybridization in carbon atom.	✓	✓	✓		✓	✓

	b3.	Predict the names of different alkanes, alkenes and alkynes	✓		✓		✓	✓
	b4.	Distinguish between chemical and physical properties of alkanes, alkenes and alkynes.	✓		✓		✓	✓
	b5.	Explain chemical equilibrium and ionic equilibrium.	✓				✓	✓
Practical and professional skills	c1.	Apply techniques of qualitative analysis to identify the liquid compounds	✓		✓		✓	✓
	c2.	Identify the different liquid organic compounds.	✓		✓			✓
	c3.	Solve problems to learn the structure of organic compounds	✓		✓			✓
General Skills	d1.	Solve problems on the scientific basis taught in this course.	✓					✓
	d2.	Work in a team effectively, manage time, collaborate and communicate with others positively.	✓				✓	✓
	d3.	Help raising public awareness of the benefits of conserving intellectual. property rights and scientific patents on the individuals' communities.	✓		✓			✓

5. Students' Assessment Methods and Grading:

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a3, b2, c2, c3 and d1	Fifth week	5 %
Mid-Term Exam	a1, a2, a3, a4, a4, b1, b2, b3, c1, c2, d1, and d2	Seventh week	5 %
Oral exam	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, c2, and d3	Thirteenth week	10 %
Written exam	a1, a2, a3, a4, a5, b1, b2, b3, b5, c1, c2, d1, d2 and d3	Fourteenth week	80 %
Total			100 %

6. List of references:

6.1. Course notes

Lecture notes approved by the Department of Chemistry.

6.2. Required books.

Koltz & Treichel, Chemistry and Chemical Reactivity 6th Ed.

6.3. Recommended books

Martin S. Silberberg *Chemistry: The Molecular Nature of Matter and Change* 6th Ed.

6.4. Periodicals, Web sites, etc.

Journal of Chemical Education (ACS)
Analytical Chemistry (ACS)
http://www.public.asu.edu/~jpbirk/CHM-115_BLB/Chpt24/
http://ocw.mit.edu/courses/chemistry/5-112-principles-of-chemical-science-fall-2005/
http://www.docbrown.info/page07/appendixtrans11.htm

7. Facilities required for teaching and learning:

Using a microphone in lectures
Using a black board
Group Discussions
Data show

Course coordinator:	Dr. Shwekar Tawfik Dr. Abdelmotaal A. El-Sheikh
Head of the Department:	Prof. Dr. Wagdy Eldougdoug
Date:	2022-2023

Course Specification
General Mathematics (2) – 105 M

A. Affiliation

Relevant program: Geology B.Sc. Program

Department offering the program: Geology Department
Department offering the course: Mathematics Department
Academic year/level: First level / Second Semester
Date of specifications approval:

B. Basic information

Title:	**Code:**	**Year/level:**
General Mathematics (2)	**105M**	**First level / Second Semester**
Teaching Hours:	**Lectures: 2h/week**	**Tutorial: 2h/week**
	Practical: —	**Total:4 h/week**

C. Professional information

1. Course Learning Objectives:

At the end of this course, the students must be able to:
Postulate concepts and choose appropriate solutions to solve problems on scientific basis, apply mathematical knowledge and skills to the solution of real-life problems, complementing to course100 M.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

At the end of this course, the students must be able to:

a1. KnowMathematical knowledge in solving different problems.

a2. Determine knowledge of the principles of mathematical modeling and applications.

a3. State and explain the meaning of complicated statements using mathematical notations and language.

a4. Deal wide background knowledge related to the different branches of Mathematics.

b. Intellectual skills:

At the end of this course, the students must be able to:

b1. Apply the knowledge of the mathematical processes for modeling of real-world problems.

b2. Develop appropriate knowledge and awareness of the importance and applications of mathematical assumption.

c. Practical and professional skills:

At the end of this course, the students must be able to:

c1. Analyze the concepts and methods of mathematics to the solution of the real problems in professional practice.

c2. Examine competence in the use of mathematical methods in problem solving.

d. General skills:

At the end of this course, the students must be able to:

d1. Think independently and solve problems on scientific basis.

d2. Work in a team effectively; manage time, collaborate and communicate with others positively.

d3. Deal with property rights legally and ethically.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Integration	2	2	-
Finite Integration	2	2	-
Integration Methods (1)	2	2	-
Integration Methods (2)	2	2	-
Integration Methods (3)	2	2	
Applications of Finite Integration.	2	2	-
Mid-Term Exam, Introduction in Plan geometry	2	2	-
Straight Line	2	2	-
Circle	2	2	-
Conic sections (1)	2	2	-
Conic sections (2)	2	2	-
Space geometry	2	2	-
Geometric transformations	2	2	-
Surfaces	2	2	-
Total hours	28	28	-

4. Teaching and Learning methods:								
Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Tutorial	Problem solving	Brain storming
Knowledge & Understanding	a1.	Know Mathematical knowledge in solving different problems.	✓				✓	
	a2.	Determine knowledge of the principles of mathematical modeling and applications.	✓				✓	
	a3.	State and explain the meaning of complicated statements using mathematical notations and language.	✓				✓	
	a4.	Deal wide background knowledge related to the different branches of Mathematics.	✓				✓	
Intellectual Skills	b1.	Apply the knowledge of the mathematical processes for modeling of real-world problems.			✓	✓		✓
	b2.	Develop appropriate knowledge and awareness of the importance and applications of mathematical assumption.			✓			✓
Practical and professional skills	c1.	Analyze the concepts and methods of mathematics to the solution of the real problems in professional practice.	✓				✓	
	c2.	Examine competence in the use of mathematical methods in problem solving.	✓			✓	✓	
General Skills	d1.	Think independently and solve problems on scientific basis.		✓	✓	✓		
	d2.	Work in a team effectively; manage time, collaborate and communicate with others positively.		✓	✓			
	d3.	Deal with property rights legally and ethically.		✓	✓			

5- Students' Assessment Methods and Grading:			
Tools:	**To Measure**	**Time schedule**	**Grading**
Mid-Term Exam	**a1, a2**	**Week 7**	**10 %**
Oral exam	**a1, a4, c1, c2**	**Week 15**	**10 %**
Practical exams			

Written exam	**a1, a2, c1, c2, d1**	**Start of the sixteenth week**	**80 %**
Total			**100 %**

6. List of references:

6.1. Course notes

-Notes approved by Math. Department.

6.2. Required books.

- Virgil Snyder, Elementary textbook on the calculus. New York, (1912).

6.3. Recommended books.

- WWL Chen, Notes on first-year calculus, (web edition, 2008).

-George R., The Elements of Plane Analytic Geometry, BiblioBazaar (2008).

6.4. Periodicals, Web sites, etc.

https://en.wikipedia.org/wiki/Conic_section
http://www.stewartcalculus.com/data/ESSENTIAL%20CALCULUS%20Early%20Transcendentals/upfiles/ess-reviewofconics.pdf
http://www.intmath.com/methods-integration/methods-integration-intro.php
http://www.intmath.com/methods-integration/7-integration-by-parts.php
https://en.wikipedia.org/wiki/Line_(geometry)
http://www.mathsisfun.com/geometry/circle.html

7. Facilities required for teaching and learning:

Black board and white board

Course coordinator: Prof. Dr. Sayed Shahata, Prof. Dr. Abdelrahim El-Naggar, Prof. Dr. Mahmoud Abdel-Moaty, Dr. Hebba El-Sayed Fathy, Dr. Amr Soliman, and Dr. Mostafa Hassan.

Head of the Department: Prof. Dr. Reda Gamal Abd El Rahman Khaled

Date: 2022-2023

Course Specification
105 Ph: General Physics (2)

A. Affiliation

Relevant program: B.Sc. in Geology Program
Department offering the program: Department of Geology
Department offering the course: Department of Physics
Academic year/level: First level

B. Basic information

Title: General Physics (2)	**Code:** 105 Ph	**Year/level:** First level
Teaching Hours:	**Lectures:** 2	**Tutorial: 1**
	Practical: 0	**Total** 2 h/week

C. Professional information

1. Course Learning Objectives:

By Finishing of this course the graduate will able to collect a lot of scientific information about theories of light and their applications in optical instruments. Study some of the the physical properties for mirrors and lenses . Tell about the eye and farsightedness and nearsightedness. Discover the different types of optical instruments. Understanding the electric and magnetic forces and diffrentiate among field ,potential and electromagnetic force . memorize the types of capacitores and dielectric materials . skach some of the electric circuites

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Memorise a lot of scientific information about theories of light and electromagnetic field and the applications of each other

a2. understanding magnetic and electric field nature in addition to mirror and lenses equations

a3. tell about the function of eye, electric circuits and capacitors.

b. Intellectual skills:

On successful completion of the course, the student should be able to:

b1. Interpret data from each optical or electromagnetic systems.

b2. Assess according to beam reflection what is nature of surface and wave and according to electromagnetic induction what is the nature of source.

b3. Design optical and electromagnetic system by logic way

b4. compare between the use of microscope and telescope and lenses and mirrors and application of

c. Practical and professional skills:

On successful completion of the course, the student should be able to.

c1. conduct some experiments using lenses in addition to mirrors and electric circuits.

c2. Analyze the out-pout data from optical and electromagnetic techniques.

c3. Apply the optical and electromagnetic phenomena in modern area applications.

d. General skills:

On successful completion of the course, the student should be able to.

d1. Solve problems concerning to the course topics

d2. Communicate to work efficiently in a team or separately.

d3. Collect data and wrighting reports in the different model and fields

3. Contents

No.	Topic	Lecture hours	Tutorial hours	Practical hours
1	The nature and propagation of light	2	1	
2	Reflection and refraction of spherical wave at plane and spherical surfaces	2	1	
3	Mirrors and Lenses	2	1	
4	the structure of the eye	2	1	
5	Cameras, microscopes and Telescopes	2	1	
6	Colom's Low	2	1	
7	**Med-Term Exam**& continuity of Colom's low	2	1	
8	Electrostatic field and potential	2	1	
9	Capacitors	2	1	
10	Dielectric materials	2	1	
11	Electric Current and DC Circuits	2	1	
12	Kirchhoff Law and electric circuit analysis	2	1	
13	Magnetic field and forces	2	1	
14	Electromagnetic induction	2	1	
	Total hours	**28**	14	

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Tutorial	Problem solving	Brain storming
Knowledge & Understanding	a1.	Memorise a lot of scientific information about theories of light and electromagnetic field and the applications of each other	✓		✓	✓	✓	
	a2.	understanding magnetic and electric field nature in addition to mirror and lenses equations	✓		✓	✓		✓
	a3.	tell about the function of eye, electric circuits and capacitors	✓	✓	✓	✓		✓
Intellectual Skills	b1.	Interpret data from each optical or electromagnetic systems	✓			✓		
	b2.	Assess according to beam reflection what is nature of surface and wave, and according to Electromagnetic induction what is the nature of source	✓	✓		✓		✓
	b3.	Design optical and electromagnetic system by logic way	✓			✓		✓
	b4.	compare between the use of microscope and telescope and lenses and mirrors and application	✓	✓		✓		✓
Practical and professional skills	c1.	Conduct some experiments using lenses in addition to mirrors and electric circuits.	✓		✓	✓		
	c2.	Analyze the out-pout data from optical and electromagnetic techniques	✓		✓	✓	✓	
	c3.	Apply the optical and electromagnetic phenomena in modern area applications	✓		✓	✓		✓
General Skills	d1.	Solve problems concerning to the course topics	✓	✓		✓	✓	✓
	d2.	Communicate to work efficiently in a team or separately	✓			✓		
	d3.	Collect data and wrighting reports in the different model and fields	✓			✓		✓

5. Students' Assessment Methods and Grading:

Tools	To Measure	Time schedule	Grading
Semester Work	a.1, a.2, b.1, b.2, c.1, c.2, d.1 and d.2	Fifth week	5 %
Mid-Term Exam	a.1, a.3, b.3, b.4, d.2, c.3, and d.3	Seventh week	5 %
Oral exam	a.1, a.3, b.2, b.3, b.4, c.3, and d.3	Fifteenth week	10 %
Written exam	All (ILOS)	Sixteenth week	80 %
Total			100 %

6. List of references:

6.1. Course notes

Lecture notes approved by Physics department.

6.2. Required books.

Fundamentals of Physics Extended, 9th Edition, David Halliday, Robert Resnick, Jearl Walker (2011)

6.3. Recommended books.

General Physics, 2nd Edition by Morton M. Sternheim and Joseph W. Kane, John Willy and sons. Inc, (1991)

6.4. Periodicals, Web sites, etc.

http://www. Physics2000
http://www. Physics today

7. Facilities required for teaching and learning:

Using a microphone in lectures
Using a black board
Group Discussions
Data show

Course coordinator:

Prof. Dr. Lotfy Abu-Salem
Prof. Dr. Saeed El-Sayed Abdel Ghany
Prof. Dr. Mohamed Abdel-Moneim
Dr. Salah Eid
Dr. Mahmoud Mokled

Head of the Department: Prof. Dr. Saeed El-Sayed Abdel Ghany
Date: 2022-2023

Course Specification

180Ch: Practical Chemistry (2)

A. Affiliation

Relevant program: B.Sc. in Geology Program
Department offering the program: Department of Geology
Department offering the course: Department of Chemistry
Academic year/level: first level

B. Basic information

Title: practical Chemistry (2)	**Code:** 180 Ch	**Year/level:** first level
Teaching Hours:	**Lectures:** 0	**Tutorial:** 0
	Practical: 3	**Total:**3 h/week

C. Professional information

1. Course Learning Objectives:

The objective of this course is to study the volumetric analysis (acid-base titration) and (oxidation –reduction titration). students learn the various methods to express the concentration of solution and he can prepare standard solution. They also learn the determination of unknown concentration using acid-base titration or oxidation – reduction titration. and physical properties of the unknown liquid such as color, odor and miscibility with water and identify the type of simple liquid organic compounds such as aromatic hydrocarbons and carboxylic acids and othersby general, distinction and confirmation experiments. Also, students can state the chemical composition of organic compounds.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Explain the different types of neutralization reaction in analytical chemistry.
a2. Describe the different units of concentration.
a3. know the requirement the primary standard solution.
a4. Recognize the different types of indictors in neutralization reaction.
a5. Identify physical and chemical properties of aromatic hydrocarbons " benzene, toluene".
a6. Describe physical and chemical properties of alcohols "methanol, ethanol and glycerol".
a7. Explain physical and chemical properties of aldehydes and ketones "formaldehyde, acetaldehyde, benzaldehyde and acetone".
a8. Outline physical and chemical properties of carboxylic acids "formic acid, acetic acid"**.**
a9. State physical and chemical properties of aromatic amines "aniline".
a10. Mention general scheme for identification of simple liquid organic compounds.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Analyze collected chemical data using some data processing skills.
b2. point out different concepts of neutralization reaction in analytical chemistry.
b3. Analyze chemical data to determine the concentration of unknown.

b4. Differentiate between the different compounds based on the recognition of the properties.
b5. Identify the compositions and chemical structures of organic compounds.
b6. Propose some reaction mechanisms for different chemical processes

c. Practical and professional skills:

On successful completion of the course, the student should be able to:

c1. perform standard laboratory procedures in neutralization reaction in analytical chemistry.
c2. Assess risk in laboratory work taking into consideration the specific hazards associated with the use of chemical materials as well as the safe and proper operation of the laboratory techniques.
c3. report observations and measurements of change of color of indicator in neutralization titration to determine the concentration of unknown.
c4. Perform standard laboratory procedures in organic chemistry.
c5. Assess risk in laboratory work taking into consideration the specific hazards associated with the use of chemical materials as well as the safe and proper operation of the laboratory techniques.
c6. Examine the physical and chemical properties of compounds.
c7. Report observations and results of different chemical properties

d. General skills:

On successful completion of the course, the student should be able to:

d1. Use computers and internet for communication, data handling and word processing.
d2. collaborate effectively with teamwork members to maintain independent and critical thinking, effective time-management and positive communication and cooperation with other members of the teamwork.
d3. effectively manage tasks, time and resources.
d4. Solve problems on the scientific basis taught in this course.
d5. Work in a team effectively, manage time, collaborate and communicate with others positively.
d6. Help raising public awareness of the benefits of conserving intellectual. property rights and scientific patents on the individuals and communities

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction to neutralization reactions with standardization of hydrochloric acid with sodium carbonate.			3
2. Titration of strong acid with strong base and weak acid with weak base.			3
3. Titration of strong acid with weak base and weak acid with strong base.			3
4. Titration of mix (sodium carbonate and sodium hydroxide) with hydrochloric acid			3
5. Titration of mix (sodium carbonate and sodium bicarbonate) with hydrochloric acid			3
6. Titration of mix (hydrochloric acid and phosphoric acid) with sodium hydroxide.			3
7. Titration of mix (acetic acid and phosphoric acid) with sodium hydroxide.			3

8. Aromatic hydrocarbons			3
9. Alcohols			3
10. Aldehydes and ketones			3
11. Carboxylic acids			3
12. Aromatic amines			3
13. General scheme for identification of simple liquid organic compounds			3
14. Revision			3
Total hours			**42**

4 - Teaching and Learning methods:

Intended Learning Outcomes			**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Knowledge & Understanding	a1.	Explain the different types of neutralization reaction in analytical chemistry.	✓	✓	✓	✓		✓
	a2.	Describe the different units of concentration.	✓	✓	✓	✓	✓	✓
	a3.	know the requirement the primary standard solution.	✓	✓	✓	✓		✓
	a4.	Recognize the different types of indictors in neutralization reaction.	✓	✓	✓	✓		✓
Knowledge & Understanding	a5.	Identify physical and chemical properties of aromatic hydrocarbons " benzene, toluene			✓	✓		✓
	a6.	Describe physical and chemical properties of alcohols "methanol, ethanol and glycerol".			✓	✓		✓
	a7.	Explain physical and chemical properties of aldehydes and ketones "formaldehyde, acetaldehyde, benzaldehyde and acetone".			✓	✓	✓	✓
	a8.	Outline physical and chemical properties of carboxylic acids "formic acid, acetic acid".			✓	✓	✓	✓
	a9.	State physical and chemical properties of aromatic amines "aniline".			✓	✓		✓
	a10.	Mention general scheme for identification of simple liquid organic compounds.			✓	✓	✓	✓
Intellectual Skills	b1.	Analyze collected chemical data using some data processing skills.		✓	✓	✓	✓	✓
	b2.	point out different concepts of neutralization reaction in analytical chemistry.	✓	✓	✓	✓	✓	✓

	b3.	Analyze chemical data to determine the concentration of unknown		✓	✓	✓	✓	✓
	b4.	Differentiate between the different compounds based on the recognition of the properties			✓	✓	✓	✓
	b5.	Identify the compositions and chemical structures of organic compounds.			✓	✓	✓	✓
	b6.	Propose some reaction mechanisms for different chemical processes.			✓	✓	✓	✓
Practical and professional skills	c1.	perform standard laboratory procedures in neutralization reaction in analytical chemistry.		✓	✓	✓		✓
	c2.	Assess risk in laboratory work taking into consideration the specific hazards associated with the use of chemical materials as well as the safe and proper operation of the laboratory techniques.		✓	✓	✓		✓
	c3.	Perform standard laboratory procedures in organic chemistry.			✓	✓	✓	✓
	c4.	Assess risk in laboratory work taking into consideration the specific hazards associated with the use of chemical materials as well as the safe and proper operation of the laboratory techniques.			✓	✓	✓	✓
	c5.	Examine the physical and chemical properties of compounds.			✓	✓	✓	✓
	c6.	Report observations and results of different chemical properties			✓	✓	✓	✓
General Skills	d1.	Use computers and internet for communication, data handling and word processing.		✓	✓	✓		✓
	d2.	collaborate effectively with teamwork members to maintain independent and critical thinking, effective time-management and positive communication and cooperation with other members of the teamwork.				✓		✓
	d3.	effectively manage tasks, time and resources.				✓		✓
	d4.	Use computers and internet for information and communication technology. effectively				✓		✓
	d5.	Solve problems on the scientific basis taught in this course.			✓	✓	✓	✓
	d6.	Work in a team effectively, manage time, collaborate and communicate with others positively.			✓	✓		✓

	d7.	Help raising public awareness of the benefits of conserving intellectual property rights and scientific patents on the individuals and communities.				✓		✓

5. Students' Assessment Methods and Grading:

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a3, b2, and d1	Fifth week	5 %
Mid-Term Exam	a1, a2, a3, a4, b2, d1, and d2	Seventh week	5 %
Oral exam	a1, a2, a3, a4, b1, b2, b3, c1, c2, and d4	Thirteenth week	10 %
Written exam	a1, a2, a3, a4, b1, b2, b3, c1, c2, d1, and d4	Fourteenth week	80 %
Total			100 %

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructor(s).

6.2. Required books.

J.D. Lee, Concise Inorganic Chemistry, 5th Edn. Blackwell Science, Australia, 1996.

6.3. Recommended books

1. F.A. Cotton, G. Wilkinson, C.A. Murillo, M. Bochmann, Advanced Inorganic Chemistry, 6th Edn, John Wiley&Sons, Inc., New York, 1999.

2. N.N. Greenwood, A. EarnShaw, Chemistry of Elements,2nd Edn, Butterworth Heinemann, USA 1997.

6.4. Periodicals, Web sites, etc.

Journal of *Chemical Education* (ACS)
Inorganic Chemistry (ACS)
http://www.public.asu.edu/~jpbirk/CHM-115_BLB/Chpt24/
http://ocw.mit.edu/courses/chemistry/5-112-principles-of-chemical-science-fall-2005/
http://www.docbrown.info/page07/appendixtrans11.htm

7. Facilities required for teaching and learning:

Using a microphone in lectures
Using of slit overhead projector
Using a black board
Group Discussions
Data show

Course coordinator: Dr. Shwekar Tawfik
Dr. Abdelmotaal A. El-Sheikh

Head of the Department: Prof. Dr. Wagdy Eldougdoug

Date: 2022-2023

Course Specification

180 Ph: Practical physics (1)

A. Affiliation

Relevant program: B.Sc. in Geology Program
Department offering the program: Department of Geology
Department offering the course: Department of Physics
Academic year/level: First level

B. Basic information

Title: Practical physics (1)	**Code:** 180 Ph	**Year/level:** First level
Teaching Hours:	**Lectures:** 0	**Tutorial: 0**
	Practical: 3	**Total:**3h/week

C. Professional information

1. Course Learning Objectives:

By Finishing of this course the graduate will able to understand the experimental method to identify and measure some physical quantity related to the properties of material and heat. Able to verify the physical lows. How to calculate the mathematical errors and use the suitable units. Work in teem to collect data and writing an assay. knows some applications of physics in the industry

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Recognize the concept of physical Quantity and physical phenomena.

a2. Investigate some physical lows.

a3. tell about the physical principles and experiments

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. compare between the applications of each physical apparatus.

b2. Interpret the output data from experimental systems.

b3. Construct simple systems to verify the physical lows

c. Practical and professional skills:

On successful completion of the course, the student should be able to.

c1. Sketch the practical data.

c2. Use the laboratory equipment and instrument

c3. Analyze data form each technique and tools considering scientific ethics.

d. General skills:

On successful completion of the course, the student should be able to.

d1. Solve problems and bulding experimental physical system.

d2. Communicate to work efficiently in a team or separately.

d3. Collect data and wrighting reports in the different physical topics.

3. Contents

No.	Topic	Lecture hours	Tutorial hours	Practical hours
1.	Introduction in the units, tools, Errors and Precise measurements			3
2.	Archimedes Experiment			3
3.	Newton law of cooling			3
4.	Specific heat of solid materials			3
5.	simple pendulum			3
6	Viscosity of liquid			3
7	**Mid-Term Exam**			3
8.	Melting point			3
9.	surface tension			3
10.	Hook law			3
11.	velocity of sound			3
12.	Joule experiment			3
13.	Linear Expansion			3
14.	Review and summary			3
Total hours				42

Intended Learning Outcomes			**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Knowledge & Understanding	a1.	Recognize the concept of physical Quantity and physical phenomena				✓	✓	
	a2.	Investigate some physical lows		✓		✓		✓
	a3.	tell about the physical principles and experiments			✓	✓	✓	
Intellectual	b1.	compare between the applications of each physical apparatus		✓		✓		

4.Teaching and Learning methods:

	b2.	Interpret the output data from experimental systems			✓	✓	✓	✓
	b3.	Construct simple systems to verify the physical lows			✓	✓		
Practical and professional skills	c1.	Sketch the practical data				✓	✓	
	c2.	Use the laboratory equipment and instruments				✓	✓	
	c3.	Analyze data form each technique and tools considering scientific ethics		✓	✓	✓		
General Skills	d1.	Solve problems and bulding experimental physical system.				✓	✓	✓
	d2.	Communicate to work efficiently in a team or separately			✓	✓		
	d3.	Collect data and wrighting reports in the different physical topics.		✓		✓	✓	✓

5. Students' Assessment Methods and Grading:

Tools	To Measure	Time schedule	Grading
Semester Work	a.1, a.2, a.3, b.1, b.2, c.1, c.2, d.1 and d.2	Fifth week	**5%**
Mid-Term Exam	a.1, a.3, b.2, b.3, c.3, and d.3	Seventh week	5%
Oral exam	a.2, a.3, b.2, b.3, c.3, and d.3	Thirteenth week	10%
Final practical exam	All (ILOS)	Fourteenth week	80%
Total			100 %

6. List of references:

6.1. Course notes

Practical notes approved by Physics department.

6.2. Required books.

The concepts and theories of modern physics by John Bernhard Stallo, BiblioBazaar (2009)

6.3. Recommended books.

Ancient and Modern Physics by Thomas E. Willson Hard Press Publishing (2010)

6.4. Periodicals, Web sites, etc.

http://www. Physics2000

http://www. Physics today

7. Facilities required for teaching and learning:

Using a microphone in lab
Using a black board
Group Discussions
Equipment

Course coordinator:
Prof. Dr. Mohamed Abdel-Moneim
Dr. Asmaa Gaber

Head of the Department: Prof. Dr. Saeed El-Sayed Abdel Ghany
Date: 2022-2023

Course Specification

181 Ch: Practical chemistry (1)

A. Affiliation

Relevant program: B.Sc. in Geology Program

Department offering the program: Department of Geology

Department offering the course: Department of Chemistry

Academic year/level: First level

B. Basic information

Title: Qualitative analysis for acidic and basic radicals of inorganic salts	**Code:**181Ch	**Year/level:** First level
Teaching Hours:	**Lectures:**0	**Tutorial:** 0
	Practical:3	**Total:**3 h/week

C. Professional information

1. Course Learning Objectives:

The objective of this course is to enable the students to understandthe classification of different groups of acidic and basic radicals of inorganic salts. Also, teach students how to identify unknown inorganic salts and how to separate between mixed basic radicals.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Investigate the qualitative analytical method for identifying different unknown salts.

a2. explain different classification of analytical chemistry.

a3. Name different inorganic salts.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Interpret the given chemical data to identify the unknown inorganic salts.

b2. Differentiate between different types of acidic and basic radicals.

b3. Apply the qualitative analytical procedures to identify acidic and basic radicals of unknown salts.

c. Practical and professional skills:

On successful completion of the course, the student should be able to:

c1. investigate the acidic and basic radicals of unknown inorganic salts.

c2. identify and distinguish between different mixed basic radicals.

d. General skills:

On successful completion of the course, the student should be able to:

d1. Use computers and internet for information and communication technology. effectively.
d2. Solve problems on the scientific basis taught in this course.
d3. Work in a team effectively, manage time, collaborate, and communicate with others positively.
d4. Help raising public awareness of the benefits of conserving intellectual. property rights and scientific patents on the individuals and communities.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction to qualitative analysis and the classification of different groups of acidic and basic radicals.			3
2. Qualitative analysis for gp (I) of acidic radicals.			3
3. Qualitative analysis for gp (II) of acidic radicals.			3
4. Qualitative analysis for gp (III) of acidic radicals.			3
5. Oral exam.			3
6. Qualitative analysis for gp (I) of basic radicals.			3
7. Qualitative analysis for gp (II) of basic radicals.			3
8. Qualitative analysis for gp (III) of basic radicals.			3
9. Qualitative analysis for gp (IV) of basic radicals.			3
10. Qualitative analysis for gp (V) of basic radicals.			3
11. Qualitative analysis for gp (VI) of basic radicals.			3
12. Revision1			3
13. Revision2			3
14. Revision3			3
Total hours			**42**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Problem solving	Brain storming
Knowledge & Understanding	a1.	Investigate the qualitative analytical method for identifying different unknown salts.	✓		✓		✓
	a2.	explain different classification of analytical chemistry.	✓				
	a3.	Name different inorganic salts.	✓		✓	✓	✓
Intellect	b1.	Interpret the given chemical data to identify the unknown inorganic salts.	✓		✓	✓	✓

	b2.	Differentiate between different types of acidic and basic radicals.	✓		✓	✓	✓
	b3.	Apply the qualitative analytical procedures to identify acidic and basic radicals of unknown salts.	✓		✓	✓	✓
Practica l and professi	c1.	Investigate the acidic and basic radicals of unknown inorganic salts.	✓		✓	✓	✓
	c2.	Identify and distinguish between different mixed basic radicals.	✓		✓	✓	✓
General Skills	d1.	Use computers and internet for information and communication technology effectively.	✓				✓
	d2.	Solve problems on the scientific basis taught in this course.	✓		✓	✓	✓
	d3.	Work in a team effectively, manage time, collaborate and communicate with others positively.	✓		✓		✓
	d4.	Help raising public awareness of the benefits of conserving intellectual property rights and scientific patents on the individuals and communities.	✓				✓

5- Students' Assessment Methods and Grading:

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a3, b2, d1 and d3	Fifth week	10 %
Oral exam	a1, a2, a3, b2, d1, and d2	Seventh week	10%
Practical exam	a1, a2, a3, b1, b2, b3, c1, c2, and d4	Thirteenth week	80 %
Written exam	a1, a2, a3, a4, a5, b1, b2, b3, c1, c2, d1, and d4	Fourteenth week	80 %
Total			100 %

6. List of references:

6.1. Course notes

Lecture note approved by Department of Chemistry.

6.2. Required books.

Zumdahl, S. S. *Chemical Principles, 4th Ed.*; Houghton-Mifflin: New York, 2002, chapter 8.

6.3. Recommended books

1-Wismer, Robert K. *Qualitative Analysis with Ionic Equilibrium*; Macmillan Publishing Company: New York, 1991.

6.4. Periodicals, Web sites, etc.

Journal of *Chemical Education* (ACS)
Inorganic Chemistry (ACS)

http://www.public.asu.edu/~jpbirk/CHM-115_BLB/Chpt24/
http://ocw.mit.edu/courses/chemistry/5-112-principles-of-chemical-science-fall-2005/
http://www.docbrown.info/page07/appendixtrans11.htm

7. Facilities required for teaching and learning:

Using a microphone in lectures
Using of slit overhead projector
Using a black board
Group Discussions
Data show

Course coordinator:	Prof. Dr. Mohamed Hekal
	Prof. Dr. Mostafa Yassin Nassar
	Prof. Dr. Eman Abdullah
	Prof. Dr. Sabry Hamed
	Prof. Dr. Maher El-Naggar
Head of the Department:	Prof. Dr. Wagdy Eldougdoug
Date:	2022-2023

Course Specification
181 Ph: Practical physics (2)

A. Affiliation

Relevant program:	B.Sc. in Geology Program
Department offering the program:	Department of Geology
Department offering the course:	Department of Physics
Academic year/level:	First level

B. Basic information

Title: Practical physics (2)	**Code:** 181 Ph	**Year/level:** First level
Teaching Hours:	**Lectures:** 0	**Tutorial: 0**
	Practical: 3	**Total:**3h/week

C. Professional information

1. Course Learning Objectives:

By Finishing of this course the graduate will able to
Understand the experimental method to identify and measure some physical quantity related to the electricity-magnetism and optics. Able to verify the physical lows. How to calculate the mathematical errors and use the suitable units. Work in teem to collect data and writing an assay. knows some applications of physics in the industry

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Recognize the concept of physical Quantity and physical phenomena.

a2. memorize some physical laws.

a3. tell about the physical principles and experiments.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Compare between the applications of each physical apparatus.

b2. Analyze the output data from experimental systems.

b3. Construct simple systems to verify the physical low

c. Practical and professional skills:

On successful completion of the course, the student should be able to.

c1. Sketch the practical data.

c2. Identify the measuring method and system

c3. Apply techniques and tools considering scientific ethics.

d. General skills:

On successful completion of the course, the student should be able to.

d1. Solve problems and bulding experimental physical system.

d2. Communicate to work efficiently in a team or separately.

d3. Collect data and wrighting reports in the different physical topics.

3. Contents

No.	Topic	Lecture hours	Tutorial hours	Practical hours
1.	Introduction in the units, tools, Errors and Precise measurements			3
2.	Ohm's Law			3
3.	The Metric Bridge			3
4.	The tangent galvanometer			3
5.	Meld's experiment			3
6	Comparison of magnetic moment			3
7	**Mid-Term Exam**			3
8.	Concave Mirror			3
9.	Convex Lens			3
10.	Concave Mirror			3
11.	Convex Lens			3
12.	Newton's formula of the lenses			3
13.	Verification of Kirchhoff's law			3
14.	Review and summary			3
	Total hours			**42**

Intended Learning Outcomes			**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Knowledge & Understanding	a1.	Recognize the concept of physical Quantity and physical phenomena				✓	✓	
	a2.	memorize some physical lows				✓		✓
	a3.	tell about the physical principles and experiments			✓	✓	✓	

4. Teaching and Learning methods:

Intellectual Skills	b1.	Compare between the applications of each physical apparatus				✓		
	b2.	Analyze the output data from experimental systems			✓	✓	✓	✓
	b3.	Construct simple systems to verify the physical lows				✓		
Practical and profession	c1.	Sketch the practical data				✓	✓	
	c.2	Identify the measuring method and system			✓	✓	✓	
	c.3	Apply techniques and tools considering scientific ethics			✓	✓		
General Skills	d.1	Solve problems and bulding experimental physical system.				✓	✓	✓
	d.2	Communicate to work efficiently in a team or separately			✓	✓		
	d.3	Collect data and wrighting reports in the different physical topics			✓	✓	✓	✓

5. Students' Assessment Methods and Grading:

Tools:	To Measure	**Time schedule**	**Grading**
Semester Work	a.1, a.2, a.3, b.1, b.2, c.1, c.2, d.1 and d.2	Fifth week	**5%**
Mid-Term Exam	a.1, a.3, b.2, b.3, d.2, c.3 and d.3	Seventh week	5%
Oral exam	a.2, a.3, b.2, b.3, c.3 and d.3	Thirteenth week	10%
Final practical exam	All (ILOS)	Fourteenth week	80%
Total			100 %

6. List of references:

6.1. Course notes

Practical note approved by Physics department.

6.2. Required books.

Fundamentals of Physics Extended, 9th Edition, David Halliday, Robert Resnick, Jearl Walker (2011)

6.3. Recommended books.

6.4. Periodicals, Web sites, etc.

http://www. Physics2000

http://www. Physics today

7. Facilities required for teaching and learning:

Using a microphone in Lab
Using a black board
Group Discussions
Equpmints

Course coordinator:
Prof. Dr. Mohamed Abdel-Moneim
Dr. Asmaa Gaber

Head of the Department: Prof. Dr. Saeed El-Sayed Abdel Ghany
Date: 2022-2023

Course Specification
203 G: Survey

A. Affiliation

Relevant program: **B.Sc. in Geology Program**
Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Second level**

B. Basic information

Title: Survey	**Code:203G**	**Year/level:** second level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course is designed to introduce students to fundamentals and methods of survey and applications in different fields. The students are expected to investigate devices and tools used in survey methods, and work on projects in the survey field.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

a1. Recoginze the role of survey in geological and engineering applications.
a2. Identify the survey problem and ways to solve.
a3. Characterize each type of the tools and methods used in geological and civil survey applications.
a4. Realizehow survey is important for land use and town planning.

b. Intellectual skills:

On successful completion of the course, the student should be able to

b1. Organize the project and set up a survey plan.
b2. Decide which survey method and tools are to be used.
b3. Analyze the various projection results for a 3-D body.
b4. Investigate the distribution of points, elevations, altitude and positioning problems.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. Analyze survey measurements and plan a project.
c2. Use the survey tools in mapping buildings and mountains.
c3. Draw interpretations of survey measurements and projections.

d. General skills:

On successful completion of the course, the student should be able to:

d1. Review available literature and study the area.
d2. Interpret measurements using software to write a report.

d3. Apply knoweldge and training in survey problems.
d3. Working a group and manage time and effort.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction and definitions	2		2
2. Construction and mining survey	4		4
3. Cartography and survey	4		4
4. Types of deviations	4		4
5. Survey methods and techniques	4		4
6. Survey tools	4		4
7. Applications in Geology and Engineering	4		4
8. Revision and feedback	2		2
Total hours	**28**		**28**

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	Recognize the role of survey in geological and engineering applications.	✓					
	a2.	Identify the survey problem and ways to solve.		✓	✓			
	a3.	Characterize each type of the tools and methods used in geological and civil survey applications.	✓	✓	✓			
	a4.	Demonstrate how survey is important for land use and town planning.	✓				✓	✓
Intellectual Skills	b1.	Organize the project and set up a survey plan.			✓	✓		
	b2.	Decide which survey method and tools are to be used.	✓					
	b3.	Analyze the various projection results for a 3-D body.				✓	✓	✓
	b4.	Investigate the distribution of points, elevations, altitude and positioning problems.	✓	✓	✓	✓		
Practical and professional skills	c1.	Analyze survey measurements and plan a project.		✓				
	c2.	Use the survey tools in mapping buildings and mountains.	✓	✓	✓			

	c3.	Draw interpretations of survey measurements and projections.				✓	✓	
General Skills	d1.	Review available literature and study the area.	✓				✓	✓
	d2.	Interpret measurements using software to write a report.				✓		
	d3.	Apply knoweldge and training in survey problems.	✓			✓		
	d4.	Work in a group and manage time and effort.				✓	✓	

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude.
5.2. Assignments to assess the student independent work.
5.3. Written mid-term exam to ensure the student progress and discover the shortage.
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs b, c	Thirteenth week	24 %
Oral exam	ILOs b, c	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

Contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and definitions	x						x						x			
Construction and mining survey		x				x					x					x
Cartography and survey				x												
Types of deviations			x													
Survey methods and techniques				x										x		
Survey tools						x				x						
Applications in Geology and Engineering		x						x						x		
Revision and feedback																

6- List of references:

6.1. Course notes
Lecture notes prepared by the course instructor(s)
Power point presentations

6.2. Required books.
None

6.3. Recommended books
Land Surveyor Reference Manual, 4th edition by Andrew. L. Harbin
6.4. Periodicals, Web sites, etc.
None

7. Facilities required for teaching and learning:
Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinator:	Prof. Dr. Refaat Osman
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419) updated on 2022/2023

Course Specification
205 G: Hydrology

A- Affiliation

Relevant program: **B.Sc. in Geology Program**

Department offering the program:	**Department of Geology**
Department offering the course:	**Department of Geology**
Academic year/level:	**Second level**
Course coordinator:	**Prof. Dr. Mohamed El-Fakharany**

B - Basic information

Title: Hydrology	**Code:205G**	**Year/level:** second level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical: 2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is aimed at introducing students to principles of the hydrology, and to train students on recognition of the main concepts of water quality.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should be able to:

a1. approach and solve basic problems in the field of hydrology,
a2. explore locations of hydrology data and how to use them in hydrologic investigations,
a3. realize how hydrology is interrelated with other natural and environmental science disciplines,
a4. recognize the methods and techniques used in interpetation of the hydrology data.

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1. Investigate the distribution undergroundwater.
b2. Analyze hydrologic processes, particularly the processes of precipitation, evaporation, infiltration, and runoff.
b3. explore methods of hydrologic analysis, including aquifer types, chemical constituents of groundwater
b4. Evaluate Water for different uses.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. acquire substantial quantities of information, process it effectively, and draw appropriate conclusions,
c2. report accurate observations and measurements,
c3. Analyze the Rock types and quality of groundwater,

c4. Carry out scientific research and evaluate and make use of the material so acquired,

d - General skills:

On successful completion of the course, the student should be able to:

d1. Work productively with others,
d2: Communicate effectively in writing,
d3. Organize and manage working time, schedule tasks, and meet deadlines,
d4. Use computer, internet & communications.
d5. Adhere to ethical and community linked thinking.

3 – Contents

Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
1. Introduction and course description	2	0	2
2. Water in nature, water types, The hydrologic cycle	2	0	2
3. Forms and types of precipitation	2	0	2
4. Evaporation – Transpiration	2	0	2
5. Surface Runoff and types of drainage basins	2	0	2
6- Groundwater-Vertical distribution of groundwater-aquifer types	2	0	2
7- Physical and chemical properties of water	2	0	2
8- Electrical properties of water, Total Dissident Solids-Water Hardness	2	0	2
9- Chemical constituents of groundwater	2	0	2
10- Dissolved Gases-Biological Character of Groundwater-Radioactive Material of Groundwater	2	0	2
11- Rock types and quality of groundwater	2	0	2
12- Evaluation of Water for different uses	2	0	2
13- water pollution, causes, sources and negative effects	2	0	2
14- Revision and Feedback	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	approach and solve basic problems in the field of hydrology,	√					
	a2	explore locations of hydrology data and how to use them in hydrologic investigations,		√		√		
	a3	realize how hydrology is interrelated with other natural and environmental science disciplines,	√	√	√	√		
	a4	recognize the methods and techniques used in interpetation of the hydrology data.,	√			√		
Intellectual Skills	b1	investigate the distribution and migration of undergroundwater.	√			√		
	b2	analyze hydrologic processes, particularly the processes of precipitation, evaporation, infiltration, and runoff.			√	√		
	b3	explore methods of hydrologic analysis, including aquifer types, chemical constituents of groundwater	√			√		√
	b4	Evaluate Water for different uses.	√	√				√
Practical and professional skills	c1	acquire substantial quantities of information, process it effectively, and draw appropriate conclusions,	√			√		
	c2	make and record accurate observations and measurements,	√			√	√	
	c3	Analyze the Rock types and quality of groundwater		√		√		
	c4	analyze the various geological and structural issues of aquifers,				√		
	c5	Carry out scientific research and evaluate hydrogeologic issues.						
General Skills	d1	work productively with others,	√		√	√		
	d2	communicate effectively in writing,	√				√	√
	d3	organize and manage working time, schedule tasks, and meet deadlines,						√
	d4	Use computer, internet & communications.				√		
	d5	adhere to ethical and community linked thinking			√	√		

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course description	x						x						x			
Water in nature, water types, The hydrologic cycle		x				X					x					x
Forms and types of precipitation				x												
Evaporation – Transpiration			x													
Surface Runoff and types of drainage basins				x										x		
Groundwater-Vertical distribution of groundwater-aquifer types						X				x						
Physical and chemical properties of water		x						x						x		
Electrical properties of water, Total Dissident Solids-Water Hardness			x										x			
Chemical constituents of groundwater		x							x						x	
Dissolved Gases-Biological Character of Groundwater-Radioactive Material of Groundwater	x						x					x		x		

Rock types and quality of groundwater			x			X							x			
Evaluation of Water for different uses		x								x					x	
Water pollution, causes, sources and negative effects		x														x
Revision and Feedback																

6- List of references:

6-1 Course notes

Course notes prepared by the course instructor(s) and approved by the Department council.

6-2 Required books.

None

6-5 Recommended books

Hydrology Principles, Analysis, Design Revised 2nd edition Author: H. M. Raghunath Copyright © 2006 New Age International (P) Ltd., Publishers Published by New Age International (P) Ltd., Publishers pages 463.

Basic ground-water hydrology (1987) By RALPH C. HEATH Library of Congress Cataloging in Publication Data Geological Survey water-supply paper; 2220.

Study and interpretation of the chemical characteristics of natural water by Hem, J. D., 1985, 3 ed., U.S. Geol. Surv. Water Supply, paper No 2254, 263 p.

6-6 Periodicals, Web sites, etc.

www.google.com & www.scincedirect.com

7- Facilities required for teaching and learning:

Data show: Power point presentations

Sound system to ensure the ease listening

Using a blackboard

Course coordinator: Prof. Dr. Mohamed El-Fakharany / Dr. Nehad Mahmoud

Head of the Department: Prof. Dr. Gamal El Qot

Date: 2022/2023

Course Specification
210-G: Litho- and Biostratigraphy

A- Affiliation

Relevant program: Geology B.Sc. Program
Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Second level

B - Basic information

Title: Litho- and Biostratigraphy	**Code:210-G**	**Year/level:** second level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical: 2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

- The objectives of this course are to enable the students to identify the difference between the lithostratigraphy, biostratigraphy and chronostratigraphy.
- To investigate the modern stratigraphic classification
- To explain the stratigraphic procedures, relationships and stratigraphic correlation.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should be able to:

a1- differentiate between the different types of the stratigraphy.
a2- identify the main principles of stratigraphy.
a3- recognize the different stratigraphic relationships and stratigraphic correlation.
a4- identify the various kinds of the index fossils.
a5- identify the standard biozones of the phanerozoic of Egypt and their various kinds.

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- solve the stratigraphic problems and deduce the data of the rock unit's correlation.
b2- design the fossil tool in description the environmental condition.
b3- identify the most common standard biozones of the phanerozoic.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1- draw the stratigraphic sections and correlate between the different rock units.
c2- differentiate the various kinds of biozones of some exposed rock stages and correlate them with some neighboring countries.
c3- interpret the litho-, biostratigraphic data.
c4- differentiate between the different lithostratigraphic units in the field.

d - General skills:

On successful completion of the course, the student should be able to:

d1- Use computer, internet & communications.

d2- Management, working in group & life-long learning.

d3- Ethical behavior, community linked thinking.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction to stratigraphy	2	0	2
2- The stratigraphic principles	2	0	2
3- Modern stratigraphic classification	2	0	2
4- The geologic time scale	2	0	2
5- The stratigraphic procedures	2	0	2
6- The stratigraphic relationships	2	0	2
7- The stratigraphic correlation	2	0	2
8- Introduction to biostratigraphy	2	0	2
9- The principles of biostratigraphy	2	0	2
10- The biozones and correlation using the index fossils	2	0	2
11- Methods of geological dating using index fossils and radiometric methods	2	0	2
12- The most common biozones through the Paleozoic	2	0	2
13- The most common biozones through the Mesozoic	2	0	2
14- The most common biozones through the Cenozoic	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Knowledge & Understanding	a1	differentiate between the different types of the stratigraphy.	x	0	x	0	0	x
	a2	identify the main principles of stratigraphy.	x	x	0	0	0	0
	a3	recognize the different stratigraphic relationships and stratigraphic correlation.	x	0	0	0	0	x
	a4	identify the various kinds of the index fossils.	x	x	0	0	X	x
	a5	identify the standard biozones of the phanerozoic of Egypt and their various kinds.	x					

Intellectual Skills	b1	solve the stratigraphic problems and deduce the data of the rock unit’s correlation.	**x**	0	0	**0**	**X**	**0**
	b2	design the fossil tool in description the environmental condition.	**x**	0	0	**0**	**x**	**x**
	b3	identify the most common standard biozones of the phanerozoic.	x	0	0	**0**	**X**	**0**
Practical and professional skills	c1	draw the stratigraphic sections and correlate between the different rock units.	x	0	0	0	X	x
	c2	differentiate the various kinds of biozones of some exposed rock stages and correlate them with some neighboring countries.	x	0	0	0	X	x
	c3	interpret the litho-, biostratigraphic data.	x	0	0	0	x	x
	c4	differentiate between the different rock units in the field						
General Skills	d1	Use computer, internet & communications.	x	x	0	0	0	x
	d2	Management, working in group & life-long learning.	x	x	o	o	o	x
	d3	Ethical behavior, community linked thinking.	x	x	o	o	x	x

5- Students’ Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude.
5.2. Assignments to assess the student independent work,
5.3. A field trips.
5.4. Written mid-term exam to ensure the student progress and discover the shortage.
5.5. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a4, b1, b2, c1, d1	Fifth week	5 %
Mid-Term Exam	a1, a2, b1, b2, c1	Seventh week	5 %
Oral exam	a1, a2, a3, a4, b5, b1, c2, c3	Thirteenth week	10 %
Written exam	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, c2, c3, and c4.	Fourteenth week	80 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to stratigraphy	x						x						x			
The Stratigraphic principles		x				X					x					x

Modern stratigraphic classification				x												
The stratigraphic time scale			x													
The stratigraphic procedures				x										x		
The stratigraphic relationships						X				x						
The stratigraphic correlation		x						x						x		
Introduction to Biostratigraphy			x										x			
The principles of biostratigraphy		x							x						x	
The Biozones and correlation using the Index fossils	x						x					x		x		
Methods of Geological dating using index fossils and radiometric methods			x			X							x			
The most common biozones through the Paleozoic		x								x					x	
The most common biozones through the Mesozoic		x														x
The most common biozones through the Cenozoic			x											x		

6- List of references:

6-1 Course notes

Manual notes handle of Litho-, Biostratigraphy for students.

6-2 Required books.

none

6-7 Recommended books

1.Text book: Stratigraphy and sedimentation

Author:

2. Text book: Sedimentary Structures.

Author: Collinson, J. D. & Thompson, D. B. 1982.

3. Text book: Biostratigraphy: Microfossils and Geological Time

Author: Brian McGowran

Publisher: Cambridge University Press; 1 edition (January 1, 2008), 480 pages

6-8 Periodicals, Web sites, etc.

www.sciencedirect.com&www.geology.com

7- Facilities required for teaching and learning:

Data show
Using a blackboard
Group discussions

Course coordinators:	Prof. Dr. Gamal El Qot
Head of the Department:	Prof. Dr. Dr. Gamal El Qot
Date:	Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419) updated on 2022/2023

Course Specification
215-G: Invertebrate Paleontology

Relevant program: **B.Sc. in Geology**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Second level**

B - Basic information

Title: Invertebrate Fossils	**Code:215G**	**Year/level:** Second level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is designed to introduce students to the principles of faunal interpretation as applied to the fossil record of the invertebrate phyla.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a1.provide an overview of fundamental paleontologic principles such as thenature of fossils and the fossil record, concepts of organic evolution, methods ofclassification, biostratigraphy and paleoecology,

a2. review the morphology, classification, life environments, and ranges ofimportant invertebrate fossil groups,

a3. demonstrate the basic paleontologic skillsrequired for more advanced paleontologic and litho and biostratigraphy.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. differentiate between different types of fossil types,

b2.determine the stratigraphic units based on their funal content,

b3.demenostsate the basic and progressed techniques and methods stratigraphy,

b4.recognize the different formations based on their stratigraphic setting.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. recognize the fossils and class of a given bed,

c2.analyze the stratigraphic units and fossils,

c3.use the fossil content to identify formations and their properties,

c4.apply the investigation results for bed classification and distinctions.

d - General skills:

On successful completion of the course, the student should be able to:

d1. collect data from sample examination and other data resources,

d2. reproduce the results to meet the projected goals in an easy, readable final form,

d3. collaborate and work in team smoothly adhere to ethics and manage time.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction to invertebrate fossils	2	0	2
2- Phylum Porifera	2	0	2
3- Phylum Cnidaria	2	0	2
4- Phylum Brachiopoda	2	0	2
5- Phylum Mollusca	2	0	2
6- Class Bivalvia	2	0	2
7- Class Gastropoda	2	0	2
8- Class Cephalopoda	2	0	2
9- Phylum Echinodermata	2	0	2
10- Class Echinoidea	2	0	2
11- Phylum Arthropoda	2	0	2
12- Phylum Hemichordata	2	0	2
13- Applications into the geology of Egypt	2	0	2
14- Revision and course evaluation/open session	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lectures	Presentations	Discussions	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	provide an overview of fundamental paleontologic principles such as thenature of fossils and the fossil record, concepts of organic evolution, methods ofclassification, biostratigraphy and paleoecology,	√			√		
	a2	review the morphology, classification, life environments, and ranges ofimportant invertebrate fossil groups,	√	√		√		
	a3	demonstrate the basic paleontologic skills required for more advanced paleontologic and litho and biostratigraphy.		√		√		
Intellectual Skills	b1	differentiate between different types of fossil types,	√	√		√		
	b2	determine the stratigraphic units based on their funal content,				√		√
	b3	demenostsate the basic and progressed techniques and methods stratigraphy,	√	√		√		
	b4	recognize the different formations based on their stratigraphic setting.	√	√			√	

Practical and professional skills	c1	recognize the fossils and class of a given bed,		√		√		
	c2	analyze the stratigraphic units and fossils,				√		
	c3	use the fossil content to identify formations and their properties,			√	√		√
	c4	apply the investigation results for bed classification and distinctions.	√				√	√
General Skills	d1	collect data from sample examination and other data resources,				√		
	d2	reproduce the results to meet the projected goals in an easy, readable final form,				√	√	√
	d3	collaborate and work in team smoothly adhere to ethics and manage time.	√			√		

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exams to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semesterwork	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to Invertebrate fossils	x						x						x			
Phylum Porifera		x				x					x					x
Phylum Cnidaria				X												
Phylum Brachiopoda			X													
Phylum Mollusca				X										x		
Class Bivalvia						x				x						
Class Gastropod		x						X						x		
Class Cephalopoda			X										x			
Phylum Echinodermata		x							x						x	
Class Echinoidea	x						x					x		x		
Phylum Arthropoda			X			x							x			
Phylum Hemichordata		x								x					x	

Applications into the geology of Egypt		x														x
Revision and course evaluation/open session			X											x		

6- List of references:

6-1 Course notes

Power point presentations

6-2 Required books.

none

6-9 Recommended books

1.Text book: Fossils at a Glance
Author: Clare Milsom
Liverpool John Moores University Sue Rigby University of Edinburgh
Second edition 2010
2. Text book: Fossil invertebrates
Author: Boardman, R. S., Cheetham1987.
3.Text book: Invertebrate paleontology and Evolution
Author: Clarkson, E. N. K., 1986.

6-10 Periodicals, Web sites, etc.

http://www.palaeos.comwww.cmnh.org/site/researchandcollections_InvertebratePaleontology.aspx
http://www.webpages.uidaho.edu/~mgunter/opt_min/article.pdf

7- Facilities required for teaching and learning:

Power point presentations
Data show
Sound system to ensure the ease listening
Group discussions

Course coordinator: Prof. Dr. Gamal El Qot

Head of the Department: Prof. Dr. Gamal El Qot
Date: Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419) updated on 2022/2023

Course Specification

216 G: Micropalaentology

A. Affiliation

Relevant program: **B. Sc.in Geology Program**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Second level**

B. Basic information

Title: Micropalaentology	**Code: 216G**	**Year/level: Second level**
Teaching Hours:	**Lectures:** 2	**Tutorial: 0**
	Practical:2	**Total:**4h/week

C. Professional information

1. Course Learning Objectives:

This course aims to deliver a theoretical and practical understanding of how graduates can understand microfossils, their size, characters and range. Detailed investigation and examination of fossilized protistan life forms that are most commonly used in evolutionary studies applicable to biostratigraphy, paleoceanography, and global climate change.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

a1.provide an overview of fundamental paleontologic principles such as the nature of fossil record, concepts of organic evolution, methods of classification, biostratigraphy and paleoecology,

a2.review the morphology, classification, life environments, and ranges of important microfossil groups,

a3.demonstrate the basic paleontologic skills required for more advanced paleontology,litho and biostratigraphy.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. differentiate between different types of microfossils.

b2. determine the types of microfossils.

b3.demenostsate the basic and progressed techniques and methods in micropalenotology.

b4. Application of these microfossils in the fields of oil-exploration.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. recognize the fossil content a given bed,

c2. analyze the kinds of a microfossils,

c3. use the microscope and identify microfossils and their properties,
c4. apply the investigation results for classification and distinctions.

d. General skills:

On successful completion of the course, the student should be able to:

d1. collect data from sample examination and other data resources,
d2. reproduce the results to meet the projected goals in an easy, readable final form,
d3. collaborate and work in team smoothly adhere to ethics and manage time.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction and course description	2	0	2
2. Foraminiferal general history	2	0	2
3. Benthic and planktic foraminifera	2	0	2
4. Foraminiferal application in the stratigraphy.		0	
5. Morphology of ostracods.	2	0	2
6. Ostracods distribution and ecology.	2	0	2
7. Recognition of nannoplankton (coccoliths).	2	0	2
8. Living coccoliths and their ecology and classification.		0	
9. General history of calcareous nannofossils and application in stratigraphy and paleoclimatology.	2	0	2
10. Diatom: living diatom, structure and morphological characteristics, diatom symmetry, ornamentation and taxonomy.	2	0	2
11. Radiolaria: distribution and ecology, sedimentation and dissolution, classification, and geologic record and applications.	2	0	2
12. Dinoflagellates: Living dinoflagellate and its life history, Ecology, classification, dinoflagellate stratigraphic position and applications.	2	0	2
13. Explanation the role of microfossils in paleoenvironmental interpretation.	2	0	2
14. Revision and course evaluation/open session	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	provide an overview of fundamental paleontologic principles such as the nature of fossil record, concepts of organic evolution, methods of classification, biostratigraphy and paleoecology,	✓	✓		✓		
	a2.	review the morphology, classification, life environments, and ranges of important microfossil groups,	✓	✓		✓	✓	✓
	a3.	demonstrate the basic paleontologic skills required for more advanced paleontology, litho and biostratigraphy.	✓	✓		✓	✓	✓
Intellectual Skills	b1.	differentiate between different types of microfossils,	✓	✓		✓	✓	✓
	b2.	determine the types of microfossils,	✓			✓		
	b3.	demenostsate the basic and progressed techniques and methods in micropalenotology,	✓	✓		✓	✓	
	b4.	Application of these microfossils in the fields of oil-exploration.	✓	✓	✓	✓		
Practical and professional skills	c1.	recognize the fossil content a given bed,		✓	✓		✓	
	c2.	analyze the kinds of a microfossils,	✓	✓	✓			
	c3.	use the microscope and identify microfossils and their properties,	✓		✓		✓	
	c4.	apply the investigation results for classification and distinctions.	✓		✓	✓		✓
General Skills	d1.	collect data from sample examination and other data resources,	✓	✓	✓	✓		
	d2.	reproduce the results to meet the projected goals in an easy, readable final form,	✓	✓		✓		
	d3.	collaborate and work in team smoothly adhere to ethics and manage time.	✓	✓		✓	✓	✓

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exams to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course description	x						x						x			
Foraminiferal general history		x				x					X					x
Benthic and planktic foraminifera				x												
Foraminiferal application in the stratigraphy.			x													
Morphology of ostracods.				x										x		
Ostracods distribution and ecology.						x				x						
Recognition of nannoplankton (coccoliths).		x						x						x		
Living coccoliths and their ecology and classification.			x										x			
General history of calcareous nannofossils and application in stratigraphy and paleoclimatology.		x							x						x	
Diatom: living diatom, structure and morphological characteristics, diatom symmetry, ornamentation and taxonomy.	x						x					x		x		
Radiolaria: distribution and ecology, sedimentation and dissolution, classification, and geologic record and applications.			x			x							x			

Dinoflagellates: Living dinoflagellate and its life history, Ecology, classification, dinoflagellate stratigraphic position and applications.		x								x					x	
Explanation the role of microfossils in paleoenvironmental interpretation.		x														x
Revision and course evaluation/open session			x											x		

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructor(s)approved by the department council.

6.2. Required books.

None

6.3. Recommended books

William Nesse 2012 Introduction to Optical Mineralogy
Oxford University Press; Fourth Edition (March 31, 2012) 368 pages,
William Nesse 2012 Introduction to mineralogy, Oxford University Press; 2 edition (August 8, 2011) 496 pages

6.4. Periodicals, Web sites, etc.

http://www.xtal.iqfr.csic.es/Cristalografia/parte_03-en.html
http://www.webpages.uidaho.edu/~mgunter/opt_min/article.pdf
http://dave.ucsc.edu/myrtreia/crystal.html

7. Facilities required for teaching and learning:

Power point presentations
Data show
Sound system to ensure the ease listening
Group discussions

Course coordinator: Prof. Hassan El Sheikh
Dr. Fatma Shaker
Dr. Mohamed El Beshtway

Head of the Department: Prof. Dr. Gamal El Qot

Date: Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419) updated on 2022/2023

Course Specification

219G: Fossilization and Plant Fossils

A- Affiliation

Relevant program: **B. Sc.in Geology**
Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Second level**

B - Basic information

Title: Fossilization and plant fossils	**Code:219G**	**Year/level: Second level**
Teaching Hours:	**Lectures:**2 **Practical:2**	**Tutorial: 0** **Total:**4 **h/week**

C - Professional information

2 – Course Learning Objectives:

This course aims to deliver a theoretical and practical understanding of how graduates recognize of fossilization and plant fossils, their size, characters and range. Detailed investigation and examination of fossilized protistan life forms that are most commonly used in evolutionary studies applicable to biostratigraphy, paleoceanography, and global climate change.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a1.provide an overview of fundamental paleontologic principles such as the nature of fossils and the fossil record, concepts of organic evolution, methods of classification, biostratigraphy and paleoecology,

a2. review the morphology, classification, life environments, and ranges of important invertebrate fossil groups,

a3. demonstrate the basic paleontologic skills required for more advanced paleontologic and litho and biostratigraphy,

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. differentiate between different types of fossils forms,

b2. determine the symmetry elements of fossils line materials,

b3.demenostsate the basic and progressed techniques and methods in fossils,

b4.recognize the different beds based on their properties.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. recognize the fossils system and class of a given bed,
c2. analyze the symmetrical elements of a fossilsline material,
c3. use the microscope and identify beds and their fossils properties,
c4.apply the investigation results for bed classification and distinctions.

d - General skills:

On successful completion of the course, the student should be able to:

d1. collect data from sample examination and other data resources,
d2. reproduce the results to meet the projected goals in an easy, readable final form,
d3. collaborate and work in team smoothly adhere to ethics and manage time.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction and course description	2	0	2
2- Fossils, fossilization process, conditions promote fossilization	2	0	2
3- Types of fossils	2	0	2
4- Classification of organisms, bases of classification of fossils	2	0	2
5- Binomial Nomenclature	2	0	2
6- Plant-fossils through geologic record	2	0	2
7- Classification of plant fossils	2	0	2
8- Pteriodophyta, Psilophyta, Lycopods, Clamophyta, Pterophytes, Pteridosperm	2	0	2
9- Fossils of Gymnospermae	2	0	2
10- Fossils of Angiosperms	2	0	2
11- Uses of plant fossils in correlation and facies interpretation and age determination.	2	0	2
12- The value of plant fossils in paleoecology and environmental studies.	2	0	2
13- Studying some examples of plant fossils from the geology of Egypt.	2	0	2
14- Revision and course evaluation/open session	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

		Intended Learning Outcomes	Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	review the evolution and history of fossilslography and fossils bedogy,	√	√		√		
	a2	recognize the applications of fossils forms in geological and other natural science fields,	√	√		√	√	√
	a3	describe the fossils forms and related fossils properties,	√	√		√	√	√
	a4	demonstrate the basics and theories of bed optics using binocular light,	√	√		√		
Intellectual Skills	b1	differentiate between different types of fossils forms,	√	√		√	√	√
	b2	determine the symmetry elements of fossils line materials,	√			√		
	b3	demonstrate the basic and progressed techniques and methods to fossils bedogy,	√	√		√	√	
	b4	recognize the different beds based on their fossil's properties.	√	√	√	√		
Practical and professional skills	c1	recognize the fossils system and class of a given bed,		√	√	√	√	
	c2	analyze the symmetrical elements of a fossils line material,	√	√		√		
	c3	use the polarizing microscope and identify beds and their fossils properties,		√		√	√	
	c4	apply the investigation results for bed classification and distinctions.		√		√		√
General Skills	d1	collect data from sample examination and other data resources,		√	√	√		
	d2	reproduce the results to meet the projected goals in an easy, readable final form,	√	√		√		
	d3	collaborate and work in team smoothly adhere to ethics and manage time.	√	√		√	√	√

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,

5.4. Final written and oral exams to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course description	x						x						x			
Fossils, fossilization process, conditions promote fossilization		x				x					x					x
Types of fossils				x												
Classification of organisms, bases of classification of fossils			x													
Binomial Nomenclature				x										x		
Plant-fossils through geologic record						x				x						
Classification of plant fossils		x						x						x		
Pteriodophyta, Psilophyta, Lycopods, Clamophyta, Pterophytes, Pteridosperm			x										x			
Fossils of Gymnospermae		x							x						x	
Fossils of Angiosperms	x						x					x		x		
Uses of plant fossils in correlation and facies interpretation and age determination.			x			x							x			
The value of plant fossils in paleoecology and environmental studies.		x								x					x	
Studying some examples of plant fossils from the geology of Egypt.		x														x
Revision and course evaluation/open session			x											x		

6- List of references:
6-1 Course notes
Lecture notes prepared by the course instructor(s)approved by the department council.

6-2 Required books.
None
6-11 Recommended books

William Nesse 2012 Introduction to FossilsBedogy
Oxford University Press; Fourth Edition edition (March 31, 2012) 368 pages,
William Nesse 2012 Introduction to bedogy, Oxford University Press; 2 edition (August 8, 2011) 496 pages

6-12 Periodicals, Web sites, etc.
http://www.xtal.iqfr.csic.es/Cristalografia/parte_03-en.html
http://www.webpages.uidaho.edu/~mgunter/opt_min/article.pdf
http://dave.ucsc.edu/myrtreia/fossils.html

7- Facilities required for teaching and learning:
Power point presentations
Data show
Sound system to ensure the ease listening
Group discussions

Course coordinator:	Prof. Dr. Gamal El Qot Prof. Dr. Hassan El Sheikh Dr. Fatma Shaker
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419) updated on 2022/2023

Course Specification
230 G: Rock Forming Minerals

A- Affiliation

Relevant program: **B. Sc.in Geology**

Department offering the program:	**Department of Geology**
Department offering the course:	**Department of Geology**
Academic year/level:	**Second level**

B - Basic information

Title: Rock forming minerals	**Code:230G**	**Year/level:** Second level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C - Professional information

3 – Course Learning Objectives:

This course is designed to deliver a theoretical and practical understanding of how students can identity the basic principles of mineralogy, identification of minerals, their associations, stability means understanding geological processes. Although rock-forming minerals (mainly silicates) will be emphasized, students will be able to identify other minerals represent common minerals in earth crustal rocks.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a1.provide an overview of fundamental mineralogical principles such as thenature of mineral and mineral groups,

a2. review the genesis, classification, and distribution ofimportant mineral groups,

a3. identifythe basic optical and structural mineralogy skillsrequired for more advanced mineralogical and petrological,

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. differentiate between different types of silicate minerals,

b2. determine the crystallization sequence of silicate formation,

b3.reviewthe basic and progressed techniques and methods to optical mineralogy,

b4.recognize the different minerals based on their optical properties.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. recognize the physical and optical properties of a given mineral,

c2.analyze the opticalpropoerties of a given rock forming mineral,

c3.use the polarizing microscope and identify minerals and their optical properties, c4.apply the investigation results for mineral classification and distinctions.

d - General skills:

On successful completion of the course, the student should be able to:

d1. collect data from sample examination and other data resources,

d2. reproduce the results to meet the projected goals in an easy, readable final form,

d3. collaborate and work in team smoothly adhere to ethics and manage time.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction and course description	2	0	2
2- What is mineral?	2	0	2
3- Classification of minerals	2	0	2
4- How minerals form	2	0	2
5- Mineral composition of mantle and core	2	0	2
6- Mineral composition of earth crust	2	0	2
7- Silicate minerals	2	0	2
8- Carbonate minerals	2	0	2
9- Phosphate, oxides, and sulfate	2	0	2
10- Sulfide minerals	2	0	2
11- Minerals and the society	2	0	2
12- Mineral economics	2	0	2
13- Ore mineral deposits and tectonism	2	0	2
14- Revision and course evaluation/open session	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	provide an overview of fundamental mineralogical principles such as thenature of mineral and mineral groups,	√	√		√		
	a2	review the genesis, classification, and distribution ofimportant mineral groups,	√	√		√	√	√
	a3		√	√		√		

	a4	demonstrate the basic optical and structural mineralogy skillsrequired for more advanced mineralogical and petrological,						
Intellectual Skills	b1	differentiate between different types of silicate minerals,	√	√		√	√	√
	b2	determine the crystallization sequence of silicate formation,	√			√		
	b3	review the basic and progressed techniques and methods to optical mineralogy,	√	X		√	√	
	b4	recognize the different minerals based on their optical properties.	√	√	√	√		
Practical and professional skills	c1	recognize the physical and optical properties of a given mineral,		√	√	√	√	
	c2	analyze the optical propoerties of a given rock forming mineral,	√	√		√		
	c3	use the polarizing microscope and identify minerals and their optical properties,	√	√		√	√	
	c4	apply the investigation results for mineral classification and distinctions.	√	√		√		√
General Skills	d1	collect data from sample examination and other data resources,	√	√	√	√		
	d2	reproduce the results to meet the projected goals in an easy, readable final form,	√	√		√		
	d3	collaborate and work in team smoothly adhere to ethics and manage time.	√	√		√	√	√

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exams to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course description	x						x						x			
What is mineral?		x				x					X					x
Classification of minerals				x												
How minerals form			x													
Mineral composition of mantle and core				x										x		
Mineral composition of earth crust						x				x						
Silicate minerals		x						x						x		
Carbonate minerals			x										x			
Phosphate, oxides, and sulfate		x							x						x	
Sulfide minerals	x						x					x		x		
Minerals and the society			x			x							x			
Mineral economics		x								x					x	
Ore mineral deposits and tectonism		x														x
Revision and course evaluation/open session			x											x		

6- List of references:

6-1 Course notes

Lecture notes prepared by the course instructor(s)approved by the department council.

6-2 Required books.

None

6-13 Recommended books

Introduction to the Rock-Forming Minerals Third Edition
by W. a. Deer, R. a. Howie, J. Zussman
Paperback: 510 pages
Publisher: Mineralogical Society; Third edition (May 16, 2013)
Language: English
ISBN-10: 0903056275
ISBN-13: 978-090305627

6-14 Periodicals, Web sites, etc.

http://www.indiana.edu/~geol105/images/gaia_chapter_5/rock_forming_minerals.htm

7- Facilities required for teaching and learning:

Power point presentations
Data show
Sound system to ensure the ease listening
Group discussions

Course coordinator: Prof. Abdel Aziem M. Mehanna

Head of the Department: Prof. Gamal El Qot
Date: 2022/2023

Course Specification

232 G: Principals of Petrology

A. Affiliation

Relevant program: **B. Sc.in Geology**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Second level**

B. Basic information

Title: Principals of Petrology	**Code:232G**	**Year/level:** Second level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course is designed to deliver theoretical and practical understanding of magmatic crystallization, classification of igneous rocks and their textures, acidic rocks, intermediate rocks, basic rocks and ultrabasic rocks. It also introduces the major classification of metamorphic rocks based on T & P and chemical active fluids, metasomatism and additive processes of metamorphism.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

a1.provide an overview of fundamental of magama crystallization,
a2.review the different processes of magma crystallization and evolution,
a3.recognize the different types of rocks and their petrogrnesis,

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. differentiate between different types of rocks,
b2. determine the texture and mineral composition of igneous and metamorphic rocks,
b3.analyzethe mineral composition of rocks and their tectonic setting,
b4.recognize the different minerals based on their optical properties.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. recognize the rock type and class, and genesis,
c2. analyze the mineral composition of a given rock,
c3. use the polarizing microscope and identify minerals and their optical properties,
c4.apply the investigation results for rock classification and distinctions.

d. General skills:

On successful completion of the course, the student should be able to:

d1. collect data from sample examination and other data resources,

d2. reproduce the results to meet the projected goals in an easy, readable final form,

d3. collaborate and work in team smoothly adhere to ethics and manage time.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction and course description	2		2
2- What is a rock?	2		2
3- Classification of rocks	2		2
4- How rocks form?	2		2
5- Mineral composition of mantle rocks	2		2
6- Mineral composition of crustal rocks	2		2
7- Rock textures	2		2
8- Mineral composition of igneous and metamorphic rocks	2		2
9- Phosphate, oxides, and sulfate	2		2
10- Rock cycle and tectonism	2		2
11- Rock forming minerals	2		2
12- Minerals and rocks under the microscope	2		2
13- Mineral deposits and rock genesis	2		2
14- Revision and course evaluation/open session	2		2
Total hours	**28**		**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	review the evolution and history of the different terms in petrology,	✓	✓		✓		
	a2.	recognize the earth zones and compositions of earth shells,	✓	✓		✓		
	a3.	describe the classification of rocks (rock cycle),	✓	✓		✓		
	a4.	demonstrate the basics and theories of the origin of igneous rocks,	✓	✓		✓		
Intellectual Skills	b1.	differentiate between different forms of Igneous Rocks as well as the intrusions and their relation to geologic structures,	✓	✓		✓	✓	✓
	b2.	determine the structures and textures of igneous rocks,	✓			✓		

	b3.	Demonstrate the classification of igneous rocks,	✓	✓		✓	✓	
	b4.	Recognize some types of igneous rock types of crystal forms.	✓	✓	✓	✓		
Practical and professional skills	c1.	recognize the metamorphic petrology and metamorphism,		✓	✓	✓	✓	
	c2.	determine the agents, kinds, and depth zones of metamorphism,	✓	✓		✓		
	c3.	use the polarizing microscope and identify the metamorphic textures,	✓	✓		✓	✓	
	c4.	apply the investigation results for rock classification and distinctions.	✓	✓		✓		
General Skills	d1.	collect data from sample examination and other data resources,	✓	✓	✓	✓		
	d2.	reproduce the results to meet the projected goals in an easy, readable final form,	✓	✓		✓		
	d3.	collaborate and work in team smoothly adhere to ethics and manage time.	✓	✓		✓	✓	✓

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exams to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course description	x						x						x			
What is a rock?		x				x					x					x
Classification of rocks				x												
How rocks form?			x													

Mineral composition of mantle rocks				x										x		
Mineral composition of crustal rocks						x				x						
Rock textures		x						x						x		
Mineral composition of igneous and metamorphic rocks			x										x			
Phosphate, oxides, and sulfate		x							x						x	
Rock cycle and tectonism	x						x					x		x		
Rock forming minerals			x			x							x			
Minerals and rocks under the microscope		x								x					x	
Mineral deposits and rock genesis		x														x
Revision and course evaluation/open session			x											x		

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructor(s)approved by the department council.

6.2. Required books.

None

6.3. Recommended books

- **The principles of petrology: an introduction to the science of rocks.**
  By Tyrrell, George Walter.
  Publisher: Springer Science & Business Media. 2012
- **Principles of Igneous and Metamorphic Petrology**
  by Anthony Philpotts, Jay Ague.
  Publisher: Cambridge University Press; 2nd edition (February 2, 2009), 686 pages

6.4. Periodicals, Web sites, etc.

http://www.xtal.iqfr.csic.es/Cristalografia/parte_03-en.html
http://www.webpages.uidaho.edu/~mgunter/opt_min/article.pdf
http://dave.ucsc.edu/myrtreia/crystal.html

7. Facilities required for teaching and learning:

Power point presentations
Data show
Sound system to ensure the ease listening
Group discussions

Course coordinator: Prof. Abdel Aziem M. Mehanna
Asst.Prof. Adel Maady

Head of the Department: Prof. Gamal El Qot
Date: 2022/2023

Course Specification

235 G: Crystallography and optical mineralogy

A. Affiliation

Relevant program: **B. Sc.in Geology**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Second level**

B. Basic information

Title: Crystallography and optical mineralogy	**Code:235G**	**Year/level:** Second level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:3	**Total:**5 h/week

C. Professional information

1. Course Learning Objectives:

This course is designed to introduce students to the different systems and classes of crystal forms for mineralogical applications and solid-state physics. Identifying the crystal system and related properties is a clue to recognize the behavior of crystalline materials. Optical mineralogy deals with the polarizing microscope and uses the optical properties of minerals for their identification. Fundamentals of the polarized light and birefringence form a significant part serves a wide variety of applications in physics and chemistry.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should be able to:

a1.detect the interrelationship between crystallography and optical mineralogy,
a2.recognize the applications of crystal forms and symmetry in geological and other natural science fields,
a3.describe the crystal forms and identify each shape if composite,
a4. demonstrate thebasics and theories of mineral optics using polarized light.

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1. Differentiate between different types of crystal forms,
b2. Determine the symmetry elements of crystalline materials,
b3. Envisagethe basic and advanced techniques and methods to optical mineralogy,
b4. Study the different minerals based on their optical properties.

c. Practical and professional skills:

On successful completion of the course, the student should be able to:

c1. recognize the crystal system and class of a given mineral,
c2.checkthe symmetrical elements of a crystalline material,

c3.use the polarizing microscope and identify minerals and their optical properties,
c4.apply the investigation results for mineral classification and distinctions.

d. General skills:

On successful completion of the course, the student should be able to:

d1. collect data from sample examination and other data resources,
d2. reproduce the results to meet the projected goals in an easy, readable final form,
d3. collaborate and work in team smoothly adhere to ethics and manage time.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction and course description	2		2
2. Fundamentals of crystallography	2		2
3. Crystal properties and crystal systems	2		2
4. The 32 crystallographic classes: classification	2		2
5. The isometric and tetragonal systems	2		2
6. Orthorhombic and monoclinic systems	2		2
7. Hexagonal and trigonal systems	2		2
8. Triclinic system and composite crystal forms	2		2
9. Classification of minerals	2		2
10. The polarizing microscope: properties normal light	2		2
11. Optical properties of minerals in plane polarized light	2		2
12. Optical properties of minerals between crossed Nicols	2		2
13. Isotropic and anisotropic minerals	2		2
14. Revision and course evaluation/feedback	2		2
Total hours	**28**		**28**

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	Detect the interrelationship between crystallography and optical mineralogy	✓	✓		✓		
	a2.	Recognize the applications of crystal forms and symmetry in geological and other natural science fields	✓	✓				✓
	a3.	Describe the crystal forms and identify each shape if composite	✓	✓		✓	✓	✓
	a4.	Demonstrate thebasics and theories of mineral optics using polarized light.	✓	✓		✓		
Intellectual Skills	b1.	Differentiate between different types of crystal forms	✓	✓		✓	✓	✓
	b2.	Determine the symmetry elements of crystalline materials	✓			✓		
	b3.	Envisage the basic and advanced techniques and methods to optical mineralogy	✓	✓		✓	✓	
	b4.	Study the different minerals based on their optical properties	✓	✓	✓	✓		
Practical and professional skills	c1.	Recognize the crystal system and class of a given mineral		✓	✓	✓	✓	
	c2.	Check the symmetrical elements of a crystalline material	✓	✓		✓		
	c3.	Use the polarizing microscope and identify minerals and their optical properties	✓	✓		✓	✓	
	c4.	Apply the investigation results for mineral classification and distinctions.	✓	✓		✓		✓
General Skills	d1.	Collect data from sample examination and other data resources	✓	✓	✓	✓		
	d2.	Reproduce the results to meet the projected goals in an easy, readable final form	✓	✓		✓		
	d3.	Collaborate and work in team smoothly adhere to ethics and manage time.	✓	✓		✓	✓	✓

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exams to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

Contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course description	x						x						x			
Fundamentals of crystallography		x				x					x					x
Crystal properties and crystal systems				x												
The 32 crystallographic classes: classification			x													
The isometric and tetragonal systems				x										x		
Orthorhombic and monoclinic systems						x				x						
Hexagonal and trigonal systems		x						x						x		
Triclinic system and composite crystal forms			x										x			
Classification of minerals		x							x						x	
The polarizing microscope: properties normal light	x						x					x		x		
Optical properties of minerals in plane polarized light			x			x							x			
Optical properties of minerals between crossed Nicols		x								x					x	
Isotropic and anisotropic minerals		x														x
Revision and course evaluation/feedback			x											x		

6. List of references:

6.1. Course notes
Lecture notes prepared by the course instructor(s)approved by the department.
6.2. Required books.
None
6.3. Recommended books
Introduction to Crystallography and Mineral Crystal Systems
http://www.rockhounds.com/rockshop/xtal/index.shtml
William Nesse 2012 Introduction to Optical Mineralogy
Oxford University Press; Fourth Edition (March 31, 2012) 368 pages,

6.4. Periodicals, Web sites, etc.
http://dave.ucsc.edu/myrtreia/crystal.html

7. Facilities required for teaching and learning:
Power point presentations
Data show
Sound system to ensure the ease listening
Group discussions

Course coordinator:	Prof. Abdel Aziem M. Mehanna Asst.Prof. Moustafa M. Mogahed
Head of the Department:	Prof. Gamal El Qot
Date:	2022/2023

Course Specification
240 G: Geographic Information System (GIS)

A- Affiliation

Relevant program: **B. Sc.in Geology**
Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Second level**

B - Basic information

Title:Geographic Information System (GIS)	**Code:240G**	**Year/level:** Second level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C - Professional information

1– Course Learning Objectives:

This course is designed to deliver a theoretical and practical understanding of how students can identify the computer-based database management system for capture, storage, retrieval, analysis, and display of spatial data. Students who complete this program will be better prepared to map data for decision-making in business, environmental protection, risk assessment, utility planning and management, emergency response, land use planning, transportation planning, delivery route planning, real estate, and crime prevention.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a1.recognize the fundamentals of GIS in geology and other geosciences,
a2. review the basics of projection methods and layer systematics,
a3. demonstrate the basic skills required for GIS based geological projects,
a4. relaize the increasing need for GIS based maps and datasets.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. differentiate between different types of map projections,
b2. determine the database elements,
b3.demenostsate the basic and progressed techniques and methods in GIS,
b4.recognize the different environments of GIS work.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1.use the software for creating data sets in a GIS environment,

c2. analyze the components of a GIS mapping,
c3. explore a GIS project and identify elements and their properties,
c4. envisage the symbols and layers of a composite data set.

d - General skills:
On successful completion of the course, the student should be able to:
d1. collect data from sample examination and other data resources,
d2. reproduce the results to meet the projected goals in an easy, readable final form,
d3. collaborate and work in team smoothly adhere to ethics and manage time.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction and course description	2	0	2
2- Mapping Data	2	0	2
3- Data Processing	2	0	2
4- Advantages of Digital Storage	2	0	2
5- Functions of Geological Information System	2	0	2
6- Components of Geological Information System	2	0	2
7- Planning for Geological Information System	2	0	2
8- ArcGIS environment	2	0	2
9- Geocoding	2	0	2
10- Working with Geodatabases	2	0	2
11- Basic Editing in ArcMap	2	0	2
12- Coordinate Systems and Map Projections	2	0	2
13- Drawing and Symbolizing Features	2	0	2
14- Revision and course evaluation/open session	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Knowledge & Understanding	a1	recognize the fundamentals of GIS in geology and other geosciences,	√	√		√		
	a2	review the basics of projection methods and layer systematics,	√	√	√	√	√	√
	a3	demonstrate the basic skillsrequired for GIS based geological projects,	√	√	√	√	√	√

	a4	relaize the increasing need for GIS based maps and datasets.	√	√	√	√		
Intellectual Skills	b1	differentiate between different types of map projection,	√	√		√	√	√
	b2	determine the database elements,	√			√		
	b3	demenostsate the basic and progressed techniques and methods in GIS,	√			√	√	
	b4	recognize the different environments of GIS work.	√	√	√	√		
Practical and professional skills	c1	use the software for creating data sets in a GIS environ,		√	√	√	√	
	c2	analyze the component of a GIS map,	√	√		√		
	c3	explore a GIS project and identify elements and their properties,	√	√		√	√	
	c4	envisage the symbols and layers of a composite data set.	√	√		√		√
General Skills	d1	collect data from sample examination and other data resources,	√	√	√	√		
	d2	reproduce the results to meet the projected goals in an easy, readable final form,	√	√		√		
	d3	collaborate and work in team smoothly adhere to ethics and manage time.	√	√		√	√	√

5- Students’ Assessment Methods and Grading:

5.1. Discussion, class activates and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exams to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1-a2, a3, b1, b2, b4, and c1	Fifth week	10 %
Mid-Term Exam	a1, a5, b3, b4.	Seventh week	6 %
Oral exam	a2, a3, a4, a5, b5, b1, c2, c3	Thirteenth week	12 %
Written exam	a1, a2, a3, a5, b1, b2, b4, b5, c1, c2, c3, d1.	Fourteenth week	72 %
Total			100 %

-Course matrix

Contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course description	x						x						x			
Mapping Data		x				x					x					x
Data Processing				x												
Advantages of Digital Storage			x													
Functions of Geological Information System				x										x		
Components of Geological Information System						x				x						
Planning for Geological Information System		x						x						x		
ArcGIS environment			x										x			
Geocoding		x							x						x	
Working with Geodatabases	x						x					x		x		
Basic Editing in ArcMap			x			x							x			
Coordinate Systems and Map Projections		x								x					x	
Drawing and Symbolizing Features		x														x
Revision and course evaluation/open session			x											x		

6- List of references:

6-1 Course notes

Lecture notes prepared by the course instructor(s)approved by the department council.

6-2 Required books.

None

6-15 Recommended books

-Geographic Information Systems and Science (by Paul A. Longley)
-A to Z GIS: An Illustrated Dictionary of Geographic Information Systems (by Tasha Wade)
-Geographic information system from start, 2007, Dr. Ahmed Saleh El Shemry.
-أساسيات نظم المعلومات الجغرافية للدكتور/ وسام الدين محمد، 2008

6-16 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:

Power point presentations
Data show
Software
Sound system to ensure the ease listening
Group discussions

Course coordinator:	Prof. Dr. Wael Hagag
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification

250 G: Principles of Geophysics

A. Affiliation

Relevant program: **B.Sc. in Geology**
Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Second level**

B. Basic information

Title: Principals of Geophysics	**Code:250G**	**Year/level:** Second level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course is designed to introduce students to principles and processes the geophysical techniques and its relationship with the other geological branches. It aims to train students on reorganization of the physical characteristics of the rocks and to introduce the geophysical applied methods and their role in solving the geological, engineering and environmental problems.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

a1.recognize the principals of Geophysics
a2.relate the different geophysical solution and interpretation to geological problems.
a3.realize differences in geophyscail methods and used techniques,
a4. recognize the methods and techniques used for geophysical prospection and exploration.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. analyze the setting geophysical data and their evolution,
b2. imagine and confirm new hypotheses, new problem descriptions, and new methods for analyzing data,
b3. demonstrate the willingness to question conventional formulations of problems,
b4. study the distribution of ores oil in the various rock assemblages,

a. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. Apply the different methods of applied geophysics in looking for water, gas and oil,
c2.design and carry out a geophysical survey or laboratory experiment and ensure that the recorded data are of the highest-possible quality,

C3. analyze the various geological and geophysical data of a potential ore body.

d. General skills:

On successful completion of the course, the student should be able to:

d1. deal rationally with uncertainty and have demonstrated that they recognize that geophysical data are always incomplete and uncertain,

d2. quantify the uncertainty and recognize when it is not acceptable to make decisions based on these data,

d3. Demonstrate qualities that are the foundation of leadership.

3 – Contents

Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
1. Introduction to Geophysics	2		2
2. Physical properties of rocks	2		2
3. Gravitational acceleration methods	2		2
4. Gravimeter data collection, reduction and interpretation	2		2
5. Geomagnetic methods	2		2
6. Interpretation of geomagnetic data	2		2
7. Seismic acquisition methods	2		2
8. Seismic processing and interpretation	2		2
9. Earthquake seismicity	2		2
10. Geoelectrical methods	2		2
11. Georadar method	2		2
12. Heat flow characteristics of the Earth; flow modeling	2		2
13. Drilling and well logging	2		2
14. General revision	2		2
Total hours	**28**		**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	recognize the principals of Geophysics,	✓		✓			✓
	a2.	relate the different geophysical solution and interpretation to geological problems,	✓	✓				
	a3.	realize differences in geophyscail methods and used techniques,	✓					✓
	a4.	recognize the methods and techniques used for geophysical prospection and exploration.		✓		✓	✓	✓
Intellectual Skills	b1.	analyze the setting geophysical data and their evolution,				✓	✓	
	b2.	imagine and confirm new hypotheses, new problem descriptions, and new methods for analyzing data,		✓	✓			✓
	b3.	demonstrate the willingness to question conventional formulations of problems,				✓	✓	
	b4.	study the distribution of ores oil in the various rock assemblages,	✓					✓
Practical and professional skills	c1.	apply the different methods of applied geophysics in looking for water, gas and oil,	✓				✓	✓
	c2.	design and carry out a geophysical survey or laboratory experiment and ensure that the recorded data are of the highest-possible quality,	✓		✓		✓	✓
	c3.	analyze the various geological and geophysical data of a potential ore body.	✓		✓		✓	✓
General Skills	d1.	deal rationally with uncertainty and have demonstrated that they recognize that geophysical data are always incomplete and uncertain,		✓	✓			✓
	d2.	recognize when it is not acceptable to make decisions based on these data,	✓					
	d3.	demonstrate qualities that are the foundation of leadership.	✓	✓				✓

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,

5.2. Assignments to assess the student independent work,

5.3. Written mid-term exam to ensure the student progress and discover the shortage,

5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

Contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to Geophysics	x						x						x			
Physical properties of rocks		x				x					x					x
Gravitational acceleration methods				x												
Gravimeter data collection, reduction and interpretation			x													
Geomagnetic methods				x										x		
Interpretation of geomagnetic data						x				x						
Seismic acquisition methods		x						x						x		
Seismic processing and interpretation			x										x			
Earthquake seismicity		x							x						x	
Geoelectrical methods	x						x					x		x		
Georadar method			x			x							x			
Heat flow characteristics of the Earth; flow modeling		x								x					x	
Applications in Exploration for Petroleum		x														x
General revision			x											x		

6. List of references:

6.1. Course notes
Lecture notes prepared by the course instructor(s)
Power point presentations

6.2. Required books.
None
6.3. Recommended books

Fundamentals of Geophysics (Second edition)
Sharma, P. V., 1997, Environmental & engineering geophysics, Cambridge University Press.
Seismic Modeling of Geologic Structures: Applications to Exploration Problems (Geophysical Development, Vol 2) by Stuart William Fagin (Dec 1991)

6.4. Periodicals, Web sites, etc.
Austoralian geophysics
AAPG (American association of petroleum geology)

7. Facilities required for teaching and learning:
Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinator:	Dr. Wafaa El Shahat Dr. Mohamed Salem Al Aaser
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification

217Ch: Aliphatic Organic Chemistry

A. Affiliation

Relevant program: B.Sc. in Geology Program
Department offering the program: Department of Geology
Department offering the course: Department of Chemistry
Academic year/level: Second level

B. Basic information

Title: Aliphatic Organic Chemistry	**Code:**217Ch	**Year/level:** Second level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:3	**Total:**5 h/week

C. Professional information

1. Course Learning Objectives:

The objective of this course is to enable the students to understand halogenated derivatives of hydrocarbons, alcohols, ethers, amines, aliphatic aldehydes and ketones, carboxylic acid derivatives, active methylene compounds and alicyclic compounds.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. State halogenated derivatives of hydrocarbons
a2. List the different types of alcohols and ethers.
a3. Describe the various classes of aliphatic amines.
a4. Illustrate the active methylene compounds.
a5. Recognize the aliphatic aldehydes and ketones.
a6. Recite alicyclic compounds, carboxylic acids and their derivatives.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Explain compounds of alcohols and ethers
b2. Differentiate between alicyclic compounds, aldehydes and ketones
b3. Compare carboxylic acids, esters, amides and anhydrides.
b4. Distinguish the different types of active methylene compounds.

b. Practical and professional skills:

On successful completion of the course, the student should be able to:

c1. Identify different solid organic compounds.
c2. Modify the synthesis methods of organic compounds.

d. General skills:

On successful completion of the course, the student should be able to:

d1. Solve problems on the scientific basis taught in this course.

d2. Work in a team effectively, manage time, collaborate and communicate with others positively.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction	2		3
2. Halogenated derivatives of hydrocarbons	2		3
3. Alcohols	2		3
4. Ethers	2		3
5. Aliphatic amines	2		3
6. Aliphatic aldehydes	2		3
7. Aliphatic ketones	2		4
8. Carboxylic acids	2		4
9. Derivatives of carboxylic acids	2		4
10. Active methylene compounds	4		4
11. Alicyclic compounds	4		4
12. Revision	2		4
Total hours	**28**		**42**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	State halogenated derivatives of hydrocarbons	✓					✓
	a2.	List the different types of alcohols and ethers.	✓				✓	
	a3.	Describe the various classes of aliphatic amines.	✓				✓	✓
	a4.	Illustrate the active methylene compounds.	✓	✓			✓	✓

	a5.	Recognize the aliphatic aldehydes and ketones.	✓			✓	✓	✓
	a6.	Recite alicyclic compounds, carboxylic acids and their derivatives.	✓				✓	✓
Intellectual Skills	b1.	Explain compounds of alcohols and ethers	✓		✓			✓
	b2.	Differentiate between alicyclic compounds, aldehydes and ketones	✓	✓			✓	✓
	b3.	Compare carboxylic acids, esters, amides and anhydrides	✓			✓		✓
	b4.	Distinguish the different types of active methylene compounds.	✓					✓
Practical and	c1.	Identify different solid organic compounds	✓	✓	✓		✓	✓
	c2.	Modify the synthesis methods of organic compounds.			✓			✓
General Skills	d1.	Solve problems on the scientific basis taught in this course.	✓			✓		✓
	d2.	Work in a team effectively, manage time, collaborate and communicate with	✓	✓			✓	✓

5. Students' Assessment Methods and Grading:

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructors and proved by chemistry department.

6.2. Required books.

"Organic Chemistry for competitive examinations", ArunBahl, Penjab University, INDIA, 2009

6.3. Recommended books

None

6.4. Periodicals, Web sites, etc.

Journal of Chemical Education (ACS)

http://www.public.asu.edu/~jpbirk/CHM-115_BLB/Chpt24/
http://ocw.mit.edu/courses/chemistry/5-112-principles-of-chemical-science-fall-2005/
http://www.docbrown.info/page07/appendixtrans11.htm

7. Facilities required for teaching and learning:

Using a microphone in lectures
Using a black board
Group Discussions
Data show

Course coordinator:	Dr. Enas Abdelalim Dr. Amal Mohamed
Head of the Department:	Prof. Dr. Wagdy Eldougdoug
Date:	2022-2023

Course Specification

225Ph: Principals of Modern Physics

A. Affiliation

Relevant program:	B.Sc. in Geology Program
Department offering the program:	Department of Geology
Department offering the course:	Department of Physics
Academic year/level:	Second level

B. Basic information

Title: Principles of Modern Physics	**Code:**225 Ph	**Year/level:** second level
Teaching Hours:	**Lectures:**2	**Tutorial: -**
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

By Finishing of this course the graduate will able to

Recognize the concept of Newtonian relativity and Galilian transformation of coordinates Study postulates of special relativity and its applications in time dilation and length contraction. Illustrate black body radiation in two cases: classical and quantum concept. Illustrate photoelectric effect using classical concept and Einstein concept which agree with the experiment. Introduce the x-ray and Compton effect to discuss the concept of particle wave complementarity. Illustrate quantum Bohr model of atom which helps understanding of some spectral series for hydrogen atom and prediction to other spectral lines.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Recognize the difference between Newtonian relativity concept and Einstein relativity.

a2. Investigate the black body radiation in two cases: classical and quantum concept.

a3. Illustrate photoelectric effect using classical concept and Einstein concept which agree with the experiment.

a4. Describe the x-ray and Compton effect and Uncertainty principle.

a5. Investigate the quantum Bohr model of atom to calculate spectral series for hydrogen atom.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Exam the validity of different atomic modes.

b2. Collect, summarize, and analyze the practical data.

b3. Reason in any atomic phenomena by a logic way.

b4. Interest in X-ray applications.

c. Practical and professional skills:

On successful completion of the course, the student should be able to.

c1. Collect and analyze the atomic spectra.

c2. Design the computer programs to describe the atomic spectroscopy.

c3. Sketch the phase diagram for different types of materials.

d. General skills:

On successful completion of the course, the student should be able to.

d1. Solve problems in time dilation and length contraction using Lorentz trans formations.

d2. Communicate to work efficiently in a team or separately.

d3. Collect data and wrighting reports in the different model of atom and x-rays.

3. Contents

No	**Topic**	**Lecture hours**	**Tutorial hours**	**Practical hours**
1	Principles of Modern Physics	2		4
2	Black body radiation	2		2
3	Plank's law and photoelectric effect	4		3
4	Rutherford model hydrogen atom	2		2
5	Bohr and Somerfield theories	4		4
6	Compton effect	2		2
7	**Mid-Term Exam**	2		4
8	De proglie waves and Uncertainty Principles	4		2
9	Principle of special relativistic theory	6		5
	Total hours	**28**		**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes	**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**

Knowledge & Understanding	a1.	Recognize the difference between Newtonian relativity concept and Einstein relativity.	✓		✓		✓	
	a2.	Investigate the black body radiation in two cases: classical and quantum concept	✓			✓		✓
	a3.	Illustrate photoelectric effect using classical concept and Einstein concept which agree with the experiment	✓		✓	✓		
	a4.	Describe the x-ray and Compton effect and Uncertainty principle	✓		✓		✓	
	a5.	Investigate the quantum Bohr model of atom to calculate spectral series for hydrogen atom	✓			✓		✓
Intellectual Skills	b1.	Exam the validity of different atomic modes.	✓			✓		
	b2.	Collect, summarize, and analyze the practical data.	✓		✓			✓
	b3.	Reason in any atomic phenomena by a logic way.	✓					
	b4.	Interest in X-ray applications	✓					
Practical and professional skills	c1.	Collect and analyze the atomic spectra	✓					
	c2.	Design the computer programs to describe the atomic spectroscopy	✓		✓		✓	
	c3.	Sketch the phase diagram for different types of materials	✓		✓	✓		
General Skills	d1.	- Solve problems in time dilation and length contraction using Lorentz trans formations	✓				✓	✓
	d2.	Communicate to work efficiently in a team or separately	✓		✓	✓		
	d3.	Collect data and wrighting reports in the different model of atom	✓		✓			✓

5. Students' Assessment Methods and Grading:

Tools	**To Measure**	**Time schedule**	**Grading**
Semester Work	a1, a2, a4, b1, b2 and d1	Fifth week	5 %
Mid-Term Exam	a1, a2, a3, b2, d1, and d2	Seventh week	5 %
Oral exam	a1, a3, a4, b1, b3, c1, and d2	Thirteenth week	10 %
Written exam	a1, a2, a3, a4, b1, b2, b3, c1, d1and d2	Fourteenth week	80 %
Total			100 %

6. List of references:

6.1. Course notes

Manual notebook

6.2. Required books.

The concepts and theories of modern physics, 2006, by John Bernhard Stallo

6.3. Recommended books.

Concepts of Modern Physics, 2008, by **Arthur Beiser**

Ancient and Modern Physics, 2010, by Thomas E. Willson

6.4. Periodicals, Web sites, etc.

http://www. Physics2000

http://www. Physics today

7. Facilities required for teaching and learning:

Using a microphone in lectures

Using a black board

Group Discussions

Data show

Course coordinator:

Assistant Professor Dr. Hassan Omar

Associate Professor Dr. Ibrahim Almashad

Head of the Department: Prof. Dr. Saeed El-Sayed Abdel Ghany

Date: **2022-2023**

Course Specification
306-G: Field training

A- Affiliation

Relevant program: Geology B.Sc. Program
Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Third level

B - Basic information

Title: Field training	**Code:306-G**	**Year/level:** third level
Teaching Hours:	**Lectures:** 0	**Tutorial:** 0
	Practical: 3	**Total:**3 h/week

C - Professional information

1 – Course Learning Objectives:

The main objectives of the field course are to provide the student with the following. skills:

- Map location with pocket transit and GPS, including triangulation with topographic maps.
- Basic map location techniques with the pocket transit and topographic map (Hand-levelling, triangulation, etc.).
- Topographic and geologic survey techniques with the pocket transit/GPS.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should be able to:

a1- know data and information from different sources about a certain topic.
a2-identity essay or research about a given topic.
a3-Geologic field mapping and structural analysis in a polydeformed metamorphic and igneous terranes and folded to undeformed sedimentary rocks.
a4- Measurement of stratigraphic section and construction of stratigraphic columns with detailed description.
a5- Construction of geologic cross-sections.

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- interpret logically.
b2- solve problems.
b3- interpret accuracy

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1- differentiate available tools to solve a problem or to collect data.
c2- investigate certain subject.

c3- differentiate the basic units of the research including the introduction, material and methods, results, discussions, and references

d - General skills:

On successful completion of the course, the student should be able to:

d1. Computer, internet & communications.
d2. Management, working in group & life-long learning.
d3. Ethical behavior, community linked thinking.
d4- How to plan efficient use time
d5- Use of WWW and electronic library for search

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Geology department organize geologic field trip (10 days) to one of the mountainous terrains in Egypt to train the student on the geologic field work and sample collecting and the basis of geological mapping and the student must introduce comprehensive geologic report about the different activity during the field trip and this report will be evaluated as practical paper.	0	0	3
1. Field Equipment, and rules-, behaviour- and safety in the Field	0	0	3
2. Field-structural skills	0	0	3
3. Observations At Different Scales	0	0	3
4. Description of igneous/ metamorphic rocks	0	0	3
5. Differentiate between different rock types in the field			
6. Geologic structures in the field	0	0	3
7. Measuring structural elements in the field	0	0	3
8. Geologic - and structural- traverses	0	0	3
9. Interpretations based on limited data and time	0	0	3
10. Reporting measurements and observations	0	0	3
11. Geologic mapping techniques	0	0	3
12. Mineral resources in the field	0	0	3
13. Filed study in hydrology	0	0	3
14. Writing technical reports and structural history	0	0	3
Total hours	**0**	0	**42**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	know data and information from different sources about a certain topic.	x	0	x	0	0	X
	a2	identity essay or research about a given topic.	x	x	0	0	0	0
	a3	Geologic field mapping and structural analysis in a polydeformed metamorphic and igneous terranes and folded to undeformed sedimentary rocks.	x	0	0	0	0	X
	a4	Measurement of stratigraphic section and construction of stratigraphic columns with detailed description.	x	x	0	0	X	X
	a5	Construction of geologic cross-sections.	x					
Intellectual Skills	b1	interpret logically.	**x**	0	0	**0**	**X**	**0**
	b2	solve problems.	**x**	0	0	**0**	**x**	**X**
	b3	interpret accuracy	x	0	0	**0**	**X**	**0**
Practical and professional skills	c1	differentiate available tools to solve a problem or to collect data.	x	0	0	0	X	X
	c2	investigate certain subject.	x	0	0	0	X	X
	c3	differentiate the basic units of the research including the introduction, material and methods, results, discussions and references	x	0	0	0	x	X
General Skills	d1	Computer, internet & communications.	x	x	0	0	0	X
	d2	Management, working in group & life-long learning	x	x	o	o	o	X
	d3	Ethical behavior, community linked thinking.	x	x	o	o	x	X
	d4	How to plan efficient use time	x	x	0	0	x	X

	d5	Use of WWW and electronic library for search	x	0	x	0	x	X

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude.
5.2. Assignments to assess the student independent work,
5.3. A field trips.
5.4. Written mid-term exam to ensure the student progress and discover the shortage.
5.5. Final written and oral exam to evaluate students and promote for other consequent courses.

6- List of references:
6-1 Course notes
Manual of Field Geology

6-2 Required books.

Davis, George H., 1984, Structural Geology of Rocks and Regions: John Wiley & Sons, Inc., New York, New York, 492p.

6-17 Recommended books

Marshak, Stephen and Mitra, Gautam, 1988, Basic methods of structural geology: Prentice Hall, Englewood Cliffs, New Jersey, 446p.

6-18 Periodicals, Web sites, etc.
www.sciencedirect.com&www.geology.com

7- Facilities required for teaching and learning:
Data show
Using a blackboard
Group discussions

Course coordinator: Prof. Abdel Aziem M. Mehanna
Asst.Prof. Moustafa M. Mogahed
Head of the Department: Gamal El Qot
Date: 2022/2023

Course Specification
310 G: Chrono- and Chemo- Stratigraphy

A- Affiliation

Relevant program:	**B.Sc. in Geology**
Department offering the program:	**Department of Geology**
Department offering the course:	**Department of Geology**
Academic year/level:	**Third level**

B - Basic information

Title: Chrono- and Chemical Stratigraphy	**Code:310G**	**Year/level:** third level
Teaching Hours:	**Lectures:** 2 **Practical:** 2	**Tutorial:** 0 **Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is aimed at introducing students to o introduce the morphology and evolution of fossil invertebrates. Includes discussion of ancient environments and changes in life forms with time.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should be able to:

a1. approach Geologic Time Scale and "how it grew" including the most significant biological events of the Phanerozoic

a3. review processes of fossilization including "what is a fossil?" with examples,

a4. realize taxonomic and habitat classification of major invertebrate groups; phylogeny of dominant invertebrate taxa – grades and clades how hydrogeology is interrelated with other natural and environmental science disciplines.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- analyze the anatomy of stratigraphically significant invertebrate taxa,

b2- determine chronostratigraphic distribution of dominant invertebrate groups,

b3. Investigate Invertebrate fossils as indicators of ancient environments,

b4. explore the major extinction events in the biologic history of Earth as evidenced in the fossil record.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1: acquire substantial quantities of information, process it effectively, and draw appropriate conclusions,

c2: report accurate observations and measurements,

c3. analyze the various geological and stratigraphical issues of fossils,

c4. carry out scientific research and evaluate and make use of the material so acquired,

d - General skills:

On successful completion of the course, the student should be able to:

d1. work productively with others,

d2: communicate effectively in writing,

d3. organize and manage working time, schedule tasks, and meet deadlines,

d4. Use computer, internet & communications.

d5. adhere to ethical and community linked thinking

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction	2	0	2
2. Evidence of interruptions of sedimentation	2	0	2
3. Stratigraphical classification	2	0	2
4. Types of lithostratigraphic units	2	0	2
5. Some important lithofacies	2	0	2
6. Biostratigraphical units	2	0	2
7. Biostratigraphy and evolution	2	0	2
8. Types of chronostratigraphical units	2	0	2
9. Magnetostratigraphy and Chemostratigraphy	2	0	2
10. Stratigraphical interpretation	2	0	2
11. Procedures to determine lithostratigraphical units	2	0	2
12. Completeness of the stratigraphical record	2	0	2
13. Limits to biostratigraphical evolution	2	0	2
14. Revision	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	Provide an overview of fundamental terms such as Stratigraphy in general, Lithostratigraphy,Biostratigraphy,Chronostratigraphy, Chemostratigraphy, Magnetostratigraphy, etc….	√		√			√

	a2	Review the different units of Litho, Bio and chronostratigraphy.	√	√				
	a3	Know that Lithofacies refer to: -A mappable subdivision of a designated stratigraphic unit, distinguished from adjacent subdivisions on the basis of lithology; a facies characterized by particular lithologic features. -The rock record of any particular sedimentary environment, including both physical and organic characteristics.	√					√
	a4	Recognize the different Types of Chemical Variations in chemostratigraphy.	√	√			√	√
Intellectual Skills	b1	Differentiate between Chemostratigraphy and Magnetostratigraphy.				√	√	√
	b2	review the basics of stratigraphy and paleotology in the geological fields.				√	√	√
	b3	demonstrate thebasics and theories of mineral litho and biostratigraphy.		√		√		√
	b4	differentiate between different types of lithofacies,		√		√		√
Practical and professional skills	c1	recognize the variations and classification of litholgies, and fossils controlling a facies,				√	√	√
	c2	make and record accurate observations and measurements,				√	√	√
	c3	analyze the paleoenvironment using the lithostratigraphic and biostratigraphic units,		√		√		√
	c4	Use the fossils to identify formations and their depositional conditions,		√		√		√
	c5	Carry out scientific research and evaluate chrono and chemical stratigraphic issues.				√	√	√
General Skills	d1	work productively with others,	√	√				√
	d2	communicate effectively in writing,	√	√				√
	d3	organize and manage working time, schedule tasks, and meet deadlines,	√	√				√
	d4	Use computer, internet & communications.	√	√				√
	d5	Adhere to ethical and community linked thinking	√	√				√

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

Contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction	x						x						x			
Evidence of interruptions of sedimentation		x				X					x					x
Stratigraphical classification				X												
Types of lithostratigraphical units			x													
Some important lithofacies units				X										x		
Biostratigraphical units						X				x						
Biostratigraphy and evolution		x						x						x		
Types of chronostratigraphical units			x										x			
Magnetostratigraphy and Chemostratigraphy		x							x						x	
Stratigraphical interpretation	x						x					x		x		
Procedures to determine lithostratigraphical units			x			X							x			
Completeness of the stratigraphical record		x								x					x	
Limits to biostratigraphical evolution		x														x
Revision			x											x		

6- List of references:
Brookfield, M. E. (2008). *Principles of stratigraphy*. John Wiley & Sons.

6-1 Course notes

Lecture notes prepared by the course instructor(s)
Power point presentations
Manual notes handle of Hydrogeology for students.

6-2 Required books.

None

6-19 Recommended books

G. Nichols (2009) Sedimentology and Stratigraphy, 2nd edition. ISBN 978-1-4051- 3592-4
H. Levin (2010) The Earth through Time.ISBN: 978-0470-387740
Brookfield, M (2004) Principles of Stratigraphy. ISBN 1-4051-1164-X

6-20 Periodicals, Web sites, etc.

www.google.com & www.scincedirect.com

7- Facilities required for teaching and learning:

Data show & video shows
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinator:	Prof. Dr. Gamal El Qot Prof. Dr. Hassan El Sheikh
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419)

updated on 2022/2023

Course Specification

315-G: Geomorphology and Paleoecology

Relevant program: **B.Sc. inGeology**
Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Third Level**

B - Basic information

Title: Geomorphology and Paleoecology	**Code:**315G	**Year/level:** Third level
Teaching Hours:	**Lectures:** 2 **Practical:**2	**Tutorial:** 0 **Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is dedicated to furnishing the student with the necessary basic information about the different geomorphological features and paleoecology. It aims to teach student how to recognize and differentiate between the different types of fossil groups in general and index fossils in particular.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

a1. identifythe paleoenvironmental controls associated with the various types of fossils, principally macrofossils
a2. To give suitable information on paleoecology and the recognition of paleoenvironment.
a3. To give suitable information on taphonomy and the recognition of paleoenvironment.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1- discriminate between terrestrial, aquatic, and marine fossil types,
b2- identify fossil groups and their ecology in the geologic past.
b3- identify microfossil groups and major palynomorph categories under the microscope.
b4- To be able to reconstruct the paleoenvironment

c - Practical and professional skills:

On successful completion of the course, the student should be able to:

c1- Process sedimentary rock samples for their fossil palynomorph content,

c2- Employ microfossils to provide information about the stratigraphy of their enclosing sedimentary rocks,
c3- Utilize microfossils as a proxy to interpret the depositional paleoenvironment of rock layers,
c4- Reconstruct the geologic history of stratified rocks based on their microfossil content.

d - General skills:
On successful completion of the course, the student should be able to:
d1- Work with peers on small projects,
d2- Accomplish given scientific tasks either individually, or with a group,
d3- Make an internet and library search to prepare a report on a given class assignment,
d4- Communicate scientific data orally to the class audience with the help of technology aids such as a PowerPoint presentation.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. General Introduction	2	0	2
2. Slope evolution	2	0	2
3. Landscape forms	2	0	2
4. Cuestal landscapes	2	0	2
5. Landforms in tropics and cold climate	2	0	2
6. Landscape form in the Mediterranean region	2	0	2
7. Landforms in Egypt	2	0	2
8. Paleoecology as a science	2	0	2
9. Types of ancient ecologies	2	0	2
10. The fundamental principles of paleoecology	2	0	2
11. Paleosynecology	2	0	2
12. Paleoautecology.	2	0	2
13. Taphonomy; Taphonomical parameters and reconstruction of the Paleoenvironment.	2	0	2
14. Shell-beds and their interpretation.	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes	**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**

Knowledge & Understanding	a1	Be able to provide a brief account on the different types of micro fossils including palynomorphs	√					
	a2	Be able to recognize the difference between the different microfossil groups- particularly palynomorphs		√				
	a3	Recognise the paleoenvironmental controls associated with the various types of microfossils, principally palynomorphs		√				
	a4	Realize the stratigraphic value and range of application of the major microfossil types specially palynomorphs	√	√		√	√	√
Intellectual Skills	b1	Discriminate between terrestrial, aquatic, and marine microfossil types	√	√		√		√
	b2	Identify microfossil groups and major palynomorph categories under the microscope		√		√		
	b3	Describe the basic morphologic features of the different microfossil groups with emphsis on palynomorphs	√	√	√	√		
	b4	Recognize example genera and/or species of the different microfossil categories particularly palynomorphs		√		√		
Practical and professional skills	c1	Process sedimentary rock samples for their fossil palynomorph content	√	√		√		
	c2	Employ microfossils to provide information about the stratigraphy of their enclosing sedimentary rocks	√	√			√	√
	c3	Utilize microfossils as a proxy to interpret the depositional paleoenvironment of rock layers	√	√			√	√
	c4	Reconstruct the geologic history of stratified rocks based on their microfossil content			√		√	√
General Skills	d1	Work with peers on small projects		√	√	√	√	√
	d2	Accomplish given scientific tasks either individually, or with a group		√	√	√	√	√
	d3	Make an internet and library search to prepare a report on a given class assignment		√	√	√	√	
	d4	Communicate scientific data orally to the class audience with the help of technology aids such as a PowerPoint presentation		√	√			

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate the students and promote to other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester work	ILOs a, b, d	Semester course	8 %

Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

Contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
General Introduction	x						x						x			
Slope evolution		x				x					x					x
Landscape forms				x												
Cuestal landscapes			x													
Landforms in tropics and cold climate				x										x		
Landscape form in the Mediterranean region						x				x						
Landforms in Egypt		x						x						x		
Paleoecology as a science			X										x			
Types of ancient ecologies		x							x						x	
The fundamental principles of paleoecology	x						x					x		x		
Paleosynecology			x			x							x			
Paleoautecology.		x								x					x	
Taphonomy; Taphonomical parameters and reconstruction of the Paleoenvironment.		x														x
Shell-beds and their interpretation.			x											x		

6- List of references:

6-1 Course notes
Lecture notes prepared by the course instructor.
Power point presentations

6-2 Required books.
None

6-21 Recommended books
.Text book: Palecology
Author: Dood, J. R. & Stanton, R. J.
Second edition 1990

6-22 Periodicals, Web sites, etc.
http://www.nhm.ac.uk/research-curation/research/projects/duxbury/database /
http://www.ucl.ac.uk/GeolSci/micropal/welcome.html

7- Facilities required for teaching and learning:

- Data show
- Sound system to ensure the ease of listening
- Traditional chalk or pen board
- Microscopes
- Lab space equiped with the necessary devices and chemicals for sample processing

Course coordinators:	Prof. Refaat Osman Prof. Gamal El Qot
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419)

updated on 2022/2023

Course Specification
320-G: Marine Geology and Diagenesis

A- Affiliation

Relevant program: Geology B.Sc. Program
Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Third level

B - Basic information

Title: Marine Geology and Diagenesis	**Code:320-G**	**Year/level:** third level
Teaching Hours:	**Lectures:**2	**Tutorial:** 0
	Practical: 2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

- The main objectives of this course are to enable the students to identify the paleo-oceanographic events recorded in the ocean and sea floors, sea-level fluctuations and chemical and physical modification of marine sediments. This course aims also to study the diagenetic stages of sedimentary rocks.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should be able to:

a1- recognize the different paleo-oceanographic events.
a2- identify the various geomorphological submarine features.
a3- distinguish the diagenetic aspects in silicicalstic and carbonate sedimentary rocks.
a4- discriminate the meteoric diagenesis in the vadose and phreatic zones.
a5- recognize the burial diagenesis.

b - Intellectual skills:

On successful completion of the course, the student should be able to:

b1- reconstruct the paleogeographic setting on the paleo oceanic floors.
b2- discriminate the different types of diageneses in sedimentary rocks.
b3- identify the different types of porosity and the influence of diagenesis on the porosity and permeability of sedimentary rocks.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1- identify the main diagenetic features in sedimentary rocks under polarizing microscope.

c2- differentiate the various types of porosity.
c3- interpret the diagenetic history of a sedimentary rocks.
c4- determine the diagenetic types which enhance rock porosity and those reduce it.

d - General skills:

On successful completion of the course, the student should be able to:

d1- Use computer, internet & communications.
d2- Management, working in group & life-long learning.
d3- Ethical behavior, community linked thinking.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction	2	0	2
2- Origin of oceanic basins	2	0	2
3- Paleo-oceanographic events	2	0	2
4- Sea-level fluctuations	2	0	2
5- Physical and chemical modifications to marine sediments	2	0	2
6- Mid-term exam			
7- Diagenetic reactions in the eogenetic realms	2	0	2
8- Diagenetic reactions in the mesogenetic zone	2	0	2
9- Diagenetic reactions in the telogenetic zone	2	0	2
10- Diagenesis of carbonate rocks	2	0	2
11- Regimes of carbonate diagenesis	2	0	2
12- Diagenesis in the meteoric environment	2	0	2
13- Porosity and permeability	2	0	2
14- General revision	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	recognize the different paleo-oceanographic events.	X	0	x	0	0	x
	a2	identify the various geomorphological submarine features.	X	x	0	0	0	0
	a3	distinguish the diagenetic aspects in siliciclastic and carbonate sedimentary rocks.	X	0	0	0	0	x

	a4	discriminate the meteoric diagenesis in the vadose and phreatic zones.	X	x	0	0	X	x
	a5	recognize the burial diagenesis.	X					
Intellectual Skills	b1	reconstruct the paleogeographic setting on the paleooceanic floors.	**X**	0	0	**0**	**X**	**0**
	b2	discriminate the different types of diageneses in sedimentary rocks.	**X**	0	0	**0**	**x**	**x**
	b3	identify the different types of porosity and the influence of diagenesis on the porosity and permeability of sedimentary rocks.	X	0	0	**0**	**X**	**0**
Practical and professional skills	c1	identify the main diagenetic features in sedimentary rocks under polarizing microscope.	X	0	0	0	X	x
	c2	differentiate the various types of porosity.	X	0	0	0	X	x
	c3	interpret the diagenetic history of a sedimentary rocks.	X	0	0	0	x	x
	c4	determine the diagenetic types which enhance rock porosity and those reduce it.						
General Skills	d1	Use computer, internet & communications.	X	x	0	0	0	x
	d2	Management, working in group & life-long learning.	X	x	o	o	o	x
	d3	Ethical behavior, community linked thinking.	X	x	o	o	x	x

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude.
5.2. Assignments to assess the student independent work,
5.3. A field trips.
5.4. Written mid-term exam to ensure the student progress and discover the shortage.
5.5. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, b1, b2, c1, d1	Fifth week	5 %
Mid-Term Exam	a1, a2, b1, b2, c1	Seventh week	5 %
Oral exam	a1, a2, a3, a4, b1, b2, c1, c2, c3	Thirteenth week	10 %
Written exam	a1, a2, a3, a4, a5, b1, b2, b3, c1, c2, c3, c4.	Fourteenth week	80 %
Total			100 %

-Course matrix

Contents	Knowledge and understanding					Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	a5	b1	b2	b3		c1	c2	c3	c4	d1	d2	d3	
Introduction	x							x						x			
Origin of oceanic basins		x			x		x					x					
Paleo-oceanographic events				x													
Sea-level fluctuations			x														
Physical and chemical modifications to marine sediments				x											x		
Diagenetic reactions in the eogenetic realms					x		x				x						
Diagenetic reactions in the mesogenetic zone		x													x		
Diagenetic reactions in the telogenetic zone			x											x			
Diagenesis of carbonate rocks		x			x					x						x	
Regimes of carbonate diagenesis	x							x					x		x		
Diagenesis in the meteoric environment			x				x							x			
Porosity and permeability		x									x					x	

6- List of references:

6-1 Course notes

Manual notes handle of marine geology and diagenesis for students.

6-2 Required books.

6-23 Recommended books

1.Text book: Petrology of sedimentary rocks. Sam Boggs, Jr., Applied sedimentology, Selley R.C.

Periodicals, Web sites, etc.

www.sciencedirect.com&www.geology.com

7- Facilities required for teaching and learning:

Data show

Using a blackboard

Group discussions

Course coordinators: Prof. Emad Sallam

Head of the Department: Prof. Gamal El-Qot

Date: Approved on 9/12/2015 (meeting number 390), updated on 10/1/2018 (meeting number 419),

last updated 2022/2023

Course Specification
325-G: Sedimentary rocks and Depositional Environments

A- Affiliation

Relevant program: Geology B.Sc. Program
Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Third level

B - Basic information

Title: Sedimentary rocks and depositional environments	**Code:325-G**	**Year/level:** third level
Teaching Hours:	**Lectures:** 3	**Tutorial:** 0
	Practical: 3	**Total:** 6 h/week

C - Professional information

1 – Course Learning Objectives:

Sedimentary petrology is the study of sediments and sedimentary rocks. This course specifically deals with the description, classification, and origin of sediments and sedimentary rocks, and with the processes that lead to their formation. It presents and overview of the most common types of depositional environments and it examines the processes that occur from source to sink.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the post-graduate will be able to:

a1. acquired a mechanistic understanding of the processes that affect sediment formation, transport and deposition.

a2. use sediment facies to interpret depositional environments in marine and continental sedimentary systems.

b - Intellectual skills:

On successful completion of the course, the post-graduate will be able to:

b1. identity the concepts and techniques that are a requisite to handle sedimentological problems in the broadest sense and that are also a requisite for adequate research needed for the majority of the master thesis.

c - Practical and professional skills:

On successful completion of the course, the post-graduate will be able to:

c1. design a research project based on sediments and sedimentary archives.

c2. select the most appropriate techniques to analyze sediments for specific purposes, as well as combine and interpret data obtained using several independent techniques.

d - General skills:

On successful completion of the course, the graduate will be able to:

d1. work with peers on small projects,

d2. accomplish given scientific tasks either individually, or with a group,

d3. search via the internet and local libraries to prepare a report on a given subject,

d4. communicate scientific data orally to the audience with the help of technology.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction	3	0	3
2. Sedimentary rocks: gravels, breccias and conglomerates	3	0	3
3. Sandstones	3	0	3
4. Shales and argillite	3	0	3
5. Limestones	3	0	3
6. Chert	3	0	3
7. Evaporates	3	0	3
8. Sedimentary ironstone and iron formation	3	0	3
9. Sedimentary phosphate deposits	3	0	3
10. Sedimentary environments	3	0	3
11. Sedimentary facies	3	0	3
12. Sedimentary models	3	0	3
13. Reefs	3	0	3
14. Turbidites	3	0	3
Total hours	42	0	42

4 - Teaching and Learning methods:

Intended Learning Outcomes			**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Knowledge & Understanding	a1	acquired a mechanistic understanding of the processes that affect sediment formation, transport and deposition.	x	0	x	0	0	x
	a2	use sediment facies to interpret depositional environments in marine and continental sedimentary systems.	x	x	0	0	0	0
Intellectual Skills	b1	identity the concepts and techniques that are a requisite to handle sedimentological problems in the broadest sense and that are	**x**	0	0	**0**	**X**	**0**

		also a requisite for adequate research needed for the majority of the master thesis.						
Practical and professional skills	c1	design a research project based on sediments and sedimentary archives.	x	0	0	0	X	x
	c2	select the most appropriate techniques to analyze sediments for specific purposes, as well as combine and interpret data obtained using several independent techniques.	x	0	0	0	X	x
General Skills	d1	work with peers on small projects.	x	x	0	0	0	x
	d2	accomplish given scientific tasks either individually, or with a group.	x	x	o	o	o	x
	d3	search via the internet and local libraries to prepare a report on a given subject.	x	x	o	o	x	x
	d4	communicate scientific data orally to the audience with the help of technology	x	x	x	o	x	x

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude.
5.2. Assignments to assess the student independent work,
5.3. A field trips.
5.4. Written mid-term exam to ensure the student progress and discover the shortage.
5.5. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1, b1, c1, d1	Fifth week	5 %
Mid-Term Exam	a1, a2, b1, c1	Seventh week	5 %
Oral exam	a1, a2, b1, c1, c2	Thirteenth week	10 %
Written exam	a1, a2, b1, c1, c2	Fourteenth week	80 %
Total			100 %

-Course matrix

contents	Intellectual skills				Practical and professional skills				General skills					
	a1	a2	b1				c1	c2			d1	d2	d3	d4
Introduction	x										x			
Sedimentary rocks: gravels, breccias and conglomerates		x					x							x
Sandstones			x										x	
Shales and argillite									x					
Limestones												x		
Chert								x						
Evaporates		x										x		

Sedimentary ironstone and iron formation			x								x			
Sedimentary phosphate deposits		x					x						x	
Sedimentary environments	x											x		
Sedimentary facies							x				x			
Sedimentary models		x	x					x					x	
Reefs		x												X
Turbidites			x									x		x

6- List of references:

6-1 Course notes

Manual notes handle of sedimentary rocks and depostional systems for students.

6-2 Required books.

none

6-24 Recommended books

1.Text book: Sedimentary Petrology: An Introduction. M. Tucker

6-25 Periodicals, Web sites, etc.

www.sciencedirect.com&www.geology.com

7- Facilities required for teaching and learning:

Data show; Using a blackboard; Group discussions

Course coordinators: Prof. Emad Sallam

Head of the Department: Prof. Gamal El-Qot

Date: Approved on 9/12/2015 (meeting number 390), updated on 10/1/2018 (meeting number 419),

last updated in 2022/2023

Course Specification

333 G: Igneous Petrology

A. Affiliation

Relevant program: Geology B.Sc. Program

Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Third Level

B. Basic information

Title: Igneous Petrology	**Code:**333G	**Year/level:** Third level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course aims to provide students with a thorough understanding of the nature and origin of igneous rocks, from their formation and distribution to their volcanic expressions and association with particular plate tectonic settings and to what extent these features have remained the same or changed with time during the geological history of the Earth. The course also builds on fundamental concepts of geochemistry and mineralogy to explain formation of primary igneous ore bodies. Integral practical classes will use both hand specimens and optical mineralogy to understand diagnostic textures - which are used to identify and classify igneous rocks.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

a1. review the origin of magma and magmatic evolution,
a2. recognize the magmatic minerals and their paragenesis,
a3. demonstrate the optical characteristics to identify mineral components of igneous rocks and their genesis,
a4. identify the geotectonic environment of the different types of igneous rocks.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. assess the concepts, principles, procedures, theories and their interrelationships for interpreting the unique properties and characteristics of igneous rocks and connecting them to economic uses,
b2. deduce appropriate judgments and procedures to handle scientific problems in igneous rocks and rocks identification and exploitation,
b3. provide a petrographic description of igneous rocks, their mineral compositions and textures,
b4. describe the tectonic settings in which igneous rocks occur including a preliminary assessment of volcanic hazard.

c. **Practical and professional skills:**

On successful completion of the course, the student should be able to:

- **c1.** list the different geochronological techniques and their applications and igneous processes,
- **c2.**explain how absolute pressure-temperature information is extracted from rock using thermodynamic expressions,
- **c3.**realize the key factors that govern the diversity of igneous rock compositions,
- **c4.**demonstrate how the occurrence and character of different igneous rock suites is governed by and reflects the Earth's tectonic .

d. General skills:

On successful completion of the course, the student should be able to:

- **d1.** work with peers on small projects,
- **d2.** accomplish given scientific tasks either individually, or with a group,
- **d3.** conduct internet and library search to prepare a report on a given class assignment,
- **d4.**communicate scientific data orally to the class audience with the help of technology aids such as a PowerPoint presentation.

3. Contents

Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
1. General Introduction	2		2
2. Classification of Igneous rocks	2		2
3. Formation of igneous rocks	2		2
4. Plutonism and volcanism	2		2
5. Melting and crystallization	2		2
6. How to study igneous rocks	2		2
7. Geochemistry of igneous rocks	2		2
8. Isotope geochemistry of igneous rocks	2		2
9. Origin and diversification of magmas.	2		2
10. Igneous structures and field relationships	2		2
11. Aqueous solutions at different temperatures.	2		2
12. The Arabian Shield and the main igneous rocks	2		2
13. Igneous structures and environments	2		2
14. Revision and feedback	2		2
Total hours	**28**		**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	review the origin of magma and magmatic evolution,	✓	✓				
	a2.	recognize the magmatic minerals and their paragenesis,	✓			✓	✓	✓
	a3.	demonstrate the optical characteristics to identify mineral components of igneous rocks and their genesis,	✓				✓	
	a4.	identify the geotectonic environment of the different types of igneous rocks.	✓				✓	
Intellectual Skills	b1.	assess the concepts, principles, procedures, theories and their interrelationships for interpreting the unique properties and characteristics of igneous rocks and connecting them to economic uses,				✓		
	b2.	deduce appropriate judgments and procedures to handle scientific problems in igneous rocks and rocks identification and exploitation,					✓	
	b3.	provide a petrographic description of igneous rocks, their mineral compositions and textures	✓		✓			✓
	b4.	describe the tectonic settings in which igneous rocks occur including a preliminary assessment of volcanic hazard.						
Practical and professional skills	c1.	list the different geochronological techniques and their applications and igneous processes,		✓		✓	✓	
	c2.	explain how absolute pressure-temperature information is extracted from rock using thermodynamic expressions,		✓		✓		
	c3.	realize the key factors that govern the diversity of igneous rock compositions,	✓	✓		✓		
	c4.	demonstrate how the occurrence and character of different igneous rock suites is governed by and reflects the Earth's tectonic .				✓		
General Skills	d1.	work with peers on small projects				✓	✓	✓
	d2.	accomplish given scientific tasks either individually, or with a group				✓		

	d3.	conduct internet and library search to prepare a report on a given class assignment				✓	✓	
	d4.	communicate scientific data orally to the class audience with the help of technology aids such as a PowerPoint presentation		✓	✓	✓	✓	✓

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate the students and promote to other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
General Introduction	x						x						x			
Classification of Igneous rocks		x				x					x					x
Formation of igneous rocks				x												
Plutonism and volcanism			x													
Melting and crystallization				x										x		
How to study igneous rocks						x				x						
Geochemistry of igneous rocks		x						x						x		
Isotope geochemistry of igneous rocks			x										x			
Origin and diversification of magmas.		x							x						x	
Igneous structures and field relationships	x						x					x		x		
Aqueous solutions at different temperatures.			x			x							x			
The Arabian Shield and the main igneous rocks		x								x					x	
Igneous structures and environments		x														x
Revision and feedback			x											x		

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructor.
Power point presentations

6.2. Required books.

None

6.3. Recommended books

6.4. Periodicals, Web sites, etc.

http://www.nhm.ac.uk/research-curation/research/projects/duxbury/database /
http://www.ucl.ac.uk/GeolSci/micropal/welcome.html

7. Facilities required for teaching and learning:

- Data show
- Sound system to ensure the ease of listening
- Traditional chalk or pen board
- Microscopes
- Lab space equiped with the necessary devices and chemicals for sample processing

Course coordinator:	Asst.Prof. Abdelazim Rashwan Assis Prof. Moustafa Mogahed
Head of the Department	Prof. Gamal El Qot
Date:	2022/2023

Course Specification

336 G: Egyptian Basement Rocks

A. Affiliation

Relevant program: B. Sc.in Geology Program
Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Third level

B. Basic information

Title: Egyptian Basement Rocks	**Code:336G**	**Year/level:** Third level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course is dedicated to furnishing the student with the understanding how the basement complex formed, the classification and lithologic units of the Egyptian basement. In addition, students will be getting familiar with description of the rock units constituting the basement complex of the Eastern Desert and Sinai.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

- **a1.**identify basics terminology, nomenclature, concepts, theories, laws and classification systems used in the basement rocks,
- **a2.** define methods of interpreting and analyzing basement rocks information,
- **a3.** recognize importance of the basement rocks to economic and environmental issues,
- **a4.** realize the application of basement rocks to the industrial field and others.

B. Intellectual skills:

On successful completion of the course, the student should be able to.

- **b1.** analyze rock units encountered in any given area of the basement rocks of Egypt,
- **b2.** analyze the stratigraphic units in any sedimentary succession in the Egyptian territory,
- **b3.** arrange a stratigraphic correlation in different parts of Egypt.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

- **c1.** assess the geological events that govern the arrangement and stacking of the different stratigraphic units in Egypt,
- **c2.** emphasize the age assignment and general geological history of any given stratigraphic succession in Egypt,

c3. deduce a regional and global correlation between the rock units of Egypt and the surrounding countries.

d. General skills:

On successful completion of the course, the student should be able to:

d1. develop core skills

d2. provide opportunities for independent and cooperative learning procedures with supporting argument.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction and course details	2		2
2. Historical review	2		2
3. Classification of the basement complex in Egypt	2		2
4. Stratigraphic and tectonic units	2		2
5. Rock assemblages along plate boundaries	2		2
6. Application of plate tectonic theory	2		2
7. History of magmatic activities	2		2
8. Tectonic evolution	2		2
9. Detailed description of units of the basement complex	2		2
10. Volcanicity and volcanic rocks	2		2
11. Ophiolitic rocks, gabbroic rocks, and granitoid rocks.	2		2
12. Specimens & thin sections identifications	2		2
13. Mineral deposits associated with basement rocks	2		2
14. Revision and feedback	2		2
Total hours	**28**		**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	Identify basics terminology, nomenclature, concepts, theories, laws and classification systems used in the basement rocks.,	✓	✓				
	a2.	Define methods of interpreting and analyzing basement rocks information.	✓			✓	✓	✓
	a3.	Recognize importance of the basement rocks to economic and environmental issues.	✓				✓	
	a4.	Write applicability of basement rocks to the industrial field and others.	✓				✓	
Intellectual Skills	b1.	analyze rock units encountered in any given area of the basement rocks of Egypt.				✓		
	b2.	analyze the stratigraphic units in any sedimentary succession in the Egyptian territory.					✓	
	b3.	arrange a stratigraphic correlation in different parts of Egypt.	✓		✓			✓
Practical and professional skills	c1.	assess the geological events that govern the arrangement and stacking of the different stratigraphic units in Egypt.						
	c2.	emphasize the age assignment and general geological history of any given stratigraphic succession in Egypt.		✓		✓	✓	
	c3.	deduce a regional and global correlation between the rock units of Egypt and the surrounding countries		✓		✓		
General Skills	d1.	Developing core skills	✓	✓		✓		
	d2.	Providing opportunities for independent and cooperative learning procedures with supporting argument.				✓		

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,

5.2. Assignments to assess the student independent work,

5.3. Written mid-term exam to ensure the student progress and discover the shortage,

5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course details	x						x						x			
Historical review		x				X					x					x
Classification of the basement complex in Egypt				x												
Stratigraphic and tectonic units			x													
Rock assemblages along plate boundaries				x										x		
Application of plate tectonic theory						X				x						
History of magmatic activities		x						x						x		
Tectonic evolution			x										x			
Detailed description of units of the basement complex		x							x						x	
Volcanicity and volcanic rocks	x						x					x		x		
Ophiolitic rocks, gabbroic rocks, and granitoid rocks.			x			X							x			
Specimens & thin sections identifications		x								x					x	
Mineral deposits associated with basement rocks		x														x
Revision and feedback			x											x		

6. List of references:

6.1. Course notes
Lecture notes prepared by the course instructor(s)
Power point presentations

6.2. Required books.
None

6.3. Recommended books
Text Book: Petrology: Igneous, Sedimentary, and Metamorphic
Author: Harvey Blatt, Robert Tracy, and Brent Owens
Publisher: W. H. Freeman; 3rd edition (November 11, 2005), 530 pages

6.4. Periodicals, Web sites, etc.
Geotectonics
http://www.springer.com/earth+sciences+and+geography/geology/journal/11479
http://www.platetectonics.com/book/

7. Facilities required for teaching and learning:
Data show
Sound system to ensure the ease listening
PCs and software
Electronic library

Course coordinators:	Asst.Prof. Abdel Aziem Ahmed Rashwan Asst.Prof. Moustafa M. Mogahed
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification
337 G: Metamorphic Petrology

A. Affiliation

Relevant program: B. Sc.in GeologyProgram

Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Third Level

B. Basic information

Title: Metamorphic Petrology	**Code:**337G	**Year/level:** Third level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This Course is dedicated to furnishing the student with the necessary basic information about the 1) classification and identification of metamorphic rocks, 2) genesis of metamorphic rocks, 3) phase diagrams in metamorphic petrology, and 4) melting and crystallization.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

a1.provide a brief account on the different types of metamorphic rocks,
a2. recognize the difference between the different metamorphic rocks,
a3.identify the pressure temperature controls associated with the various types of metamorphic rocks,
a4. realize the stratigraphic value and range of application of the major metamorphic types.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Initiate cognitive skill to generate the abilities of identifying the physical properties of metamorphic rocks, facies, and minerals,
b2. deal with optic characteristics to identify, interpret the mineral. bearing of the rocks, and analysing its genesis,
b3.describe the basic morphologic features of the different metamorphic groups with emphsis on palynomorphs,
b4. Develop the ability to make detailed maps in areas of metamorphic terrains.

c. Practical and professional skills:

On successful completion of the course, the student should be able to:

- **c1.** Process metamorphic rock samples for their fossil palynomorph content,
- **c2.**Employ metamorphics to provide information about the stratigraphy of their enclosing metamorphic rocks,
- **c3.**Utilize metamorphics as a proxy to interpret the formation conditions of rock types,
- **c4.**Reconstruct the geologic history of deformed rocks based on their metamorphic content.

d. General skills:

On successful completion of the course, the student should be able to:

- **d1.** Work with peers on small projects,
- **d2.** Accomplish given scientific tasks either individually, or with a group,
- **d3.** Make an internet and library search to prepare a report on a given class assignment,
- **d4.** Communicate scientific data orally to the class audience with the help of technology aids such as a PowerPoint presentation.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. General Introduction	2		2
2. Classification of metamorphic rocks	2		2
3. Formation of metamorphic rocks	2		2
4. Plutonism and volcanism	2		2
5. Melting and crystallization	2		2
6. How to study metamorphic rocks	2		2
7. Geochemistry of metamorphic rocks	2		2
8. Isotope geochemistry of metamorphic rocks	2		2
9. Different types of Metamorphism	2		2
10. Metamorphic Reaction	2		2
11. Metamorphic Facies	2		2
12. Metamorphism and Mineralization	2		2
13. Metamorphic structures and environments	2		2
14. Revision and feedback	2		2
Total hours	**28**		**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes	Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming

Knowledge & Understanding	a1.	Be able to provide a brief account on the different types of micro fossils including palynomorphs	✓	✓				
	a2.	Be able to recognize the difference between the different metamorphic groups-particularly palynomorphs	✓	✓	✓	✓		
	a3.	identity the paleoenvironmental controls associated with the various types of metamorphics, principally palynomorphs	✓	✓		✓	✓	✓
	a4.	Realize the stratigraphic value and range of application of the major metamorphic types specially palynomorphs	✓	✓		✓	✓	✓
Intellectual Skills	b1.	Initiate cognitive skill to generate the abilities of identifying the physical properties of metamorphic rocks, facies, and minerals,	✓	✓		✓		✓
	b2.	deal with optic characteristics to identify, interpret the mineral- bearing of the rocks, and analyzing its genesis,		✓		✓		
	b3.	describe the basic morphologic features of the different metamorphic groups with emphsis on palynomorphs,	✓	✓	✓	✓		
	b4.	Develop the ability to make detailed maps in areas of metamorphic terrains.		✓		✓		
Practical and professional skills	c1.	Process metamorphic rock samples for their fossil palynomorph content	✓	✓		✓		
	c2.	Employ metamorphics to provide information about the stratigraphy of their enclosing metamorphic rocks	✓	✓			✓	✓
	c3.	Utilize metamorphics as a proxy to interpret the depositional paleoenvironment of rock layers	✓	✓			✓	✓
	c4.	Reconstruct the geologic history of stratified rocks based on their metamorphic content			✓		✓	✓
General Skills	d1.	Work with peers on small projects		✓	✓	✓	✓	✓
	d2.	Accomplish given scientific tasks either individually, or with a group		✓	✓	✓	✓	✓
	d3.	Make an internet and library search to prepare a report on a given class assignment		✓	✓	✓	✓	
	d4.	Communicate scientific data orally to the class audience with the help of technology aids such as a PowerPoint presentation		✓	✓			

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,

5.2. Assignments to assess the student independent work,

5.3. Written mid-term exam to ensure the student progress and discover the shortage,

5.4. Final written and oral exam to evaluate the students and promote to other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester Work	a1, a2, a3, a4, b1, b2, b3, b4, c1, d1, d2, d3, and d4	Whole semester	5 %
Mid-Term Exam	a1, a2, a3, a4, b3, and b4	Seventh week	5 %
Oral exam	a1, a2, a3, and a4	Thirteenth week	10 %
Practical exam	b2, b3, and b4	Thirteenth week	20
Written exam	a1, a2, a3, a4, and b3	Fourteenth week	60 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
General Introduction	x						x						x			
Classification of metamorphic rocks		x				x					x					x
Formation of metamorphic rocks				x												
Plutonism and volcanism			x													
Melting and crystallization				x										x		
How to study metamorphic rocks						x				x						
Geochemistry of metamorphic rocks		x						x						x		
Isotope geochemistry of metamorphic rocks			x										x			
Different types of Metamorphism		x							x						x	
Metamorphic Reaction	x						x					x		x		
Metamorphic Facies			x			x							x			
Metamorphism and Mineralization		x								x					x	
Metamorphic structures and environments		x														x
Revision and feedback			x											x		

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructor.
Power point presentations

6.2. Required books.

None

6.3. Recommended books

None

6.4. Periodicals, Web sites, etc.

http://www.nhm.ac.uk/research-curation/research/projects/duxbury/database /
http://www.ucl.ac.uk/GeolSci/micropal/welcome.html

7. Facilities required for teaching and learning:

- Data show
- Sound system to ensure the ease of listening
- Traditional chalk or pen board
- Microscopes
- Lab space equiped with the necessary devices and chemicals for sample processing

Course coordinator:	Asst.Prof. Abdel Aziem M. Mehanna Asst.Prof. Moustafa M. Mogahed
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification
340 G: Rock Mechanics and Structural Geology

A- Affiliation

Relevant program: Geology B.Sc. Program
Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Third level

B - Basic information

Title: Rock Mechanics and Structural Geology	**Code:340 G**	**Year/level:** Third level
Teaching Hours:	**Lectures:**3	**Tutorial:** 0
	Practical:2	**Total:** 5 h/week

C - Professional information

1 – Course Learning Objectives:

This course is dedicated to introducing students to concepts and geological applications of rock deformation. It also aims to familiarize students with the fundamentals of both the structural geology and rock mechanics. In this course, students will be encouraged to use available field-structural data in deciphering structural history of an area.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a1.study the geologic structures and rock properties,
a2. recognize non-tectonic- and tectonic-structures, and different failure mechanisms,
a3. demonstrate the geometric and kinematic relationships of geologic structures,
a4. analyze the collected structural data from planar and linear structures,
a5. decide the suitable method/criterion to determine/estimate the deformation and failure behaviour of the rock.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. differentiate between ductile and brittle structures,
b2. use overprinting relations in unraveling the polyphase deformation,
b3.demenostsate the basic and progressed techniques in structural mapping,
b4.recognize the characterisitic features of various kinds of structural fabrics.
b5. relate software and hardware in structural analysis.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. interpret structural history of an area,

c2. analyze the directional data,

c3. use the different software and apply methods to polyphase deformation history,

c4. read geologic and structural maps.

d - General skills:

On successful completion of the course, the student should be able to:

d1. collect data from textbooks and other resources,

d2. transfer the projected goals to findings using available data and software and formulate the results in an easily readable final form,

d3. cooperate and work in team smoothly while managing the time and go to point and targeted goals.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction to rock mechanics	3	0	2
2. Failure mechanisms of rocks	3	0	2
3. Non-tectonic structures	3	0	2
4. Rock behavior and deformation	3	0	2
5. Rock response to stress	3	0	2
6. Strain (plastic deformation) and strain markers	3	0	2
7. Measuring rock deformation	3	0	2
8. Folding and plastic deformation	3	0	2
9. Folding mechanisms (Buckling and bending)	3	0	2
10. Fracturing and brittle deformation	3	0	2
11. Anderson Faulting Theory	3	0	2
12. Faults and fault mechanisms	3	0	2
13. Shear zones	3	0	2
14. Stress and strain regimes	3	0	2
Total hours	**42**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowl	a1	study the geologic structures and rock properties,	x	0	x	0	0	x

	a2	recognize non-tectonic- and tectonic-structures, and different failure mechanisms,	x	0	0	x	0	0
	a3	demonstrate the geometric and kinematic relationships of geologic structures,	x	0	0	x	0	x
	a4	analyze the collected structural data from planar and linear structures,	x	x	0	x	X	x
	a5	decide the suitable method/criterion to determine/estimate the deformation and failure behavior of the rock.	x	0	x	0	0	X
Intellectual Skills	b1	differentiate between ductile and brittle structures	**x**	0	0	**0**	**X**	**0**
	b2	use overprinting relations in unraveling the polyphase deformation	**x**	0	0	**x**	**x**	**0**
	b3	demonstrate the basic and progressed techniques in structural mapping	x	x	x	**x**	**X**	**0**
	b4	recognize the characteristic features of various kinds of structural fabrics	x	0	0	**x**	**x**	**0**
	b5	relate software and hardware in structural analysis	x	0	0	**x**	**0**	**0**
Practical and professional	c1	interpret structural history of an area,	x	0	x	x	X	x
	c2	analyze directional data,	0	0	x	x	X	0
	c3	use the different software and apply methods to polyphase deformation history,	0	0	0	x	x	x
	c4	read a geologic and structural map.	0	0	x	**x**	**X**	**0**
General Skills	d1	collect data from textbooks and other resources,	x	x	0	0	0	x
	d2	transfer the projected goals to findings using available data and software and formula the results in an easily readable final form,	x	x	o	o	o	x
	D3	cooperate and work in team smoothly while managing the time, and go to point and targeted goals	x	x	o	o	x	x

5- Students' Assessment Methods and Grading:

5.1. Discussion, class participation and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a3, b2, and d1	Fifth week	10 %
Mid-Term Exam	a1, a5, b3, b4.	Seventh week	10 %
Oral exam	a2, a3, a4, a5, b5, b1, c2, c3	Thirteenth week	10 %
Written exam	a1, a2, a3, a5, b1, b2, b4, b5, c1, c2, c3, d1.	Fourteenth week	70 %
Total			100 %

-Course matrix

Contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to rock mechanics	x						x						x			
Failure mechanisms of rocks		x				x					x					x
Non-tectonic structures				x												
Rock behavior and deformation			x													
Rock response to stress				x										x		
Strain (plastic deformation) and strain markers						x				x						
Measuring rock deformation		x						x						x		
Folding and plastic deformation			x										x			
Folding mechanisms (Buckling and bending)		x							x						x	
Fracturing and brittle deformation	x						x					x		x		
Anderson Faulting Theory			x			x							x			
Faults and fault mechanisms		x								x					x	
Shear zones		x														x
Stress and strain regimes			x											x		

6- List of references:

6-1 Course notes

Lecture notes prepared by the course instructor(s)
Power point presentations

6-2 Required books.

None

6-3 Recommended books

-Fossen, H. (2010) Structural geology. Cambridge University Press, London.
-Rock mechanics on a geological base, R. Pusch, Elsevier.
-Structural geology of rocks and regions, G. Davis and S. Reynolds.

6-4 Periodicals, Web sites, etc.

Journal of Structural Geology
Egyptian Journal of Geology
http://gdex.cr.usgs.gov/gdex/
Hamimi, Z. (2006) Principles of structural geology (Arabic Edition). Hebet El-Nil El-Arabiya, Cairo.

7- Facilities required for teaching and learning:

Data show
Sound system to ensure the ease listening
Using a white board
Group discussions

Course coordinator(s):	Prof. Maher El-Amawy Prof. Zakaria Hamimi
Head of the Department:	Prof. Gamal El Qot
Date:	2022/2023

Course Specification
345 G: Principles of Structural Geology

A- Affiliation

Relevant program: B.Sc. in Geology

Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Third level

B - Basic information

Title: Principals of Structural Geology	**Code: G 345**	**Year/level:** Third level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical: 2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is designed to introduce students to concepts of rock deformation, familiarize students with the fundamentals of structural geology, and to encourage the use of non-tectonic primary structures in determining facing (younging direction) and tectonic secondary structures in structural analysis.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a1. study the various kinds of geologic structures,
a2. recognize primary igneous and sedimentary structures at outcrop-scale.
a3. demonstrate the importance of geologic structures in geologic studies
a4. analyze the collected oriented data,
a5. decide the relation of minor structures to major structures,

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. differentiate between undeformed and deformed lithologies,
b2. use the geologic structures in deducting geologic history
b3. demonstrate the map-patterns of geologic structures,
b4. recognize the overprinting relations between successive structures
b5. relate structural fabrics to deformation episodes

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. interpret structural maps
c2. analyze the orientational structural data,

c3. use the different software to plot attitudes of planar and linear structures.
c4. contribute in developing the available techniques, software and sensors.

d - General skills:

On successful completion of the course, the student should be able to:

d1. collect data and observations from geologic structures,
d2. transfer the projected goals to findings using available data and software and formula the results in an easily readable final form,
d3. cooperate and work in team smoothly while managing the time and go to point and targeted goals.

3 – Content

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction and course description	2	0	2
2. Classification of geologic structures	2	0	2
3. Primary sedimentary structures	2	0	2
4. Primary igneous structures	2	0	2
5. Diapiric structures	2	0	2
6. Impact structures	2	0	2
7. Intrusive and Extrusive Structures	2	0	2
8. Gravity-controlled structures	2	0	2
9. Folding and folding mechanisms	2	0	2
10. Map View of Non-plunging- and Plunging-folds	2	0	2
11. Foliations and lineation	2	0	2
12. Fractures	2	0	2
13. Field criteria of faulting	2	0	2
14. Revision and feedback	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	study the various kinds of geologic structures,	x	0	0	x	0	x
	a2	recognize primary igneous and sedimentary structures at outcrop-scale	x	x	0	x	0	0
	a3	demonstrate the importance of geologic structures in geologic studies	x	x	0	x	0	x

	a4	analyze the collected oriented data,	x	0	0	x	X	x
	a5	decide the relation of minor structures to major structures,	x	0	0	x	0	0
Intellectual Skills	b1	differentiate between undeformed and deformed lithologies,	**x**	0	0	**x**	**0**	**0**
	b2	use the geologic structures in deducting geologic history	**x**	x	0	**0**	**x**	**x**
	b3	demonstrate the map-patterns of geologic structures,	0	0	0	**x**	**X**	**0**
	b4	recognize the overprinting relations between structural successions	x	0	0	**x**	**x**	**x**
	b5	relate structural fabrics to deformation episodes	x	0	0	**x**	**0**	**x**
Practical and professional skills	c1	interpret structural maps	0	0	0	x	X	x
	c2	analyze the orientational structural data,	0	0	0	x	0	x
	c3	use the different software to plot attitudes of planar and linear structures.	x	0	0	x	x	0
	c4	contribute to developing the available techniques, software and sensors.	x	0	0	**x**	**X**	**0**
General Skills	d1	collect data and observations from geologic structures,	x	x	0	x	0	0
	d2	transfer the projected goals to findings using available data and software and formula the results in an easily readable final form,	x	x	o	o	o	x
	D3	cooperate and work in team smoothly while managing the time and go to point and targeted goals.	x	x	o	o	x	x

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a3, b2, and d1	Fifth week	5 %
Mid-Term Exam	a1, a5, b3, b4.	Seventh week	5 %
Oral exam	a2, a3, a4, a5, b5, b1, c2, c3	Thirteenth week	10 %
Written exam	a1, a2, a3, a5, b1, b2, b4, b5, c1, c2, c3, d1.	Fourteenth week	80 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course description	x						x						x			
Classification of geologic structures		x				x					x					x
Primary sedimentary structures				x												
Primary igneous structures			x													
Diapiric structures				x										x		
Impact structures						x				x						
Intrusive and Extrusive Structures		x						x						x		
Gravity-controlled structures			x										x			
Folding and folding mechanisms		x							x						x	
Map View of Non-plunging- and Plunging-folds	x						x					x		x		
Foliations and lineation			x			x							x			
Fractures		x								x					x	
Field criteria of faulting		x														x
Revision and feedback			x											x		

6- List of references:

6-1 Course notes

Lecture notes prepared by the course instructor(s)
Power point presentations

6-2 Required books.

None

6-3 Recommended books

-Park, R.G. (2005) Foundations of structural geology. Blackie & Son Limited, Chapman and Hall, New York.
- Structural geology of rocks and regions, G. Davis and S. Reynolds.

6-4 Periodicals, Web sites, etc.

Journal of Structural Geology
Open Journal of Geology and Tectonics
Egyptian Journal of Geology

7- Facilities required for teaching and learning:

Data show
Sound system to ensure the ease listening
Using a whiteboard
Group discussions

Course coordinator(s):	Prof. Zakaria Hamimi Prof. Wael Hagag
Head of the Department:	Prof. Gamal El Qot
Date:	2022/2023

Course Specification

365 G: Hydrogeology

A- Affiliation

Relevant program: **B.Sc. in Geology**

Department offering the program: **Department of Geology**

Department offering the course: **Department of Geology**

Academic year/level: **Third level**

B - Basic information

Title: Hydrogeology	**Code:365G**	**Year/level:** third level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is designed to master fundamental qualitative and quantitative principles of hydrogeology, and to define locations of hydrogeologic data and how to use them in hydrologic investigations. The students should therefore be able to assess how hydrogeology is interrelated with other natural and environmental science disciplines.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a1. approach and solve basic problems in the field of hydrogeology,

a2. explore locations of hydrogeology data and how to use them in hydrologic investigations,

a3. realize how hydrogeology is interrelated with other natural and environmental science disciplines,

a4. recognize the methods and techniques used in interpetation of the hydrogeology data.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Investigate the distribution undergroundwater.

b2. analyze hydrologic processes, particularly the processes of precipitation, evaporation, infiltration, and runoff.

b3. explore methods of hydrologic analysis, including aquifer types, groundwater movement, pumping tests and determination of aquifer hydraulic properties, well design.

b4. envisage methods of hydrologic design, including design of flow chart.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. acquire substantial quantities of information, process it effectively, and draw appropriate conclusions,

c2. report accurate observations and measurements,
c3. analyze the various geological and structural issues of aquifers,
c4. carry out scientific research and evaluate and make use of the material so acquired,

d - General skills:
On successful completion of the course, the student should be able to:
d1. work productively with others,
d2. communicate effectively in writing,
d3. organize and manage working time, schedule tasks, and meet deadlines,
d4. Use computer, internet & communications.
d5. adhere to ethical and community linked thinking.

3 – Contents

Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
1- Introduction and course description	2	0	2
2- The hydrologic cycle	2	0	2
3- Stream flow and drainage system	2	0	2
4- Stream flow and hydrograph analyses	2	0	2
5- Rocks and water, porosity, and Hydraulic conductivity	2	0	2
6- Aquifer types and confining beds	2	0	2
7- Groundwater velocity, Transmissivity & storage coefficient	2	0	2
8- Groundwater movement, groundwater flow net	2	0	2
9- Cone of depression, aquifer boundaries & well interference	2	0	2
10- Analysis of aquifer test data	2	0	2
11- Time-drawdown analysis	2	0	2
12- Distance-drawdown analysis	2	0	2
13- Water-well design	2	0	2
14- Revision and Feedback	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Kn ow led	a1	approach and solve basic problems in the field of hydrogeology,	x	x	0	0	0	x

	a2	explore locations of hydrogeology data and how to use them in hydrologic investigations,	x	0	0	0	X	x
	a3	realize how hydrogeology is interrelated with other natural and environmental science disciplines,	x	0	0	0	X	x
	a4	recognize the methods and techniques used in interpetation of the hydrogeology data.,	x	x	0	0	0	x
Intellectual Skills	b1	investigate the distribution and migration of undergroundwater.	x	0	0	0	X	x
	b2	analyze hydrologic processes, particularly the processes of precipitation, evaporation, infiltration, and runoff.	x	0	0	0	X	x
	b3	Explore methods of hydrologic analysis, including aquifer types, groundwater movement, and aquifer hydraulic properties	x	x	0	0	0	x
	b4	envisage methods of hydrologic design, including design of flow chart.	x	x	0	0	0	x
Practical and professional skills	c1	acquire substantial quantities of information, process it effectively, and draw appropriate conclusions,	x	0	0	0	X	x
	c2	make and record accurate observations and measurements,	x	0	0	0	X	x
	c3	report accurate observations and measurements,	x	x	0	0	0	x
	c4	analyze the various geological and structural issues of aquifers,	x	x	0	0	0	x
	c5	carry out scientific research and evaluate hydrogeologic issues.	x	0	0	0	x	x
General Skills	d1	work productively with others,	x	x	0	0	0	x
	d2	communicate effectively in writing,	x	x	0	0	0	x
	d3	organize and manage working time, schedule tasks, and meet deadlines,	x	x	0	0	0	x
	d4	Use computer, internet & communications.	x	x	0	0	0	x
	d5	adhere to ethical and community linked thinking	x	x	0	0	0	x

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a3, b2, and d1	Fifth week	5 %
Mid-Term Exam	a1, b2.	Seventh week	5 %
Oral exam	a2, a3, a4, b1, c2, c3	Thirteenth week	10 %
Written exam	a1, a2, a3, b1, b2, c1, c2, c3, d1.	Fourteenth week	80 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course description	x						x						x			
The hydrologic cycle		x				x					x					x
Stream flow and drainage system				x												
Stream flow and hydrograph analyses			x													
Rocks and water, porosity and Hydraulic conductivity				x										x		
Aquifer types and confining beds						x				x						
Groundwater velocity, Transmissivity & storage coefficient		x						x						x		
Groundwater movement, groundwater flow net			x										x			
Cone of depression, aquifer boundaries & well interference		x							x						x	
Analysis of aquifer test data	x						x					x		x		
Time-drawdown analysis			x			x							x			
Distance-drawdown analysis		x								x					x	
Water-well design		x														x
Revision and Feedback			x											x		

6- List of references:

6-1 Course notes
Course notes prepared by the course instructor(s) and approved by the Department council.
6-2 Required books.
None
6-5 Recommended books
Basic ground-water hydrology (1987) By RALPH C. HEATH Library of Congress Cataloging in Publication Data Geological Survey water-supply paper; 2220.
Groundwater resource development Hamill, L. and Bell, F.G., (1986): British Library, ISBN 0-408-01409-1, pages. 253.
Hydrology Principles, Analysis, Design Revised 2nd edition Author: H. M. Raghunath Copyright © 2006 New Age International (P) Ltd., Publishers Published by New Age International (P) Ltd., Publishers pages 463.

6-6 Periodicals, Web sites, etc.
www.google.com & www.scincedirect.com

7- Facilities required for teaching and learning:
Data show: Power point presentations
Sound system to ensure the ease listening
Using a blackboard

Course coordinator:	Prof. Dr. Mohamed El-Fakharany / Dr. Nehad Mahmoud
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification
319 Ch: Petroleum and petrochemistry

A. Affiliation

Relevant program:	**B.Sc. in Geology**
Department offering the program:	**Department of Geology**
Department offering the course:	**Department of Chemistry**
Academic year/level:	**Third level**

B. Basic information

Title: Petroleum and petrochemistry	**Code:**319Ch	**Year/level:** Third level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:3	**Total:**5 h/week

C. Professional information

1. Course Learning Objectives:

The objective of this course is to enable the students to understand general properties of the Petroleum and petrochemistry such as its origin, physical properties, separation processes, conversion processes and termination processes. Also, teach students the industery of petrochemistry and its application such as deteergents and polymers.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Illustrate the origin of petroleum.
a2. Describe the petroleum composition of petroleum oil.
a3. Outline the physical properties of the oil.
a4. Recognize the separation, conversion and treating processes.
a5. Mention some of the current issues of application in petrochemical industry.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Differentiate between the different types of petroleum.
b2. Analyze the chemical composition of petroleum.
b3. Point out different concepts in petroleum chemical processes.
b4. Analyze chemical treatment of the petroleum according to its composition.
b5. Distinguish between the different types of industrial products.

c. Practical and professional skills:

On successful completion of the course, the student should be able to:

c1. Investigate the chemical properties of chemical compounds.
c2. Design the methods to determine the chemical composition of some organic compounds.

c3. Predict the chemical composition of these compounds.
c4. Identify the chemical composition of this compound.

d. General skills:

On successful completion of the course, the student should be able to:

d1. Use computers and internet for information and communication technology. effectively.

d2. Solve problems on the scientific basis taught in this course.

d3. Search for new information about the new techniques.

d4. Discover the important of the petrochemistry industry in our life.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction to petroleum chemistry.	2		3
2. The theory of the origin of petroleum.	2		3
3. Prospecting for petroleum and gas fields.	2		3
4. Chemical composition of petroleum.	2		3
5. Physical properties of the petroleum and its products.	2		3
6. Petroleum processing.	2		3
7. Mid-Term Exam.	2		3
8. Separation processes.	2		3
9. Conversion processes.	2		3
10. Refining process	2		3
11. Treating process.	2		3
12. Revision of main petroleum process	2		3
13. The petrochemistry and its important.	2		3
14. Petrochemistry products.	2		3
Total hours	**28**		**42**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	Illustrate the origin of petroleum.	✓		✓			✓
	a2.	Describe the petroleum composition of petroleum oil.	✓	✓				
	a3.	Outline the physical properties of the oil.	✓		✓		✓	✓
	a4.	Recognize the separation, conversion and treating processes.	✓		✓		✓	✓
	a5.	Mention some of the current issues of application in petrochemical industry.	✓		✓			✓
Intellectual Skills	b1.	Differentiate between the different types of petroleum.	✓		✓		✓	✓
	b2.	Analyze the chemical composition of petroleum.	✓		✓			✓
	b3.	Point out different concepts in petroleum chemical processes.	✓		✓		✓	✓
	b4.	Analyze chemical treatment of the petroleum according to its composition.	✓		✓		✓	✓
	b5.	Distinguish between the different types of industrial products.	✓	✓	✓		✓	✓
Practical and professional skills	c1.	Investigate the chemical properties of chemical compounds.	✓		✓	✓	✓	✓
	c2.	Design the methods to determine the chemical composition of some organic compounds.	✓		✓	✓	✓	✓
	c3.	Predict the chemical composition of these compounds.	✓		✓	✓	✓	✓
	c4.	Identify the chemical composition of these compounds.	✓		✓	✓	✓	✓
General Skills	d1.	Use computers and internet for information and communication technology effectively.	✓					✓
	d2.	Solve problems on the scientific basis taught in this course.	✓		✓		✓	✓
	d3.	Search for new information about the new techniques.	✓		✓			✓
	d4.	Discover the important of the petrochemistry industry in our life.	✓					✓

5. Students' Assessment Methods and Grading:

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a3, b2, c1 and d1	Fifth week	5 %
Mid-Term Exam	a1, a2, a3, b2, c1, d1, and d2	Seventh week	5 %
Oral exam	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, and d4	Thirteenth week	10 %
Written exam	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, c3, c4, d1, and d4	Fourteenth week	80 %
Total			100 %

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructor(s)Approved from Chemistry Department.

6.2. Required books.

James G. Speight, The Chemistry and Technology of Petroleum, 4thEdn., Taylor & Francis Group, LLC2006.

6.3. Recommended books

1-Petroleum Refining Processes, James G. Speight and BakiÖzüm.

2- Introduction to Process Control, Jose A. Romagnoli and AhmetPalazoglu.

3- Synthetics, Mineral Oils, and Bio-Based Lubricants: Chemistry and Technology, edited by Leslie R. Rudnick.

http://www.greatachievements.org/?id=3675

http://www.cippe.com.cn/2013/en/

7. Facilities required for teaching and learning:

Using a microphone in lectures

Using of slit overhead projector

Using a black board

Group Discussions

Data show

Course coordinator: Asst. Prof. Mohamed Abd El-Rahman Abo Riya

Head of the Department: Prof. Dr. Wagdy Eldougdoug

Date: 2022-2023

Course Specification

339 Ch: Physical chemistry

A. Affiliation

Relevant program: Geology BSc Program

Department offering the program: Department of Geology

Department offering the course: Department of Chemistry

Academic year/level: Third level

B. Basic information

Title: Physical chemistry	**Code:** 339 Ch	**Year/level:** Third level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical: 3	**Total:**5h/week

C. Professional information

1. Course Learning Objectives:

The objective of this course is to enable the students to understand the difference between kinitic and themodynamic, the catalysis science, the meaning of rate of reaction, factors affecting on the rate , the order of reaction and its types. Also,the molecularity , types of catalysis, mechanism of reaction and theories of reacion.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Define the rate, molecularity, rate law, order of reaction and catalyst.
a2. Describe types of order reaction and catalyst.
a3. Discover factors effect on the rate of reaction.
a4. Recognize the mechanism of reaction.
a5. Mention some of theories of reaction.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Differentiate between the different types of order of reaction and catalyst.
b2. Analyze the chemical data to write the rate law of reaction.
b3. Point out different factors effect on the rate of reaction.
b4. Illustrate the effect of temperature on the rate of reaction.

c. Practical and professional skills:

On successful completion of the course, the student should be able to:

c1. calculate the order of reaction.
c2. Apply the knowledge that the student studied to design mechanism for chemical reaction

d - General skills:

On successful completion of the course, the student should be able to:

d1. Use computers and internet for information and communication technology effectively.

d2. Solve problems on the scientific basis taught in this course.

d3. wok in a team effectively, manage time and communicate with others positively.

d4. Discover the important of the chemical kinetics and catalyst in our life.

3. Contents

Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
15. Introduction to chemical kinetic and catalysis.	2		3
16. The rate of reaction and Rate law	2		3
17. Types of catalysis	2		3
18. Order of reaction	2		3
19. Components of catalyst	2		3
20. Methods used in determining the order of reaction.	2		3
21. Mid-Term Exam.	2		3
22. Arrhenius equation	2		3
23. Mechanism of reaction	4		6
24. Preparation of catalyst	4		6
25. Collision theory and Transition state theory	2		3
26. Enzyme catalysis	2		3
Total hours	**28**		42

4. Teaching and Learning methods:

Intended Learning Outcomes			**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Knowledge & Understanding	a1.	Define the rate, molecularity, rate law, order of reaction and catalyst	✓	✓	✓	✓		
	a2.	Describe types of order reaction and catalyst.	✓	✓			✓	
	a3.	Discover factors effect on the rate of reaction	✓	✓	✓	✓		✓
	a4.	Recognize the mechanism of reaction.	✓		✓		✓	✓
	a5.	Mention some of theories of reaction.	✓		✓			✓
Intellectual Skills	b1.	Differentiate between the different types of order of reaction and catalyst	✓	✓	✓		✓	✓
	b2.	Analyze the chemical data to write the rate law of reaction.	✓	✓	✓	✓	✓	✓

	b3.	Point out different factors effect on the rate of reaction.	✓	✓	✓			✓
	b4.	Illustrate the effect of temperature on the rate of reaction.	✓		✓	✓	✓	✓
Practical and	c1.	Calculate the order of reaction.	✓		✓		✓	✓
	c2.	Apply the knowledge that the student studied to design mechanism for chemical reaction	✓		✓		✓	✓
General Skills	d1.	Use computers and internet for information and communication technology effectively.	✓			✓		✓
	d2.	Solve problems on the scientific basis taught in this course.	✓		✓		✓	✓
	d3.	wok in a team effectively, manage time and communicate with others positively	✓		✓			✓
	d4.	Discover the important of the chemical kinetic and catalyst in our life.	✓		✓	✓		✓

5. Students' Assessment Methods and Grading:

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a3, b1, b2, b3 c1, d1 and d3	Fifth week	5 %
Mid-Term Exam	a1, a2, a3, b1, b2, b3 c1 and d2	Seventh week	5 %
Oral exam	a1, a2, a3, a4, a5, b1, b2, b3, b4, c1, c2, d2 and d4	Thirteenth week	10 %
Written exam	a1, a2, a3, a4, a5, b1, b2, b3, b4, b5, c1, c2 and d2	Fourteenth week	80 %
Total			100 %

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructor(s) Approved from Chemistry Department.

6.2. Required books.

Margaret Robson Wright, An Introduction to Chemical Kinetics, John Wiley & Sons Ltd 2004.

6.3. Recommended books

1) P.V. Kamat, D. Meisel, Studies in Surface Science and Catalysis, Vol. 103; Semiconductor Nanoclusters—Physical, Chemical, and Catalytic Aspects, Elsevier: Amsterdam, 1997.
2) Reaction Kinetics, M. J. Pilling and P. W. Seakins
3) Chemical Kinetics, K. J. Laidler
1) P.R. Bevington, D.K. Robinson,,McGraw-Hill,Boston,1992.

6.4. Periodicals, web sites, etc.

1. http://www.chm.davidson.edu/vce/Kinetics/index.html

   - Virtual Chemistry Experiments – Chemical Kinetics
2. http://www.chem.arizona.edu/~salzmanr/480a/480ants/chemkine.html

   - Notes about Chemical Kinetics
3. http://www.chem.uci.edu/undergrad/applets/sim/simulation.htm

   - Chemical Kinetic Simulation
4. http://www.tutorvista.com/content/chemistry/chemistry-iv/chemical-kinetics/rate-of-reaction.php

   - Rate of reaction animation

7. Facilities required for teaching and learning:

Using a microphone in lectures
Using a white board
Group Discussions
Data show

Course coordinator: Dr. Salah Ahmed Ibrahem Eid

Head of the Department: Prof. Dr. Wagdy Eldougdoug
Date: 2022-2023

Course Specification

352 Ph: **X**-Rays diffraction and applications

A. Affiliation

Relevant program:	B.Sc. in Geology Program
Department offering the program:	Department of Geology
Department offering the course:	Physics
Academic year/level:	Third level

B. Basic information

Title: X- Rays diffraction and applications	**Code:**352 Ph	**Year/level:** third level
Teaching Hours:	**Lectures:**3	**Tutorial: 0**
	Practical:0	**Total:** -3 h/week

C. Professional information

1. Course Learning Objectives:

By Finishing of this course the graduate will able to

Understanding the crystal structure according to the diffraction theory , know how to estimate the diffraction angle and beam intinsity . study the charge particles diffraction . using computer to analyze the reciperocal and unit cell of crystal structure

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Describe the crystal structure.

a2. Tell about beam diffraction.

a3. Recognize the relation between the nature of Incident beam and crystal dimensions.

a4. memorize the physical properties of X-Ray.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Compare the crystal structure of different materials.

b2. Collect lot of information about the nature of diffraction beams

b3. Classify the types of diffraction according to the wavelength.

b4. Assess according to the computer data, what is the unit cell

c. Practical and professional skills:

On successful completion of the course, the student should be able to.

c1. Sketch the crystal structure and reciprocal cell.

c2.use computer to study some crystal

c3. analyze the data from X- Ray diffraction.

d. General skills:

On successful completion of the course, the student should be able to.

d1. How to calculate the diffraction angles according the beam energy

d2. Communicate to work efficiently in a team or separately.

d3. Collect data and wrighting reports in the different model of atomic structure and method of diffraction.

3. Contents

No.	Topic	Lecture hours	Tutorial hours	Practical hours
1.	Theory of diffraction	3		0
2.	Crystal structure and reciprocal cell	3		0
3.	X-Ray production and the method of detection	5		0
4.	X-Ray camera receiver	3		0
5.	Estimating the intensity of diffraction beams	5		0
6.	Angles of diffraction	3		0
7.	Mid Term Exam	5		0
8.	Electron and neutron diffraction	3		0
9.	Calculating the energy of diffraction for particles	3		0
10	Diffraction pattern of x-ray	3		0
11	Study the unite cell using Computer	6		0
	Total hours	**42**		**0**

4 - Teaching and Learning methods:

Intended Learning Outcomes			**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Knowledge & Understanding	a1.	Describe the crystal structure	✓		✓		✓	
	a2.	Tell about beam diffraction	✓					✓
	a3.	Recognize the relation between the nature of Incident beam and crystal dimensions	✓		✓			
	a4.	memorize the physical properties of X-Ray	✓		✓		✓	
Intellectual Skills	b1.	Compare the crystal structure of different materials	✓					
	b2.	Collect a lot of information about the nature of diffraction beams	✓		✓			✓
	b3.	Classify the types of diffraction according to the wavelength	✓		✓			
	b4.	Assess according to the computer data, what is the unit cell	✓		✓			✓
Practical and professional	c1.	Sketch the crystal structure and reciprocal cell	✓	✓			✓	
	c2.	use computer to study some crystal	✓	✓	✓		✓	
	c3.	analyze the data from X- Ray diffraction	✓	✓	✓		✓	
General Skills	d1.	How to calculate the diffraction angles according the beam energy	✓	✓			✓	✓
	d2.	Communicate to work efficiently in a team or separately	✓		✓		✓	
	d3.	Collect data and wrighting reports in the different model of atomic structure and method of diffraction	✓		✓			✓

5. Students' Assessment Methods and Grading:

Tools	To Measure	Time schedule	Grading
Semester Work	a.1, a.3, b.3, c.1, c.2, and d.1	Fifth week	5 %
Mid-Term Exam	a.2, a.3, b.1, b.2, c.1, c,3, d.2, and d.3	Seventh week	5 %
Oral exam	a.3, b.3, c.1, and d.3	Thirteenth week	10 %
Written exam	All skills	Fourteenth week	80 %
Total			100 %

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructors.

6.2. Required books.

1. Richard J. D. Tilley (2004), Understanding Solids: The Science of Materials, John Wiley & Sons Ltd
2. M. A. Omar (1975), Elementary solid-state Physics: Principal and applications, Addison. Wesley, Philippines.

6.3. Recommended books.

1. Peter Hiaasen (1986), Physics of metallurgy, Cambridge Uni. Press, PP. 1, (Experimental methods for the Physical examination of metals)
2. R.E. smallman (1985), Modern Physical metallurgy, Butterworths, PP 26

6.4. Periodicals, Web sites, etc.

1- **http://polychem.kaist.ac.kr/bk_home/2005polymerchem.htm**

7. Facilities required for teaching and learning:

Using a microphone in lectures
Using a black board
Group Discussions
Data show

Course coordinator: Dr. Hany Mohamed Hazzaa
Head of the Department: Prof. Dr. Saeed El-Sayed Abdel Ghany
Date: **2022-2023**

Course Specification
400 G: Research Essay

A. Affiliation

Relevant program:	**B.Sc. in Geology**
Department offering the program:	**Department of Geology**
Department offering the course:	**Department of Geology**
Academic year/level:	**Fourth level**

B. Basic information

Title: Research essay	**Code:400G**	**Year/level:** fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical: 0	**Total:**2 h/week

C. Professional information

1. Course Learning Objectives:

This course is aimed to widen the range of academic and transferable skills associated with geological sciences education thus equipping graduates for either subject-related or employment opportunities. It provides a broad foundation for geological study and opportunities for subsequent specialization. Students to develop their geological abilities, knowledge, and career-related life-long learning skills.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

a1. generate geological research questions and to identify and use appropriate methods in reaching and reporting conclusions,

a2. critically evaluate evidence, ideas and theoretical standpoints within a breadth of geographical and geological contexts,

a3. undertake a deeper approach to learning and understanding.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. recognize the basic theoretical, philosophical and methodological issues relating to qualitative and quantitative research,

b2. realize the concept of, and importance of, sustainability in the management of Earth and its resources,

b3. discover the constructed and dynamic nature of all knowledge.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. collect, record, analyze and present data of various forms using appropriate analytical techniques,

c2. develop a reasoned and critical argument through the integration and interpretation of analytical data and observations,

c3. accomplish timely organized research on a national or international relevant problem upon arrangement with a staff member “instructor”.

d. General skills:

On successful completion of the course, the student should be able to:

d1. communicate ideas and arguments effectively in writing, verbally, and graphically,

d2. work and communicate effectively as part of a team,

d3. demonstrate competence in the use of appropriate IT packages to find, explore, develop and present numbers, text and images.

3. Contents

Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
Topics are elected upon arrangement with the instructor in any of the geological sciences subjects or related environmental issue. Approval of the subject by the department council is necessary.	2		
Total hours	**28**	0	**0**

4 - Teaching and Learning methods:

	Intended Learning Outcomes		**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**
Knowledge & Understanding	a1.	generate geological research questions and to identify and use appropriate methods in reaching and reporting conclusions,			✓			✓
	a2.	critically evaluate evidence, ideas and theoretical standpoints within a breadth of geographical and geological contexts,	✓	✓				
	a3.	undertake a deeper approach to learning and understanding.	✓					✓
Intellectual Skills	b1.	recognize the basic theoretical, philosophical and methodological issues relating to qualitative and quantitative research,	✓				✓	
	b2.	realize the concept of, and importance of, sustainability in the management of Earth and its resources,	✓	✓				✓

	b3.	discover the constructed and dynamic nature of all knowledge.	✓	✓				✓
Practical and professional skills	c1.	collect, record, analyze and present data of various forms using appropriate analytical techniques,	✓				✓	✓
	c2.	develop a reasoned and critical argument through the integration and interpretation of analytical data and observations,	✓		✓		✓	✓
	c3.	accomplish timely organized research on a national or international relevant problem upon arrangement with a staff member "instructor".	✓				✓	
General Skills	d1.	communicate ideas and arguments effectively in writing, verbally, and graphically,	✓	✓				✓
	d2.	work and communicate effectively as part of a team,	✓	✓				✓
	d3.	demonstrate competence in the use of appropriate IT packages to find, explore, develop and present numbers, text and images.	✓	✓			✓	✓

5. Students' Assessment Methods and Grading:

5.1. Discussions

5.2. Assignments to assess the student independent work, and final written essay to evaluate the work within a team.

Tools	Grading
Semester work	20 %
Report preparation	30 %
Presentation	10 %
Discussion and Oral exam	40 %
	100 %

6. List of references:

6.1. Course notes

Materials are arranged through discussions and meetings with the instructor and from the faculty library.

6.2. Required books.

None

6.3. Recommended books

Scientific Writing

http://www.columbia.edu/cu/biology/ug/research/paper.html

6.4. Periodicals, Web sites, etc.

None

7. Facilities required for teaching and learning:

Data show and equipped hall, PCs with access to the internet

Course coordinator:	Prof. Dr. Gamal El Qot Dr. Wafaa Elshahat Afifi
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419) and updated on 2022/2023

Course Specification
405 G: Field Training

A- Affiliation

Relevant program: Geology B.Sc., Program
Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Fourth level

B - Basic information

Title: Field Geology	**Code:405 G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:**0	**Tutorial:** 0
	Practical:3	**Total:**3h/week

C - Professional information

1 – Course Learning Objectives:

The objective of this course is to introduce students to fundamentals of field geology. The students will be teached how to report geological features, data and samples. The course is designed to familiarize students with geologic mapping techniques, and to encourage the use of sedimentology and field-structural for lithology identification and stratigraphic setting.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a.1.study the field relations between various lithologies,
a.2. recognize non-tectonic- and tectonic-structures in outcrop- and regional-scales.
a.3. demonstrate successive relations between geologic structures,
a.4. analyze collected field-structural measurements,
a.5. decide which mapping technique is appropriate

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b.1. differentiate between various lithologies in the field,
b.2. use different techniques in geologic mapping,
b.3.demenostsatethe basic and progressed techniques and methods to analyze structural data,
b.4.recognizefield relations and geologic features at different scales, and
b.5. relate software and hardware in stratigraphy and paleontology.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c.1.locate himself in the field,

c.2.describe and identify different lithologies and stratigraphic setting in the field,
c.3.collect samples for paleontological studies,
c.4. report the field observations in a comprehensive trip report.

d - General skills:

On successful completion of the course, the student should be able to:

d.1. work in a team,
d.2. adhere to safty and security regulations.
d.3. collaborate with peers in a common project.
d.4.organize a short-term trip for projected geological purpose

3- Content:

Topic	Field Trip	Technical Report
1- Introduction		
2- Field equipment, rules, behavior and safety in the Field		
3- Planning for a field trip		
4- Observation study and reporting		
5- Hand specimen collection		
6- Descripting an exposure		
7- Measuring structural elements in the field		
8- Geologic - and structural- traverses		
9- Interpretations based on limited data and time		
10- Reporting measurements and observations		
11- Geologic mapping techniques		
12- Mineral deposits and their setting		
13- Filed study in hydrology		
14- Writing technical a report		
Total hours	**28**	**14**

4 - Teaching and Learning methods:

		Intended Learning Outcomes	Field Trip	Technical Report
Knowledge & Understanding	a1	study various kinds of structural fabrics	x	0
	a2	recognize field-structural relations	x	0
	a3	demonstrate structural history of an area	x	0
	a4	analyze collected field-structural measurements	x	0
	a5	decide which mapping technique is appropriate	x	0
Intellectual Skills	b1	differentiate between primary- and secondary strutures	**X**	**0**
	b2	use Brunton Compass in collecting structural data	**x**	**0**
	b3	demonstratesuccessive relations between geologic structures	**X**	**0**
	b4	Recognize and recordductile- and brittle-structures	**x**	**x**
	b5	relate software and hardware in structural synthesis	**x**	**0**
Practical and professional skills	c1	interpret geologic- and structural- maps,	x	0
	c2	analyze geological features on aerial and satellite images,	x	0
	c3	use software in plotting and analyze directional data	x	0
	c4	contribute in developing mapping techniques	**x**	**0**
General Skills	d1	collect and recordfield-structural data	x	x
	d2	transfer the projected goals to findings using collected field-structural data,construct maps, and write a technical report	0	x
	d3	Cooperate and work in a team smoothly while managing the time, and go to point and targeted goals.	x	x

5- Students' Assessment Methods and Grading:

5.1. Field behavior and activity,
5.2. Assignments to assess the student during geologic-structural traverses and collecting filed data,
5.3. Field Notebook, technical report and simplified geologic- and structural maps,
5.4. Student participation in outcrop investigation and group discussions.

Tools	To Measure	Time schedule	Grading
Field Work	a1-5, b1-5, c1-4, and d3	Field trip	60 %
Technical Report and Field Notebook	d3, d2 and d3	Field and office Work	40 %
Total			100 %

6- List of references:

6-1 Course notes

Power point presentations

6-2 Required books.

None

6-7 Recommended books

McClay, K.R. (1995) The mapping of geological structures. John Wiley & Sons, New York.

Barnes, J.W. with Lisle, R.J. (2003) Basic geological mapping (4th edition). Blackwell Science, 196p.

Gokhale, N.W (2007) Guide to field geology. Cbs Publishers & Distributors, London.

Lisle, R.J. and Leyshon, P.R. (2004) Stereographic projection techniques in structural geology (2nd edition). Cambridge University Press.

6-8 Periodicals, Web sites, etc.

http://www.geology.pitt.edu/GeoSites/field_geology.htm

http://www.field-geology.com/

http://ncgmp.usgs.gov/ncgmpgeomaps

http://ncgmp.usgs.gov/ncgmpgeomaps

http://en.wikipedia.org/wiki/Geologic_map

http://academic.emporia.edu/aberjame/field/geo_map.htm

http://www.geology.siu.edu/courses/geol454/index.html

http://ncgmp.usgs.gov/

http://csmres.jmu.edu/geollab/Fichter/Wilson/wilsonsimp.html

http://www.geo.utexas.edu/courses/660/

http://banglapedia.net/HT/F_0066.HTM

7- Facilities required for teaching and learning:

Field equipments; transportation gear, camping gear, mapping gear and outdoor gear.

Course coordinator:	Prof. Refaat Osman Prof. Gamal El Qot Prof. Emad Sallam
Head of the Department:	Prof. Gamal El Qot
Date:	Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419) updated on 2022/2023

Course Specification
407 G: Engineering Geology

A. Affiliation

Relevant program: **B.Sc. in Geology Program**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Fourth level**

B. Basic information

Title: Engineering Geology	**Code:407G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course is designed to introduce students to the major principles of physical geology covering the structure of the Earth, plate tectonics, volcanism and other mountain building processes, the surface erosion process, and the formation and properties of minerals and rocks. The relationship between application of geological knowledge to civil engineering problems such as landslide, subsidence and earthquake etc. To inspire the students to think clearly and critically the solution of the civil engineering problems in the context of geological knowledge

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

a1.Acquire the knowledge of the most important rocks and minerals
a2. Realize the relationship between rocks and engineering
a3. Identify weathering as they influence civil engineering works
a4. Review mass movement as they influence civil engineering works
a5. Demonstrate the seismic wave and earthquake.
a6. Review the Atterberg limits of soil.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1.Import, survey, classify and criticize the published Engineering Geology and industrial rock data.
b2. Apply the information, the experimental and field methods in solving site engineering and industrial rock resources management and related problems.
b3. Set-up discussions concerning the program's aims, concerning research plans, work-steps and give value to the other arguments.
b4. Organize the suitable work methods and time-plan to carry out field studies in a given site or quarry.

- b5. Arrange the appropriate tools and techniques for a given experiments both in situ or laboratory.
- b6. Assemble and integrate the collected surface and subsurface observations, results and data.
- b7. Relate each group data to their responsible sources, and then derive the best design to produce, display, interpret, manage and/or predict the engineering and industrial problems in geotechnical report.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

- c1.Design and undertake Engineering Geology and rock mechanics experimental analyses and field studies and assess their results.
- c2. Construct and carry out the Engineering Geology and rock mechanics scientific researches and applied projects and fulfill their written reports.
- c3. Evaluate and carrying out the feasibility studies of engineering projects and writing geotechnical reports.
- c4.Interpret the scientific and applied geotechnical maps, sections and documents.
- c5. Use Information Technology (IT) in the different steps of collecting, presenting and analyze the geotechnical and rock mechanics data.

d. General skills:

On successful completion of the course, the student should be able to:

- d1.Collaborate effectively and positively with others as a part of team through constructive discussions and arguments.
- d2. Undertake responsibility of doing Engineering and industrial rocks projects by himself andthe others in team works.
- d3. Formulate well scheduled working-plan and carry out its requirements both in situ and laboratory.
- d4. Use the modern software and IT in different engineering and industrial tasks, simulation and modeling.
- d5. Display the engineering and industrial information and results using the suitable equipments and / or explanatory posters, reports and models. collect data from books and other resources.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction of Engineering Geology	2		2
2- Civil Engineering and Engineering Geology	2		2
3- Earth structure, minerals, and rocks	2		2
4- Structural geology and mapping techniques	2		2
5- Physical and engineering properties of rocks	2		2
6- Geologic work of surface and subsurface water	2		2
7- Engineering concerns of rocks.	2		2
8- Formation of soils	2		2
9- Data trends, anisotropy and the uncertainty associated with geostatistical estimation	2		2
10- Different types of soils	2		2
11- Weathering mechanisms	2		2
12- Mass Movements: landslide and Factor of Safety	2		2
13- Plate Tectonics and Crust Movement	2		2
14- Engineering Classification of Soils	2		2
Total hours	**28**		**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	Acquire the knowledge of the most important rocks and minerals	✓					
	a2.	Realize the relationship between rocks and engineering	✓	✓	✓	✓		
	a3.	Identify weathering as they influence civil engineering works	✓	✓				
	a4.	Review mass movement as they influence civil engineering works	✓	✓	✓			✓
	a5.	Demonstrate the seismic wave and earthquake.				✓		
	a6.	Review the Atterberg limits of soil.			✓	✓		
Intellectual Skills	b1.	Import, survey, classify and criticize the published Engineering Geology and industrial rock data.		✓		✓		
	b2.	Apply the information, the experimental and field methods in solving site engineering and industrial rock resources management and related problems.					✓	✓

	b3.	Set-up discussions concerning the program’s aims, concerning research plans, work-steps and give value to the other arguments.				✓		
	b4.	Organize the suitable work methods and time-plan to carry out field studies in a given site or quarry.	✓					
	b5.	Arrange the appropriate tools and techniques for a given experiments both in situ or laboratory.	✓	✓	✓	✓		
	b6.	Assemble and integrate the collected surface and subsurface observations, results and data.	✓	✓				
	b7.	Relate each group data to their responsible sources, and then derive the best design to produce, display, interpret, manage and/or predict the engineering and industrial problems in geotechnical report.	✓	✓	✓			✓
Practical and professional skills	c1.	Design and undertake Engineering Geology and rock mechanics experimental analyses and field studies and assess their results.				✓		
	c2.	Construct and carry out the Engineering Geology and rock mechanics scientific researches and applied projects and fulfill their written reports.			✓	✓		
	c3.	Evaluate and carrying out the feasibility studies of engineering projects and writing geotechnical reports.		✓		✓		
	c4.	Interpret the scientific and applied geotechnical maps, sections and documents.					✓	✓
	c5.	Use Information Technology (IT) in the different steps of collecting, presenting and analyze the geotechnical and rock mechanics data.				✓		
General Skills	d1.	Collaborate effectively and positively with others as a part of team through constructive discussions and arguments.	✓					
	d2.	Undertake responsibility of doing Engineering and industrial rocks projects by himself and the others in team works.	✓	✓	✓	✓		
	d3.	Formulate well scheduled working-plan and carry out its requirements both in situ and laboratory.	✓	✓				
	d4.	Use the modern software and IT in different engineering and industrial tasks, simulation and modeling.	✓	✓	✓			✓
	d5.	Display the engineering and industrial information and results using the suitable equipments and / or explanatory posters,				✓		

		reports and models. collect data from books and other resources.						

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exams to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs b, c	Thirteenth week	24 %
Oral exam	ILOs b, c	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction of Engineering Geology	x						x						x			
Civil Engineering and Engineering Geology		x				x					x					x
Mineralogy				x												
Rock-forming minerals			x													
Rocks and their related activities				x										x		
Metamorphic rocks and metamorphism						x				x						
Engineering concerns of rocks.		x						x						x		
Formation of soils			x										x			
Data trends, anisotropy and the uncertainty associated with geostatistical estimation		x							x						x	
Different types of soils	x						x					x		x		
Weathering mechanisms			x			x							x			
Mass Movements: landslide and Factor of Safety		x								x					x	
Plate Tectonics and Crust Movement		x														x

Engineering Classification of Soils			x											x		

6. List of references:
6.1. Course notes
Lecture notes prepared by the course instructor(s)
Power point presentations

6.2. Required books.
None
6.3. Recommended books

- Legget, Robert F., and Karrow, Paul F., 1983, Handbook of geology in civil engineering: McGraw-Hill Book Company, 1,340 pages, 50 chapters, five appendices, 771 illustrations. ISBN 0-07-037061-3
- Wang H. F., Theory of Linear Poroelasticity with Applications to Geomechanics and Hydrogeology, Princeton Press, (2000).

6.4. Periodicals, Web sites, etc.
International Journal of Remote Sensing
The Egyptian Journal of Remote Sensing and Space Science
http://gdex.cr.usgs.gov/gdex/
Books and manuals on aerial photography, and the whole collection of aerial photos of Egypt available at the Geology Department.

7. Facilities required for teaching and learning:
Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions
Course coordinator: **Prof. Dr. Refaat Osman, Asst. Prof. Adel Maady**

Head of the Department: Prof. Dr. Gamal El Qot
Date: 2022/2023

Course Specification

409 G: Subsurface geology and Paleomagnetism

A- Affiliation

Relevant program: **B.Sc. in Geology**
Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Fourth level**

B - Basic information

Title: Subsurface geology and Paleomagnetism	**Code:409G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical: 2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is designed to introduce students to the study of structure and processes in the Earth, from the global scale to the shallow subsurface. It outlines key discoveries of global and lithospheric geophysics and shows how these were deduced from observed data. The course has an emphasis on the principles behind geophysical concepts, methods and data analysis. For students interested in exploration geophysics, this course provides students with a broader coverage of geophysics and a sound theoretical background, balanced by practical exercises involving experimental work, data acquisition and data analysis.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

- a1. illustrate the different terminology, principles and techniques related to subsurface geology,
- a2. recognize the significance of subsurface geology in solving different economic and environmental problems,
- a3. characterize each type of the tools and methods used in geological and paleomagnetism applications,
- a4. demonstrate how subsurface geology is important for resource exploration, land use and town planning.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

- b1. Interpret the structural and subsurface and surface geology in exploration of oil, gas, water and economic minerals and elements.,

b2. compare between the different rock types,
b3. analyze the various projection results for a 3-d body,
b4. predict and solve the geological geo-environmental problems,

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. analyze subsurface measurements and plan a project,
c2. use the subsurface tools in detecting hidden structures and ore bodies,
C3. draw interpretations of magnetic measurements and well logs.

d - General skills:

On successful completion of the course, the student should be able to:

d1. review available literature and study the area,
d2. interpret measurements using software to write a report,
d3.apply knoweldge and training in subsurface problems.
d3. work in a group and manage time and effort.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction to magnetic studies	2	0	2
2- Magnetization of deep-sea sediments.	4	0	4
3- Magnetic anomalies & seafloor spreading model.	4	0	4
4- Rates of seafloor spreading.	4	0	4
5- Dating of ocean floor.	2	0	2
6- Continental drift and paleomagnetism.	2	0	2
7- Evidence for continental drift early in the debate.	2	0	2
8- Interpretation of fossil magnetism.	4	0	4
9- Paths of polar wandering / migration of continents.	4	0	4
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes (ILOs)			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	illustrate the different terminology, principles and techniques related to subsurface geology,	√					
	a2	recognize the significance of subsurface geology in solving different economic and environmental problems,	√	√	√	√		
	a3	characterize each type of the tools and methods used in geological and paleomagnetism applications,	√	√				
	a4	demonstrate how subsurface geology is important for resource exploration, land use and town planning	√	√	√			√
Intellectual Skills	b1	interpret the structural and subsurface and surface geology in exploration of oil, gas, water and economic minerals and elements.,				√		
	b2	compare between the different rock types,			√	√		
	b3	analyze the various projection results for a 3-d body,		√		√		
	b4	predict and solve the geological geo-environmental problems,					√	√
Practical and professional skills	c1	analyze magnetic measurements and plan a project,				√		
	c2	use the subsurface tools in detecting hidden structures and ore bodies,		√	√			
	c3	draw interpretations of magnetic measurements and well logs.	√		√	√		
General Skills	d1	review available literature and study the area,	√				√	
	d2	interpret measurements using software to write a report,	√			√		
	d3	apply knoweldge and training in subsurface problems.				√		√
	d4	work in a group and manage time and effort.				√	√	√

5- Students’ Assessment Methods and Grading:

5.1. Discussion, class activates and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to magnetic studies	x						x						x			
Magnetization of deep-sea sediments.		x				x					x					x
Magnetic anomalies & seafloor spreading model.				x												
Rates of seafloor spreading.			x													
Dating of ocean floor.				x										x		
Continental drift and paleomagnetism.						x				x						
Evidence for continental drift early in the debate.		x						x						x		
Interpretation of fossil magnetism.			x										x			
Paths of polar wandering / migration of continents.		x							x						x	

6- List of references:

6-1 Course notes
Lecture notes prepared by the course instructor(s)
Power point presentations

6-2 Required books.
None
6-9 Recommended books

An Introduction to applied and environmental geophysics (Reynolds, 1997)

6-10 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:
Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinator:	Prof. Dr. Hesham Zahra Dr. Wafaa Elshahat Afifi
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification
411 G: Palynology and Fossil Imprints

A. Affiliation

Relevant program: **B.Sc. in Geology**

Department offering the program:	**Department of Geology**
Department offering the course:	**Department of Geology**
Academic year/level:	**Fourth level**

B. Basic information

Title: Palynology and Fossil Imprints	**Code:411G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2 **Practical:** 2	**Tutorial:** 0 **Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

On completion of the course, the students will be able to provide students with a set of practical skills that will allow students to date a rock sample and reconstruct the climate at the time of deposition, based on constituent palynomorphs. To meet this goal, there are three primary course objectives: 1) Explore the function and morphology of pollen and spores, using modern specimens as the primary examples. 2) Examine the organic evolution of plants, from the Cambrian colonization of the land to the Cretaceous rise of flowering plants, as recorded by fossil pollen and spores. 3) Understand the relationships between temperature, precipitation and vegetation cover.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

a1. review the classification of the plant kingdom into phyta,
a2. list the plant families according to morphological and anatomical characters,
a3. recoginze plants into families according to the composition of their fossils,
a4. demonstrate the newer aspects of taxonomy based on chemical or genetic profiles.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. separate closely related species macroscopically and microscopically,
b2. differentiate between closely related species by advanced taxonomy as serology, palynology, cytotaxonomy, and chemotaxonomy,
b3. compare and contrast the function and morphology of pollen and spores,
b4. describe and illustrate modern and fossil spores and pollen grains.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

- **c1.** make type slides from dried herbarium specimens,
- **c2.** extract palynomorphs from sedimentary rocks and mount them for study,
- **c3.** date any palynomorph-bearing sample to the correct geologic period,
- **c4.** reconstruct vegetation and paleoclimate based on palynomorph assemblages.

d. General skills:

On successful completion of the course, the student should be able to:

- **d1.** review available literature and study the area,
- **d2.** interpret measurements using software to write a report,
- **d3.** apply knoweldge and training in survey problems.
- **d4.** work in a group and manage time and effort.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction to plant taxonomy	4	0	4
2. Principles of taxonomy	4	0	4
3. History of classification systems palynology	4	0	4
4. Current systems of classification	4	0	4
5. Types of different classification keys	4	0	4
6. Relation of taxonomy to other sciences	4	0	4
7. Fossil botany	4	0	4
Total hours	**28**	0	**28**

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	review the classification of the plant kingdom into phyta,		✓		✓		
	a2.	list the plant families according to morphological and anatomical characters,					✓	✓
	a3.	recognize plants into families according to the composition of their fossils,				✓		
	a4.	demonstrate the newer aspects of taxonomy based on chemical or genetic profiles.		✓	✓			
Intellect ual Skills	b1.	separate closely related species macroscopically and microscopically,	✓		✓	✓		
	b2.	differentiate between closely related species by advanced taxonomy as	✓				✓	

		serology, palynology, cytotaxonomy, and chemotaxonomy,						
	b3.	compare and contrast the function and morphology of pollen and spores,	✓			✓		
	b4.	describe and illustrate modern and fossil spores and pollen grains.		✓		✓		
Practical and professional skills	c1.	make type slides from dried herbarium specimens,					✓	✓
	c2.	extract palynomorphs from sedimentary rocks and mount them for study,				✓		
		date any palynomorph-bearing sample to the correct geologic period,		✓	✓			
	c3.	reconstruct vegetation and paleoclimate based on palynomorph assemblages.	✓		✓	✓		
General Skills	d1.	review available literature and study the area,	✓				✓	
	d2.	interpret measurements using software to write a report,	✓			✓		
	d3.	apply knowledge and training in survey problems.		✓		✓		
	d4.	work in a group and manage time and effort.					✓	✓

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to plant taxonomy	x						x						x			
Principles of taxonomy		x				x					x					x

History of classification systems palynology				x												
Current systems of classification			x													
Types of different classification keys				x										x		
Relation of taxonomy to other sciences						x				x						
Fossil botany		x						x						x		

6. List of references:

6.1. Course notes
Lecture notes prepared by the course instructor(s)
Power point presentations

6.2. Required books.
Traverse, A., 2008. Paleopalynology, 2nd ed. Springer, Dordrecht, 813 p.
6.3. Recommended books

Esaue, k. (1976). Anatomy of Seed Plant. 2nd edition, Johan Wiley & Sons.

6.4. Periodicals, Web sites, etc.

7. Facilities required for teaching and learning:
Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinator: Prof. Gamal El Qot
Prof. Hassan El-Sheikh
Prof. Fatma Shaker

Head of the Department: Prof. Dr. Gamal El Qot
Date: Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419) 2022/2023

Course Specification
415 G: Geology of Egypt

A- Affiliation

Relevant program: B. Sc.in GeologyProgram
Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Fourth Level

B - Basic information

Title: Geology of Egypt	**Code:**415G	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C - Professional information

2 – Course Learning Objectives:

This course is dedicated to furnishing the student with the necessary basic information about the geology of Egypt in terms of sedimentary cover over the Precambrian basement and their depositional environments and related oil and ore potential.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

- a1. trace the basics, fundamentals and developments related to the geology of Egypt,
- a2. demonstrate the influence of professional practices of geological studies on the community and the environment,
- a3. follow the basics and ethics of scientific research and professional practices,
- a4. appreciate the principles and basics of quality control and its application in geological field.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

- b1. distinguish between the different types of weathering and their effects on the soil,
- b2. integrate useful solutions of soil conservation from winds.

c - Practical and professional skills:

On successful completion of the course, the student should be able to:

- c1. execute professional reports related to geology of Egypt in a responsible, safe and ethical manner for preparation of his/her research.

d - General skills:

On successful completion of the course, the student should be able to:

d1. work with peers on small projects,
d2. accomplish given scientific tasks either individually, or with a group,
d3. apply CIT, tools and scientific resources effectively in different tasks related to geology of Egypt,
d4. Communicate scientific data orally to the class audience with the help of technology aids such as a PowerPoint presentation.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- General Introduction	2	0	2
2- Precambrian rock units in Egypt.	2	0	2
3- Classification and distribution of phanerozoic rocks	2	0	2
4- Lower Paleozoic rock units of Egypt	2	0	2
5- Upper Paleozoic rock units of Egypt	2	0	2
6- Triassic rock units of Egypt	2	0	2
7- Jurassic rock units of Egypt	2	0	2
8- Lower Cretaceous rock units of Egypt	2	0	2
9- Upper Cretaceous rock units of Egypt	2	0	2
10- Paleogene rock units of Egypt	2	0	2
11- Neogene rock units of Egypt	2	0	2
12- Oil and gas possibilities in Egypt	2	0	2
13- The value and distribution of mineral deposits in Egypt	2	0	2
14- Revision and feedback	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	trace the basics, fundamentals and developments related to the geology of Egypt,	√					
	a2	demonstrate the influence of professional practices of geological studies on the community and the environment,		√	√			
	a3	follow the basics and ethics of scientific research and professional practices,	√	√	√			
	a4	appreciate the principles and basics of quality control and its application in geological field.	√				√	√
Int ell ect	b1	distinguish between the different types of weathering and their effects on the soil,			√	√		

	b2	integrate useful solutions of soil conservation from winds.	√					
Practical and professional skills	c1	execute professional reports related to geology of Egypt in a responsible, safe and ethical manner for preparation of his/her research.				√	√	√
General Skills	d1	work with peers on small projects,	√	√	√	√		
	d2	accomplish given scientific tasks either individually, or with a group,		√				
	d3	apply CIT, tools and scientific resources effectively in different tasks related to geology of Egypt,	√	√	√			
	d4	Communicate scientific data orally to the class audience with the help of technology aids such as a PowerPoint presentation.				√	√	

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate the students and promote to other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
General Introduction	x						x						x			
Precambrian rock units in Egypt.		x				x					x					x
Classification and distribution of phanerozoic rocks				x												
Lower Paleozoic rock units of Egypt			x													
Upper Paleozoic rock units of Egypt				x										x		
Triassic rock units of Egypt						x				x						
Jurassic rock units of Egypt		x						x						x		
Lower Cretaceous rock units of Egypt			x										x			
Upper Cretaceous rock units of Egypt		x							x						x	
Paleogene rock units of Egypt	x						x					x		x		
Neogene rock units of Egypt			x			x							x			
Oil and gas possibilities in Egypt		x								x					x	
The value and distribution of mineral deposits in Egypt		x														x
Revision and feedback			x											x		

6- List of references:

6-1 Course notes
Lecture notes prepared by the course instructor.
Power point presentations

6-2 Required books.
None

6-11 Recommended books

6-12 Periodicals, Web sites, etc.
http://www.nhm.ac.uk/research-curation/research/projects/duxbury/database /
http://www.ucl.ac.uk/GeolSci/micropal/welcome.html

7- Facilities required for teaching and learning:

- Data show
- Sound system to ensure the ease of listening
- Traditional chalk or pen board
- Microscopes
- Lab space equiped with the necessary devices and chemicals for sample processing

Course coordinator:	Prof. Gamal El Qot Prof. Hassan El-Sheikh Prof. Refaat Osman
Head of the Department:	Prof. Gamal El Qot
Date:	Approved on 9/12/2015 (meeting number 390) and updated on 10/1/2018 (meeting number 419) and updated on 2022/2023

Course Specification
430 G: Geotectonics and geochronology

A- Affiliation

Relevant program: **B.Sc. in Geology**
Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Fourth level**

B - Basic information

Title: Geotectonics and geochronology	**Code:430G**	**Year/level:** fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is designed to enable students to reconstruct the major tectonic events of the Earth's crust, deformation, kinematics and stability. Students to investigate the concept of plate tectonics and to deduce the role of radiogenic isotopes in identifying the age and source of crustal rocks based on their isotopic systematics.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should be able to:

a1.recognize the historical development of ideas and scientific breakthroughs associated with formulation of the Plate Tectonics theory,

a2. assess the basic physical and geochemical processes that constrain the modern models for Earth's internal structure,

a3. demonstrate the use and importance of radiogenic isotopes in studying geological and geotectonic subjects,

a4. recall the radiogenic isotope systems for age and setting of formation.

b - Intellectual skills:

Successful students should be able to.

b1. discuss the evolution of Eart's crust in view of the Plate Tectonics theory,

b2. envisage the geometry of plate margins and evolution of continents and oceans along the time,

b3.explain the basic and advanced research points related to the evolution of Plate Tectonics,

b4. investiagte the mutual relationship between radiogenic isotope geochemistry of the crustal rocks and their evolution along the Earth's history.

b5.recount the different systems of selected radiogenic isotopes, e.g., U/Pb, K/Ar, and Rb/Sr.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. reconstruct the geotectonic setting using structure and geochemical data,

c2. analyze bulk rock geochemical and radiogenic isotope data for the geotectonic settings,

c3.use the different software and apply methods to solve geological problems,

c4. interprete the isotope value data of a rock or ore deposit for the setting of a specific orogeny.

d - General skills:

On successful completion of the course, the student should be able to:

d1. review available data from publication and other resources,

d2. analyze the results in a meaningful readable final form,

d3. work in team or mosaic a piece of work with other peers.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction to Geotectonics and plate boundaries	2	0	2
2. Internal structure of the Earth	2	0	2
3. Continental drift and ocean floor spreading	2	0	2
4. Oceanic ridges and transform faults	2	0	2
5. Subduction zones, and collisional sutures	2	0	2
6. Impact of the plate tectonics	2	0	2
7. Plate tectonics and metallogenic provinces	2	0	2
8. Introduction to radiogenic isotopes of elements	2	0	2
9. Atom structure and decay	2	0	2
10. Radiometric decay	2	0	2
11. Age determination by isotopes	2	0	2
12. Geochronologcial applications	2	0	2
13. Applications and advances	2	0	2
14. Revision and evaluation session	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	recognize the historical development of ideas and scientific breakthroughs associated with formulation of the Plate Tectonics theory,	√					
	a2	assess the basic physical and geochemical processes that constrain the modern models for Earth's internal structure,	√	√		√		
	a3	demonstrate the use and importance of radiogenic isotopes in studying geological and geotectonic subjects,	√		√			√
	a4	analyze theradiogenic isotope data for age and setting of formation.		√		√		
Intellectual Skills	b1	recognize the evolution of Eart's crust in view of the Plate Tectonics theory,	√		√	√	√	
	b2	envisage the geometry of plate margins and evolution of continents and oceans along the time,		√		√	√	
	b3	explain the basic and advanced research points related to the evolution of Plate Tectonics,	√			√		
	b4	investiagte the mutual relationship between radiogenic isotope geochemistry of the crustal rocks and their evolution along the Earth's history.		√	√	√		
	b5	recount the different systems of selected radiogenic isotopes, e.g., U (Th/Hf), K/Ar, and Rb/Sr.	√			√	√	√
Practical and professional skills	c1	reconstruct the geotectonic setting using structure and geochemical data,	√		√			
	c2	analyze bulk rock geochemical and radiogenic isotope data for the geotectonic settings	√	√		√		
	c3	use the different software and apply methods to solve geological problems	√		√	√		√
	c4	interpret the isotope value data of a rock or ore deposit for the setting of a specific orogeny		√		√		
General Skills	d1	review available data from publication and other resources	√		√			√
	d2	analyze the results in a meaningful readable final form	√					

	d3	work in team or mosaic a piece of work with other peers		√		√		

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to Geotectonics and plate boundaries	x						x						x			
Internal structure of the Earth		x				x					x					x
Continental drift and ocean floor spreading				x												
Oceanic ridges and transform faults			x													
Subduction zones, and collisional sutures				x										x		
Impact of the plate tectonics						x				x						
Plate tectonics and metallogenic provinces		x						x						x		
Introduction to radiogenic isotopes of elements			x										x			
Atom structure and decay		x							x						x	
Radiometric decay	x						x					x		x		

Age determination by isotopes			x			x							x			
Geochronological applications		x								x					x	
Applications and advances		x														x
Revision and evaluation session			x											x		

6- List of references:

6-1 Course notes

Lecture notes prepared by the course instructor(s) and approved by the department council.
Course files uploaded by the instructor on the university web site.

6-2 Required books.

None

6-13 Recommended books

Plate tectonics and crustal evolution 1996, Kent C. Kondie, Printice-Hall, inc.
Microtectonics by Passchier C. W. and Trouw R. A. J. 1996.
Radiometric dating of rocks and minerals by Christopher T. Harper. Dowden, Hutchinson & Ross, 1973

6-14 Periodicals, Web sites, etc.

Geotectonics
http://www.springer.com/earth+sciences+and+geography/geology/journal/11479
http://www.platetectonics.com/book/

7- Facilities required for teaching and learning:

Power point presentations
Data show
Sound system to ensure the ease listening
PCs and software

Course coordinators: Prof. **Zakaria Hamimi**
Prof. **Rifaat Osman**

Head of the Department: Prof. Gamal El Qot
Date: 2022/2023

Course Specification

431 G: Ore microscopy and petrology

A. Affiliation

Relevant program: **B.Sc. in Geology**

Department offering the program: **Department of Geology**

Department offering the course: **Department of Geology**

Academic year/level: **Fourth level**

B. Basic information

Title: Ore microscopy and petrology	**Code:431G**	**Year/level: Fourth level**
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course is designed to introduce students to definition and classification of ore deposits. Investigation of the characteristics, genesis and distinctions of ore minerals, their optical properties and genetic associations is a prime purpose. The students are to be trained on identification of ores in the field, and the global distribution of the ore deposits and its controls and chronology.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should be able to:

a1. explain the major ore deposit types and industrial minerals and predict how these will affect exploration, evaluation and exploitation,

a2. investigate the role of ore bearing fluids in the genesis of ore deposits and identify and explain the major controls to mineralization for a variety of deposit types,

a3. recognize the mineralogical and petrological signatures of major ore deposits and industrial mineral types, identify and analyze their assemblages, textural relationships and parageneses and relate these to the mode and timing of formation,

a4. demonstrate the importance of making scientific observations, recognizing similarities between these and stated models and using these observations to determine or support complex geological interpretations.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. analyze the geologic and tectonic setting of the different ore deposits,

b2. assess mineral paragenesis and textures and reconstruct the ore genesis,

b3. apply mineral association criteria to the setting and genesis of ore textures and their evolution,
b4. investigate the distribution of ores and industrial materials in the various rock assemblages,
b5. inspect examples of the Egyptian ores.

c. Practical and professional skills:
Successful students should be professionally able to:
c1. identify the ore minerals and the associated criteria in the field and in hand specimen,
c2. acquire the basic concepts of ore petrography is given, which forms the base for an integrated study of an ore deposit,
c3. characterize each type of the ore deposits, occurrence, setting and mineralogy,
c4. detect the paragenetic and evolutionary relationships using the microscopic features.

d. General skills:
On successful completion of the course, the student should be able to:
d1. review available literature from textbooks, published maps, publications and other resources,
d2. interpret the various types of data and observations into information using software and formulate the results in a readable final form,
d3. contribute significantly to the scientific skills and attitudes of his/her peers.
d4. cooperate and work in team smoothly and manage the time while going to the targeted goals.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction to ore microscopy	2		2
2. Ore minerals	2		2
3. Classification of the ore deposits	2		2
4. Ore deposits in a global tectonic context	2		2
5. Ore-forming processes	2		2
6. Syngenetic ore deposits	2		2
7. Epigenetic ore deposits	2		2
8. Surficial and supergene ore-forming processes	2		2
9. Exploration vectors for ore deposits	2		2
10. Genetic studies of the ore deposits	2		2
11. Controls of ore deposit formation and distribution	2		2
12. Hydrothermal alteration	2		2
13. Examples from the Egyptian ore deposits	4		4
14. Revision and evaluation session	2		2
Total hours	**28**		**28**

4 - Teaching and Learning methods:

		Intended Learning Outcomes	Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	explain the major ore deposit types and industrial minerals and predict how these will affect exploration, evaluation and exploitation,	✓					
	a2.	investigate the role of ore bearing fluids in the genesis of ore deposits and identify and explain the major controls to mineralization for a variety of deposit types,	✓	✓		✓		
	a3.	recognize the mineralogical and petrological signatures of major ore deposits and industrial mineral types, identify and analyze their assemblages, textural relationships and parageneses and relate these to the mode and timing of formation,	✓		✓			✓
	a4.	demonstrate the importance of making scientific observations, recognizing similarities between these and stated models and using these observations to determine or support complex geological interpretations		✓		✓		
Intellectual Skills	b1.	analyze the geologic and tectonic setting of the different ore deposits	✓		✓	✓	✓	
	b2.	assess mineral paragenesis and textures and reconstruct the ore genesis		✓		✓	✓	
	b3.	apply mineral association criteria to the setting and genesis of ore textures and their evolution	✓			✓		
	b4.	investigate the distribution of ores and industrial materials in the various rock assemblages		✓	✓	✓		
	b5.	inspect examples of the Egyptian ores	✓			✓	✓	✓
Practical and professional skills	c1.	identify the ore minerals and the associated criteria in the field and in hand specimen	✓		✓			
	c2.	acquire the basic concepts of ore petrography is given, which forms the base for an integrated study of an ore deposit,	✓	✓		✓		
	c3.	characterize each type of the ore deposits, occurrence, setting and mineralogy,	✓		✓	✓		✓

	c4.	detect the paragenetic and evolutionary relationships using the microscopic features.		✓		✓		
General Skills	d1.	review available literature from textbooks, published maps, publications and other resources,	✓		✓			✓
	d2.	interpret the various types of data and observations into information using software for a readable final form,	✓					
	d3.	contribute significantly to the scientific skills and attitudes of his/her peers.	✓	✓		✓		
	d4.	cooperate and work in team smoothly and manage the time while going to the targeted goals.			✓			✓

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to ore microscopy	x						x						x			
Ore minerals		x				x					x					x
Classification of the ore deposits				x												
Ore deposits in a global tectonic context			x													
Ore-forming processes				x										x		
Syngenetic ore deposits						x				x						
Epigenetic ore deposits		x						x						x		

Surficial and supergene ore-forming processes			x										x			
Exploration vectors for ore deposits		x							x						x	
Genetic studies of the ore deposits	x						x					x		x		
Controls of ore deposit formation and distribution			x			x							x			
Hydrothermal alteration		x								x					x	
Examples from the Egyptian ore deposits		x														x
Revision and evaluation session			x											x		

6. List of references:

6.1. Course notes
Course notes prepared by the course instructor(s)and approved by the department council.

6.2. Required books.
None

6.3. Recommended books
Ore Microscopy and Ore Petrography Author: James R. Craig and David J. Vaughan Publisher: John Wiley and Sons (WIE); 2nd edition (May 31, 1995), 448 pages
Robb, L. (2005) Introduction to Ore-Forming Processes. Blackwell Publishing
http://www.smenet.org/opaque-ore/IX_t_0.htm

6.4. Periodicals, Web sites, etc.
Economic Geology
Ore Geology Reviews
Mineralium Deposita

7. Facilities required for teaching and learning:
Data show: Power point presentations
Sound system to ensure the ease listening
Polished and thin sections of ore deposits
Reflected-light microscopes

Course coordinator: Asst.Prof. Adel Maady
Asst.Prof. Moustafa M. Mogahed

Head of the Department: Prof. Dr. Gamal El Qot
Date: 2022/2023

Course Specification
433 G: Geochemistry

A. Affiliation

Relevant program: **B.Sc. in Geology**
Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Fourth level**

B. Basic information

Title: Geochemistry	**Code:433G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course is designed to enable students to demonstrate the chemical aspects of the earth's material and how they were generated. This accomplishment can be based on a good understanding of the basic principles of geochemical processes. Methods and techniques used in geochemical studies are important for a wide variety of applications.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the students should be able to:

a1. recognize the appropriate mathematical strategies for solving geochemical problems,
a2. recall the structure and chemistry of the rock-forming minerals and be familiar with methods for their study,
a3. relate the major chemical processes involved in water-rock reactions in the Earth's crust,
a4. report the origin of earth's crust and mantle rocks and related mineral resources,
a5. define oversimplifications in geochemical models.

b. Intellectual skills:

Successful students will be able to:

b1. review the quality of data generated by analytical geochemical techniques,
b2. present and summarise geochemical data in graphical and tabular forms, and critically appraise its significance, using appropriate statistical techniques where applicable,
b3. discuss the value and limitations of existing information on a given subject,
b4. formulate key hypotheses, using logical and consistent quantitative or qualitative arguments to characterize the investigated rocks,
b5. draw logic conclusions and identify appropriate avenues for further study.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. evaluate the principles, applications and limitations of the main analytical techniques used in geochemistry,
c2. experiment practical experience of a range of modern geochemical techniques, and advanced experience of some of these techniques,
c3. analyse the geochemical data and quality of the analytical data generated by different Techniques,
c4. reproduce data by calculation of ratios and norm values from geochemical data using specialized software.

d. General skills:

Successful students will be able to:

d1. communicate by means of well-prepared, clear and confident presentations and concise and grammatical written documents,
d2. diagnose other information sources skilfully and appropriately and to be able to cite them appropriately,
d3. conclude facts from geochemical data, such as origin and tectonic setting of rocks,
d4. organise and prioritise work activities in order to meet deadlines,
d5. work independently, with initiative, and also in teams.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction and course definition/objective	2		2
2. Structure and composition of the Earth's Interior	2		2
3. Primary geochemical differentiation of the Earth	2		2
4. Geochemical classification of elements	2		2
5. Crystal chemistry	2		2
6. Atomic substitutions	2		2
7. Geochemistry of igneous rocks	2		4
8. Geochemical environment	2		2
9. Hydrothermal alteration geochemistry	2		2
10. Geochemistry of metamorphic rocks	2		2
11. Chemical composition of meteorites.	2		2
12. Uses of stable isotope geochemistry.	2		2
13. The geochemical cycle	2		2
14. Revision and open questions	2		2
Total	**28**		**28**

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical session	Problem solving	Brain storming
Knowledge & Understanding	a1.	recognize the appropriate mathematical strategies for solving geochemical problems,	✓					
	a2.	recall the structure and chemistry of the rock-forming minerals and be familiar with methods for their study,	✓	✓		✓		
	a3.	relate the major chemical processes involved in water-rock reactions in the Earth's crust,	✓		✓			✓
	a4.	report the origin of earth's crust and mantle rocks and related mineral resources,		✓		✓		
	a5.	define oversimplifications in geochemical models.	✓		✓	✓	✓	
Intellectual Skills	b1.	review the quality of data generated by analytical geochemical techniques,		✓		✓	✓	
	b2.	present and summarise geochemical data in graphical and tabular forms, and critically appraise its significance, using appropriate statistical techniques where applicable,	✓			✓		
	b3.	discuss the value and limitations of existing information on a given subject,		✓	✓	✓		
	b4.	formulate key hypotheses, using logical and consistent quantitative or qualitative arguments to characterize the investigated rocks,	✓			✓	✓	✓
	b5.	draw logic conclusions and identify appropriate avenues for further study.	✓		✓			
Practical and professional skills	c1.	evaluate the principles, applications and limitations of the main analytical techniques used in geochemistry,	✓	✓		✓		
	c2.	experiment practical experience of a range of modern geochemical techniques, and advanced experience of some of these techniques,	✓		✓	✓		✓
	c3.	analyse the geochemical data and quality of the analytical data generated by different Techniques,		✓		✓		
	c4.	reproduce data by calculation of ratios and norm values from geochemical data using specialized software.	✓		✓			✓

General Skills	d1.	communicate by means of well-prepared, clear, and confident presentations and concise and grammatical written documents,	✓					
	d2.	diagnose other information sources skilfully and appropriately and to be able to cite them appropriately,	✓	✓		✓		
	d3.	conclude facts from geochemical data, such as origin and tectonic setting of rocks,	✓		✓			✓
	d4.	organise and prioritise work activities in order to meet deadlines,		✓		✓		
	d5.	work independently, with initiative, and also in teams			✓	✓	✓	

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course definition/objective	x						x						x			
Structure and composition of the Earth's Interior		x				x					x					x

Primary geochemical differentiation of the Earth				x												
Geochemical classification of elements			x													
Crystal chemistry				x										x		
Atomic substitutions						x				x						
Geochemistry of igneous rocks		x						x						x		
Geochemical environment			x										x			
Hydrothermal alteration geochemistry		x							x						x	
Geochemistry of metamorphic rocks	x						x					x		x		
Chemical composition of meteorites.			x			x							x			
Uses of stable isotope geochemistry.		x								x					x	
The geochemical cycle		x														x
Revision and open questions			x											x		

6. List of references:

6.1. Course notes

Course notes prepared by the course instructor(s)and approved by the department.
Course files uploaded to the instructor's home page on the university web.

6.2. Required books.

None

6.3. Recommended books

Essentials of Geochemistry Author: John Victor Walther Publisher: Jones & Bartlett Publishers; 2 edition (November 21, 2008), 700 pages.
Principles of Igneous and Metamorphic Petrology Author: Anthony Philpotts, Jay Ague. Publisher: Cambridge University Press; 2nd edition (February 2, 2009), 686 pages

6.4. Periodicals, Web sites, etc.

Geochemistry
http://www.springer.com/earth+sciences+and+geography/geology/journal/11479

7. Facilities required for teaching and learning:
Power point presentations
Data show
Sound system to ensure the ease listening
PCs and software
Electronic library

Course coordinators:	Prof. Dr. Abdelazim Mehanna Asst.Prof. Moustafa M. Mogahed
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification

434 G: Economic Geology

A. Affiliation

Relevant program: **B.Sc. in Geology**

Department offering the program: **Department of Geology**

Department offering the course: **Department of Geology**

Academic year/level: **Fourth level**

B. Basic information

Title: Economic Geology	**Code:434G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course is designed to introduce students to classification of earth resources in terms of their being biological or physical, renewable or non-renewable. The students will investigate formation, discovery, extraction and use of physical resources with respect to ores, mineral and rock resources. The overall goal is to make students familiarized with the fundamentals of mineral resources and their geological context.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of this course, the students will be able to:

- **a1.** recognizewide variety of geological environments, and emphasis their relationship with petrological and geochemical processes and geological settings,
- **a2.** recite the theory of light reflection and optical properties of ore minerals under the microscope,
- **a3.** identify each type of the ore deposits, occurrence, setting and mineralogy,
- **a4.** revealboth in theory (mathematical and physical background) and in practice (applications and training) how earth resources contribute to the industry and deveopment,
- **a5.** recognize the methods and techniques used for mineral prospection and extraction.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. identify the different ore minerals in hand specimen and under the microscope,

b2. assess mineral paragenesis and textures and reconstruct the ore genesis,

b3. analyze the setting and genesis of ore textures and their evolution,

b4. investigate the distribution of ores and industrial materials in the various rock assemblages,

b5. review the economics of ore minerals, with emphasize on the Egyptian ores.

d. practical and professional skills:

Successful students should be professionally able to:

c1. investigate ore minerals and associated criteria in the field and in hand specimen,

c2. characterize each of the mineral deposits and their geologic settings,

c3.use the reflected light microscope to identify the ore minerals and textures for genetic aspects,

C4. draw interpretations of the various geologic, mineralogical and economic issues for sake of evaluating ore deposits.

d. General skills:

On successful completion of the course, the student should be able to:

d1. review available literature from textbooks, published maps, publications and other resources,

d2. interpret the various types of data and observations into information using software and formulate the results in a readable final form,

d3. apply knoweldge and training in probem solving and new findings,

d4. cooperate and work in team smoothly and manage the time while going to the targeted goals.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction and course structure	2		2
2. Earth and earth resources	2		2
3. Mineral deposits and their geologic settings	2		2
4. Types of mineral deposits and their economics	2		2
5. Distribution of ore deposits in the globe	2		2
6. Formation models of ore deposits	2		2
7. Magma and magmatic ore deposits	2		2

8. Ore deposits in convergent tectonic setting	2		2
9. Ore deposits in divergent tectonic setting	2		2
10. Sedimentary ore deposits	2		2
11. Study of the ore deposits – geologic view	2		2
12. Tools applied to exploration for ore deposits	2		2
13. Egyptian ore deposits, distribution and genetic issues	2		2
14. Revision and evaluation/improvement plans	2		2
Total hours	**28**		**28**

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	recognize wide variety of geological environments, and emphasis their relationship with petrological and geochemical processes and geological settings,	✓					
	a2.	recite the theory of light reflection and optical properties of ore minerals under the microscope,	✓	✓		✓		
	a3.	identify each type of the ore deposits, occurrence, setting and mineralogy,	✓		✓			✓
	a4.	reveal both in theory (mathematical and physical background) and in practice (applications and training) how earth resources contribute to the industry and deveopment,		✓		✓		
	a5.	recognize the methods and techniques used for mineral prospection and extraction.	✓		✓	✓	✓	

Intellectual Skills	b1.	identify the different ore minerals in hand specimen and under the microscope,		✓		✓	✓	
	b2.	assess mineral paragenesis and textures and reconstruct the ore genesis,	✓			✓		
	b3.	analyze the setting and genesis of ore textures and their evolution,		✓	✓	✓		
	b4.	investigate the distribution of ores and industrial materials in the various rock assemblages,	✓			✓	✓	✓
	b5.	review the economics of ore minerals, with emphasize on the Egyptian ores.	✓		✓			
Practical and professional skills	c1.	investigate ore minerals and associated criteria in the field and in hand specimen,	✓	✓		✓		
	c2.	characterize each of the mineral deposits and their geologic settings,	✓		✓	✓		✓
	c3.	use the reflected light microscope to identify the ore minerals and textures for genetic aspects,		✓		✓		
	c4.	draw interpretations of the various geologic, mineralogical and economic issues for sake of evaluating ore deposits.	✓		✓			✓
General Skills	d1.	review available literature from textbooks, published maps, publications and other resources,			✓			✓
	d2.	interpret the various types of data and observations into information using software for a readable final form,		✓		✓	✓	
	d3.	apply knoweldge and training in probem solving and new findings,			✓			✓
	d4.	cooperate and work in team smoothly and manage the time while going to the targeted goals.		✓	✓			✓

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,

5.2. Assignments to assess the student independent work,

5.3. Written mid-term exam to ensure the student progress and discover the shortage,

5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	ILOs a1-3, b1-b3, c1-c2	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and course structure	x						x						x			
Earth and earth resources		x				x					x					x
Mineral deposits and their geologic settings				x												
Types of mineral deposits and their economics			x													
Distribution of ore deposits in the globe				x										x		
Formation models of ore deposits						x				x						
Magma and magmatic ore deposits		x						x						x		

Ore deposits in convergent tectonic setting			x										x			
Ore deposits in divergent tectonic setting		x							x						x	
Sedimentary ore deposits	x						x					x		x		
Study of the ore deposits – geologic view			x			x							x			
Tools applied to exploration for ore deposits		x								x					x	
Egyptian ore deposits, distribution and genetic issues		x														x
Revision and evaluation/improvement plans			x											x		

6. List of references:

6.1. Course notes

Course notes prepared by the course instructor(s) and approved by the department council.

6.2. Required books.

None

6.3. Recommended books

Walter L. Pohl., 2011. Economic Geology: Principles and Practice, ISBN: 978-1-4443-3663-4, 680 pages, Wiley-Blackwell

The principles of economic geology by Emmons, William H. (1918)
https://archive.org/details/principlesofecon00emmoiala

6.4. Periodicals, Web sites, etc.

Economic Geology

Ore Geology Reviews

Mineralium Deposita

www.segweb.org

7. Facilities required for teaching and learning:
Data show &Power point presentations
Sound system to ensure the ease listening
Equipped laboratory

Course coordinator:	Assist Prof. Abdelazim A. Rashwan Assist Prof. Adel Maady
Head of the Department:	Prof. Dr. Gamal El Qot
Approval date:	2022/2023

Course Specification

435 G: Mineral prospection and Raw materials

A. Affiliation

Relevant program: **B.Sc. in Geology Program**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Fourth level**

B. Basic information

Title: Mineral prospection and raw materials	**Code:435G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2 **Practical:**2	**Tutorial:** 0 **Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course is designed to introduce students to principles and processes of mining and exploration of earth resources. One important goal is to train students on recognition of raw materials and industrial minerals in the field and hand specimen, and to add significantly to the students 'basic and advanced knowledge on the different methods used in exploration for geological raw and industrial material, as well as relationships between resources exploitation and the environmental issues.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

- **a1.** realize the principals of mineral exploration and branches of geological and mineralogical sciences,
- **a2.** identify the different industrial materials to petrological and geochemical environment,
- **a3.**describe each of thecommonly used mining methods used for mineral extraction,
- **a4.**reciteboth in theory (mathematical and physical background) and in practice (applications and training) how to map, sample and evaluate industrial minerals or raw materials,
- **a5.** recognize the methods and techniques used for mineral prospection and extraction.

b. Intellectual skills:

Successful students in this course should be able to.

- **b1.** identify the different minerals in hand specimen and under the microscope,
- **b2.** assess mineral paragenesis and textures and reconstruct the ore genesis,
- **b3.** analyze the setting and genesis of ore textures and their evolution,
- **b4.** study the distribution of ores and industrial materials in the various rock assemblages,

b5. recognize the economics of minerals and rocks, with emphasize on the Egyptian resources.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. identify the different minerals in hand specimen and under the microscope,

c2. characterize each of the mineral assemblages and rock clans and their geologic settings,

c3. demonstrate the economic importance of minerals and rocks and how a feasibility study can be accomplished,

c4. analyze the various geologic, mineralogical and economic issues of a potential raw material or mineral deposit.

d. General skills:

On successful completion of the course, the student should be able to:

d1. assess a case study in Egypt, i.e., working mines or quarries,

d2. present results and analyze data using statistical software and formulate the results in a readable final form,

d3. apply knoweldge and training in probem solving and new findings.

d4. work smoothly in team and manage the time while going to the targeted goals.

3. Contents

Topic	Lecture hrs	Tutorial hrs	Practical hrs
1. Introduction to mineral exploration methods	2		2
2. Industrial minerals and rocks- geologic settings	2		2
3. Types of industrial minerals	2		2
4. Methods used in mineral exploration	2		2
5. Metallic and non-metallic minerals	2		2
6. Mapping and sampling	2		2
7. Feasibility studies	2		2
8. Industrial materials marketing	2		2
9. Geochemical exploration methods	2		2
10. Geophysical exploration methods	2		2
11. Statistical methods used in exploration	2		2
12. Work opportunities in mineral exploration	2		2
13. Important minerals and rocks in Egypt	2		2
14. Revision and course evaluation	2		2
Total hours	**28**		**28**

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	realize the principals of mineral exploration and branches of geological and mineralogical sciences,	✓					
	a2.	identify the different industrial materials to petrological and geochemical environment,		✓	✓			
	a3.	describe each of the commonly used mining methods used for mineral extraction,	✓	✓	✓			
	a4.	recite both in theory (mathematical and physical background) and in practice (applications and training) how to map, sample and evaluate industrial minerals or raw materials,	✓				✓	✓
	a5.	recognize the methods and techniques used for mineral prospection and extraction.			✓	✓		
Intellectual Skills	b1.	identify the different minerals in hand specimen and under the microscope,	✓					
	b2.	assess mineral paragenesis and textures and reconstruct the ore genesis,				✓	✓	✓
	b3.	analyze the setting and genesis of ore textures and their evolution,	✓	✓	✓	✓		
	b4.	study the distribution of ores and industrial materials in the various rock assemblages,		✓				
	b5.	recognize the economics of minerals and rocks, with emphasize on the Egyptian resources.	✓	✓	✓			
Practical and professional skills	c1.	identify the different minerals in hand specimen and under the microscope,				✓	✓	
	c2.	characterize each of the mineral assemblages and rock clans and their geologic settings,	✓				✓	✓
	c3.	demonstrate the economic importance of minerals and rocks and how a feasibility study can be accomplished,				✓		
	c4.	analyze the various geologic, mineralogical and economic issues of a potential raw material or mineral deposit.	✓			✓		
General Skills	d1.	assess a case study in Egypt, i.e., working mines or quarries, 0				✓	✓	
	d2.	present results and analyze data using statistical software and formulate the results in a readable final form,	✓					

	d3.	apply knoweldge and training in probem solving and new findings.		✓	✓		✓	✓
	d4.	work smoothly in team and manage the time while going to the targeted goals.	✓	✓	✓		✓	✓

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,

5.2. Assignments to assess the student independent work,

5.3. Written mid-term exam to ensure the student progress and discover the shortage,

5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	ILOs a1-3, b1-b3, c1-c2	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
		Total	100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to mineral exploration methods	x						x						x			
Industrial minerals and rocks- geologic settings		x				x					x					x
Types of industrial minerals				x												
Methods used in mineral exploration			x													
Metallic and non-metallic minerals				x										x		
Mapping and sampling						x				x						
Feasibility studies		x						x						x		
Industrial materials marketing			x										x			
Geochemical exploration methods		x							x						x	
Geophysical exploration methods	x						x					x		x		
Statistical methods used in exploration			x			x							x			
Work opportunities in mineral exploration		x								x					x	
Important minerals and rocks in Egypt		x														x
Revision and course evaluation			x											x		

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructor(s) and approved by the department council.

6.2. Required books.

None.

6.3. Recommended books

Marjoribanks, R, 1997. Geological Methods in Mineral Exploration and Mining, Chapman & Hall, London, 2nd ed. 2010, XV, 238 p.

Tatiya, R., 2005. Surface and underground excavations: methods, techniques and equipment, Taylor & Francis, ISBN 90-5809-627-0

6.4. Periodicals, Web sites, etc.

Economic Geology

Ore Geology Reviews

Journal of Geochemical Exploration

7. Facilities required for teaching and learning:
Data show
Digital movies of operating mines and tools used in exploration.
Sound system to ensure the ease listening

Course coordinator:	Assist Prof. Adel Maady Assist Prof. Moustafa M. Mogahed
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification

436 G: Introduction to Medical Geology and Volcanology

A. Affiliation

Relevant program: **B. Sc.in Geology**

Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: Fourth level

B. Basic information

Title: Introduction to Medical Geology and Volcanology	**Code:436 G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2 **Practical:**2	**Tutorial:** 0 **Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course Focus on the emerging specialty discipline of medical geology, the study of the effect of geological phenomena on animal and human health. Also targeted area applications of geochemistry to environmental health issues, geospatial analysis as a tool in epidemiology, health hazards associated with volcanic eruptions, global dust flux and respiratory problems, impacts of radon-arsenic-selenium-mercury-iodine on physiological function, carcinogenic associations with coal and fibrous minerals, geological effects on animal health, and geophagy (human ingestion of soil materials as a dietary supplement).Study of volcanic processes, eruptive products and their mechanism of formation, monitoring of active volcanoes, volcanic hazards, and the environmental impact of volcanism.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should be able to:

a1.realize the definition of risk and what factors are considered in determining the degree of risk associated with a natural hazard.

a2.recognize research a current environmental geology issue, develop an opinion based on scientific evidence, and defend that opinion in written and oral format.

a3. compose a management plan for mitigation of a given geologic hazard. recognize uses of aerial photography in geological mapping and surveying,

a4. explain how and why volcanoes erupt,

a5.describe and illustrate spatial and temporal variation in volcanic deposits and describe volcanic facies,

a6.recoginze volcanological facies to reconstruct volcanic histories.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1 explain a) the conditions conducive to the occurrence of and b) the specific hazards resulting from the geologic features and processes covered in this course, including soils, earthquakes, volcanoes, rivers and floods, landslides,

b2.assess landslide hazards based on geologic data, topographic maps, aerial photos and field observations,

b3. Construct an earthquake hazard map and conduct a flood-frequency analysis and be able to interpret flood-frequency graphs,

b4.to describe the relationship between volcanic landforms, deposits, and processes,

b5. identify, describe volcanic rocks and interpret their origin,

b6.review volcanic rocks in a plate tectonics framework.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1.construct a written environmental assessment of a specific geologic hazard, using original scientific observations,

c2. conduct an oral presentation of an original environmental assessment and management plan, using scientific evidence to defend conclusions,

c3.discuss the benefits and limitations of geological interpretations based on physical volcanology observations and experiments,

c4.discover the importance of physical volcanology to related fields such as petrology, geochemistry, geothermal exploration, hazard management, geological engineering.

d. General skills:

On successful completion of the course, the student should be able to:

d1. collect data from books and other resources,

d2. transfer the projected goals to findings using available data and software and formula the results in a easy readable final form,

d3. realize volcanic hazards, hazard mitigation and volcanic monitoring,

d4. evaluate and discuss primary literature on volcanology,

d5. work effectively and professionally in a group cooperate and work in team smoothly while managing the time, and go to point and targeted goals.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction	2		2
2. Elemental Link Between Geosphere and Biosphere	2		2
3. Essential and Non-essential Elements with Reference to Human Health	2		2
4. NORM (Naturally Occurring Radioactive Material)	2		2
5. Radon	2		2
6. Dust Storms - Health Effects	2		2

7. Hydrogeology of as	2		2
8. Volcanology – Field Relations	2		2
9. Volcanic/intrusive landforms	2		2
10. Forms of volcanoes	2		2
11. Physical Properties of Magma	2		2
12. Cooling mechanisms of flows melt density calculations	2		2
13. Predicting volcanism versus plutonism	2		2
14. Viscosity, diffusion and melt structure	2		2
Total hours	**28**		**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	realize the definition of risk and what factors are considered in determining the degree of risk associated with a natural hazard.	✓					
	a2.	recognize research a current environmental geology issue, develop an opinion based on scientific evidence, and defend that opinion in written and oral format.		✓	✓			
	a3.	compose a management plan for mitigation of a given geologic hazard. recognize uses of aerial photography in geological mapping and surveying,	✓	✓	✓			
	a4.	explain how and why volcanoes erupt,	✓				✓	✓
	a5.	describe and illustrate spatial and temporal variation in volcanic deposits and describe volcanic facies,			✓	✓		
	a6.	recoginze volcanological facies to reconstruct volcanic histories.	✓					
Intellectual Skills	b1.	Know and explain a) the conditions conducive to the occurrence of and b) the specific hazards resulting from the geologic features and processes covered in this course, including soils, earthquakes, volcanoes, rivers and floods, landslides.				✓	✓	✓
	b2.	Assess landslide hazards based on geologic data, topographic maps, aerial photos and field observations.	✓	✓	✓	✓		

	b3.	Construct an earthquake hazard map and conduct a flood-frequency analysis and be able to interpret flood-frequency graphs.		✓				
	b4.	to describe the relationship between volcanic landforms, deposits, and processes.	✓	✓	✓			
	b5.	to identify, describe volcanic rocks and interpret their origin				✓	✓	
	b6.	to understand volcanic rocks in a plate tectonics framework	✓				✓	✓
Practical and professional skills	c1.	Construct a written environmental assessment of a specific geologic hazard, using original scientific observations.				✓		
	c2.	Conduct an oral presentation of an original environmental assessment and management plan, using scientific evidence to defend conclusions.	✓			✓		
	c3.	Discuss the benefits and limitations of geological interpretations based on physical volcanology observations and experiments.				✓	✓	
	c4.	Discover the importance of physical volcanology to related fields such as petrology, geochemistry, geothermal exploration, hazard management, geological engineering.	✓					
General Skills	d1.	collect data from books and other resources,		✓	✓			
	d2.	transfer the projected goals to findings using available data and software and formula the results in a easy readable final form	✓	✓	✓			
	d3.	to understand volcanic hazards, hazard mitigation and volcanic monitoring	✓				✓	✓
	d4.	to read, evaluate and discuss primary literature on volcanology			✓	✓		
	d5.	to work effectively and professionally in a group cooperate and work in team smoothly while managing the time, and go to point and targeted goals.	✓					

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,

5.2. Assignments to assess the student independent work,

5.3. Written mid-term exam to ensure the student progress and discover the shortage,

5.4. Final written and oral exams to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction	x						x						x			
Elemental Link Between Geosphere and Biosphere		x				x					x					x
Essential and Non-essential Elements with Reference to Human Health				x												
NORM (Naturally Occurring Radioactive Material)			x													
Radon				x										x		
Dust Storms - Health Effects						x				x						
Hydrogeology of as		x						x						x		
Volcanology – Field Relations			x										x			
Volcanic/intrusive landforms		x							x						x	
forms of volcanoes	x						x					x		x		
Physical Properties of Magma			x			x							x			
cooling mechanisms of flows melt density calculations		x								x					x	
predicting volcanism versus plutonism		x														x
viscosity, diffusion and melt structure			x											x		

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructor(s)

Power point presentations

6.2. Required books.

None

6.3. Recommended books

Easton, R.M. and Johns, G.W., 1986. Volcanology and mineral exploration: The application of physical volcanology and facies studies: Wood, J., Wallace, H., eds. Volcanology and mineral deposits, Ont. Geol. Surv. Misc. Pap., v. 129, p. 2-40

6.4. Periodicals, Web sites, etc.

International Journal of volcanology

7. Facilities required for teaching and learning:

Data show

Sound system to ensure the ease listening

Using a blackboard

Group discussions

Course coordinator:	Assist Prof. Adel Maady
	Assist Prof. Moustafa M. Mogahed
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification

444 G: Well logging and structure analysis

A. Affiliation

Relevant program: **Geology B.Sc. Program**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Fourth level**

B. Basic information

Title: Well logging and structure analysis	**Code:444G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical: 2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course is designed to provide the students with a review of the theory and practice of Well-logging and structural analysis techniques. The students will be trained to assess how well logs are interpreted using software and structural analysis.

2. Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should be able to.

a1. identify the borehole geophysics and the surface geophysics.
a2. Demonstrate the objectives of well logging methods in different fields of applications.
a3. recognize the borehole environment opposite permeable and impermeable zones and the outlines on the theories, measurements, interpretations and applications of the different types of wire line logs.
a4. identify the different basement rocks of Egypt on basis of the plate tectonics concept
a5. demonstrate the detection and mapping of subsurface boundaries of normally simple geometry.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. acquire lithology from Well Logs and correlate well logs to seismic data.
b2. Use information from a variety of scientific fields for problem solving.
b3. Recognize and apply Earth Science theories and principles.
b4 hypothesize a range of principles and concepts in solving geological and geophysical problems.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. Use the recent techniques and instrumentation of well logging for solving fossil fuel resources problems.

c2. execute professional reports related to different well logging applications in a responsible, safe and ethical manner for preparation of his/her research articles and achieve experiments in well logging that achieve standard quality results using existing tools and methods.
c3 investigate corections and investigation to the area under study.
c4. use laboratory and field equipments safely for collecting and analyzing data.

d - General skills:

On successful completion of the course, the student should be able to:
d1. apply different tools and scientific resources effectively in different tasks related. to well logging
d2. detect geological structures, detect buried objects, groundwater and hydrocarbons
d3 apply logical analysis to problem solving.
d4 apply team-working and team leadership skills to addressing complex problems.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
WELL LOGGING			
1. Introduction and history of the science	2	0	2
2. Well logging procedure (Well log data acquisition and log presentation)	2	0	2
3. Borehole Environment & Recording Formats of logs	2	0	2
4. Electrical Properties of Rocks + Electrical Logs	2	0	2
5. Radioactive Properties of Rocks + Radioactive Logs	2	0	2
6. Acoustic Properties of Rocks + Acoustic Logs and Other types of wire line logs	2	0	2
7. General revision	2	0	2
STRUCTURAL ANALYSIS			
8. Introduction to structural analysis	2	0	2
9. Stereographic projection	2	0	2
10. Planer structures, linear structures and transection of planes	2	0	2
11. Representation of folds and analyzing its components	2	0	2
12. Representation of faults and analyzing its components	2	0	2
13. Field relations and observations	2	0	2
14. General revision	2	0	2
TOTAL HOURS= 28			

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	Identify the borehole geophysics and the surface geophysics	√		√	√	√	√
	a2	Demonstrate the objectives of well logging methods in different fields of applications	√	√	√	√	√	√
	a3	Recognize the borehole environment opposite permeable and impermeable zones and the outlines on the theories, measurements, interpretations and applications of the different types of wire line logs.	√		√	√		√
	a4	Identify the different basement rocks of Egypt on basis of the plate tectonics concept	√		√	√		√
	a5	Demonstrate the detection and mapping of subsurface boundaries of normally simple geometry.	√		√	√		√
Intellectual Skills	b1	Acquire lithology from Well Logs and correlate well logs to seismic data	√			√	√	
	b2	Integrate information from a variety of scientific fields for problem solving.	√			√	√	√
	b3	Recognize and apply Earth Science theories and principles.	√		√	√	√	√
	b4	Apply team-working and team leadership skills to addressing complex problems.	√	√		√		√
Practical and professional skills	c1	Use the recent techniques and instrumentation of well logging for solving fossil fuel resources problems.	√				√	√
	c2	Make professional reports related to different well logging applications in a responsible, safe and ethical manner for preparation of his/her research articles and Achieve experiments in well logging that achieve standard quality results using existing tools and methods.	√	√	√	√	√	√
	c3	Investigate corections and investigation to the area under study.	√	√		√		√

	C4	Use laboratory and field equipments safely for collecting and analyzing data.	√	√		√		√
General Skills	d1	Apply different tools and scientific resources effectively in different tasks related to well logging	√	√	√	√		√
	d2	Detect geological structures, detect buried objects, groundwater and hydrocarbons	√	√		√		√
	d3	Apply logical analysis to problem solving.	√	√		√		√
	d4	Apply team-working and team leadership skills to addressing complex problems.	√	√		√		√

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction and history of the science	x						x						x			
Well logging procedure (Well log data acquisition and log presentation)		x				x					x					x
Borehole Environment & Recording Formats of logs				x												
Electrical Properties of Rocks + Electrical Logs			x													

Radioactive Properties of Rocks + Radioactive Logs				x										x		
Acoustic Properties of Rocks + Acoustic Logs and Other types of wire line logs						x				x						
General revision		x						x						x		
Introduction to structural analysis			x										x			
Stereographic projection		x							x						x	
Planer structures, linear structures and transection of planes	x						x					x		x		
Representation of folds and analyzing its components			x			x							x			
Representation of faults and analyzing its components		x								x					x	
Field relations and observations		x														x
General revision			x											x		

6- List of references:

6-1 Course notes

Lecture notes prepared by the course instructor(s)

Power point presentations

6-2 Required books.

None

6-15 Recommended books

- Bassiouni, Z., 1994, Theory, Measurement, and Interpretation of Well Logs. SPE Textbook Series Vol. 4.
- Peters, E. J., 2012, Advanced Petrophysics. Live Oak Book Company.
- Zinszner, B. and Pellerin, F. M., 2007, A Geoscientist's Guide to Petrophysics. Editions Technip.
- Structural analysis and synthesis: S.M. Rowland, E.M. Duebendorfer and I.M. Schiefelbein.
- Park, R.G. (2005) Foundations of structural geology. Blackie & Son Limited, Chapman and Hall, New York.
- Structural geology of rocks and regions, G. Davis and S. Reynolds.
- Stereographic projection techniques in structural geology; Peter Leyshon and Richard Lisle.

6-16 Periodicals, Web sites, etc.

- Society of Petrophysicists and Well Log Analysts
http://www.spwla.org/
- Schlumberger Oil Field Glossary
http://www.glossary.oilfield.slb.com/

7- Facilities required for teaching and learning:
Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinator:	Dr. Wafaa Elshahat Afify Prof. Wael Hagag
Head of the Department:	Prof. Gamal El Qot
Date:	2022/2023

Course Specification
445 G: Photogeology and remote sensing

A- Affiliation

Relevant program: **B.Sc. in Geology**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Fourth level**

B - Basic information

Title: Photogeology and remote sensing	**Code:445G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2 **Practical:**2	**Tutorial:** 0 **Total:**4 h/week

C - Professional information

4 – Course Learning Objectives:

This course is designed to introduce students to concepts and geological applications in remote sensing with an emphasis on aerial photography. It is aimed to familiarize students with the fundamentals of both the photogeological interpretation of air-photo stereo pairs and satellite imagery through laboratory practice and available software. Studying this course will encourage the use of large-scale air-photo stereo pairs and satellite imagery in field surveying, mapping, and site investigations.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a1.review the evolution and history of photogeology and related applications,
a2. recognize uses of aerial photography in geological mapping and surveying,
a3. demonstrate the remote sensing applications, both in theory (mathematical and physical background) and in practice (applications and training),
a4. analyze the data content of remotely sensed image and how to retrieve the information,
a5. decide which remote sensing technique suites a specific problem or need.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. differentiate between different types of air-borne and space-borne images,
b2. use the available aerial photographs and remote sensing data in practical applications,
b3. demonstrate the basic and progressed techniques and methods to analyze remote sensing data,

b4. recognize the different photogeological interpretation of landscape and structural features and lithofacies from conventional aerial photographs and multiband satellite (space) imagery.
b5. relate software and hardware in aerial and space imagery.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. interpret aerial and space borne data,
c2. analyze landforms and other geological features on aerial and satellite images,
c3.use the different software and apply methods to solve geological problems,
c4. contribute to developing the available techniques, software and sensors.

d - General skills:

On successful completion of the course, the student should be able to:

d1. collect data from books and other resources,
d2. transfer the projected goals to findings using available data and software and formula the results in an easily readable final form,
d3. cooperate and work in team smoothly while managing the time and go to point and targeted goals.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction to photogeology and remote sensing	2	0	2
2. Aerial photographs, stereo- pairs and satellite images	2	0	2
3. Advances in remote sensing and photogeology	2	0	2
4. Photogeological interpretation	2	0	2
5. Stereoscopy and stereomodels	2	0	2
6. Platforms and/or sensors	2	0	2
7. Elements of image interpretations	2	0	2
8. Optical sensors and radar systems	2	0	2
9. Preprocessing and processing of remote sensing data	2	0	2
10. Panchromatic, Multispectral, thermal and hyperspectral remote sensing data	2	0	2
11. Remote sensing based geological mapping	2	0	2
12. Digital image processing and interpretation	2	0	2
13. Application and project completion	2	0	2
14. Revision and course evaluation/open session	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	review the evolution and history of photogeology and related applications,	x	x	o	x	o	o
	a2	recognize aerial photography as related to geological field mapping and surveying	x	x	o	x	x	x
	a3	demonstrate the remote sensing applications, both in theory (mathematical and physical background) and in practice (applications and training)	x	x	o	x	x	x
	a4	analyze thedata content of remotely sensed image and how to retrieve the information	x	x	o	x	o	o
	a5	decide which remote sensing technique suites a specific problem or need	x	x	x	x	o	o
Intellectual Skills	b1	differentiate between different types of air-borne and space-borne images	x	x	o	x	x	x
	b2	use the available aerial photographs and remote sensing data in practical applications	x	o	o	x	o	o
	b3	demenostsate the basic and progressed techniques and methods to analyze remote sensing data	x	x	o	x	x	o
	b4	recognize the different photogeological interpretation of landscape and structural features and lithofacies from conventional aerial photographs and multiband satellite (space) imagery.	x	x	x	x	o	o
	b5	relate software and hardware in aerial and space imagery	x	x	o	x	o	o
Practical and professional skills	c1	interpret aerial and space borne data,	o	x	x	x	x	o
	c2	analyze landforms and other geological features on aerial and satellite images,	x	x	o	x	o	o
	c3	use the different software and apply methods to solve geological problems,	x	x	o	x	x	o
	c4	contribute to developing the available techniques, software and sensors.	x	x	o	x	o	x
General Skills	d1	collect data from books and other resources,	x	x	x	x	o	o
	d2	transfer the projected goals to findings using available data and software and formula the results in an easily readable final form.	x	x	o	x	o	o

	d3	Cooperate and work in team smoothly while managing the time and go to point and targeted goals.	x	x	o	x	x	x

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exams to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	ILOs a1-3, b1-b3, c1-c2	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
		Total	100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to photogeology and remote sensing	x						x						x			
Aerial photographs, stereo- pairs and satellite images		x				x					x					x
Advances in remote sensing and photogeology				x												
Photogeological interpretation			x													
Stereoscopy and stereomodels				x										x		
Platforms and/or sensors						x				x						
Preprocessing and processing of remote sensing data		x						x						x		
Elements of image interpretations			x										x			
Optical sensors and radar systems		x							x						x	

Preprocessing and processing of remote sensing data	x						x					x		x		
Panchromatic, Multispectral, thermal and hyperspectral remote sensing data			x			x							x			
Remote sensing based geological mapping		x								x					x	
Application and project completion		x														x
Revision and course evaluation/open session			x											x		

6- List of references:

6-1 Course notes

Lecture notes prepared by the course instructor(s)
Power point presentations

6-2 Required books.

None

6-17 Recommended books

Remote Sensing and Image Interpretation (4th. edition), by Lillesand, T.M.and Kiefer, R.W., John Wiley & Sons Inc.

6-18 Periodicals, Web sites, etc.

International Journal of Remote Sensing
The Egyptian Journal of Remote Sensing and Space Science
http://gdex.cr.usgs.gov/gdex/
Books and manuals on aerial photography, and the whole collection of aerials photos of Egypt available at the Geology Department.

7- Facilities required for teaching and learning:

Data show
Sound system to ensure the ease listening
Using a white board
Group discussions

Course coordinator:	Prof. Maher El-Amawy
	Prof. Wael Hagag
Head of the Department:	Prof. Gamal El Qot
Date:	2022/2023

Course Specification
G460: Hydrogeochemistry

A- Affiliation

Relevant program: **B.Sc. inGeology**

Department offering the program:	**Department of Geology**
Department offering the course:	**Department of Geology**
Academic year/level:	**Fourth level**

B - Basic information

Title: Hydrogeochemistry	**Code:460G**	**Year/level: Fourth level**
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is aimed at introducing students to principles and processes of geochemistry of surface and groundwater, and to train students on recognition of the main concepts of water – rocks interaction, effect of pollution, good quality drinking water and tracing the origins and the history of water.

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a1. explain and master fundamental qualitative and quantitative principles of hydrogeochemistry,
a2. know how to approach and solve basic problems in the field of hydrogeochemistry,
a3. explore locations of hydrogeochemistry data and how to use them in hydrologic investigations,
a4. realize how hydrogeochemistry is interrelated with other natural and environmental science disciplines,
a5. recognize the methods and techniques used in interpetation of the hydrogeochemistry data.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. identify the ability to imagine and confirm new hypotheses, new hydrogeochemistry problem descriptions, and new hydrogeochemistry methods for analyzing data.
b2. demonstrate of the motivation to question conventional formulations of problems.
b3. examine the setting and types of waves.
b4. analyze the distribution and propagation of different types of waves.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1: acquire substantial quantities of information, process it effectively, and draw appropriate conclusions,
c2: make and record accurate observations and measurements,
c3. analyze the various geological and structural issues of hydrogeochemistry problems,
c4. carry out scientific research and evaluate and make use of the material so acquired,
c5. write and construct scientific documents using appropriate styles, conventions and terminology.

d - General skills:

On successful completion of the course, the student should be able to:

d1. work productively with others,
d2. communicate effectively in writing,
d3. organize and manage working time, schedule tasks, and meet deadlines,
d4. manage and manipulate numerical data,
d5. work safely in the laboratory and the field and to access related safety issues,

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1. Introduction	2	0	2
2. Sampling of groundwater	2	0	2
3. Field analyses and sample conservations	2	0	2
4. Accuracy of chemical analyses	2	0	2
5. Overall controls on water quality	2	0	2
6. Classification and assessment of Groundwater	4	0	4
7. Graphical presentation of analyses	6	0	6
8. Groundwater classification	6	0	6
9. Revision and Feedback	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	explain and master fundamental qualitative and quantitative principles of hydrogeochemistry,	x	0	x	0	0	x
	a2	know how to approach and solve basic problems in hydrogeochemistry,	x	x	0	0	0	0
	a3	explore locations of hydrogeochemistry data and how to use them in hydrologic investigations,	x	0	0	0	0	x

	a4	realize how hydrogeochemistry is interrelated with other natural and environmental science disciplines,	x	x	0	0	X	x
Intellectual Skills	b1	identify the ability to imagine and confirm new hypotheses, new hydrogeochemistry problem descriptions, and new hydrogeochemistry methods for analyzing data.	**x**	0	0	**0**	**X**	**0**
	b2	demonstration of the motivation to conventional formulations of problems.	**x**	0	0	**0**	**x**	**x**
	b3	analyze the setting and types of waves	x	x	0	0	0	x
	b4	study the distribution and propagation of different types of waves.	x	x	0	0	0	x
Practical and professional skills	c1	acquire substantial quantities of information, process it effectively, and draw appropriate conclusions,	x	0	0	0	X	x
	c2	make and record accurate observations and measurements,	x	0	0	0	X	x
	c3	carry out scientific research and evaluate and make use of the material so acquired,	x	x	0	0	0	x
	c4	analyze the various geological and structural issues of an hydrogeochemistry raw material or mineral deposit,	x	x	0	0	0	x
	c5	write and construct scientific documents using appropriate styles, conventions and terminology	x	0	0	0	x	x
General Skills	d1	work safely in the laboratory and the field and to access related safety issues,	x	x	0	0	0	x
	d2	organize and manage working time, schedule tasks, and meet deadlines,	x	x	0	0	0	x
	d3	undertake practical experimental work using appropriate equipment and instruments,	x	x	0	0	0	x
	d4	work safely in the laboratory and the field and to access related safety issues,	x	x	0	0	0	x
	d5	undertake practical experimental work using appropriate equipment and instruments.	x	x	0	0	0	x

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction	x						x						x			
Sampling of groundwater		x				x					x					x
Field analyses and sample conservations				x												
Accuracy of chemical analyses			x													
Overall controls on water quality				x										x		
Classification and assessment of Groundwater						x				x						
Graphical presentation of analyses		x						x						x		
Groundwater classification			x										x			
Revision and Feedback		x							x						x	

6- List of references:

6-1 Course notes

Lecture notes prepared by the course instructor(s)and approved by the Department council.

6-2 Required books.

None

6-19 Recommended books

Geochemistry, groundwater and pollution (eBook, 2005) Get this from a library!
Geochemistry, **groundwater and pollution**. [C A J Appelo; Dieke Postma]
Physical and Chemical hydrogeology by Domenico, P.A. and Schwartz, F.W., (1990): “(eds)” Wiley, J. and Sons, inc. New York
Groundwater resource development Hamill, L. and Bell, F.G.,(1986): British Library, ISBN 0-408-01409-1, pages. 253
Groundwater Geochemistry a Practical Guide to Modeling of Natural and Contaminated quatic Systems by Broder J. Merkel Britta Planer-Friedrich Edited by Darrell Kirk Nordstrom ISBN 3-540-24195-7 Springer Berlin Heidelberg New York Library of Congress Control Number: 2004117858

6-4 Periodicals, Web sites, etc.

www.google.com &www.scincedirect.com&*www.worldcat.org/*

7- Facilities required for teaching and learning:

Data show: Power point presentations
Sound system to ensure the ease listening
Using a blackboard

Course coordinator:	Prof. Dr. Mohamed El-Fakharany / Dr. Nehad Mahmoud
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification

461 G: Petroleum Geology

A. Affiliation

Relevant program: **B.Sc. inGeology**

Department offering the program:	**Department of Geology**
Department offering the course:	**Department of Geology**
Academic year/level:	**Fourth level**

B. Basic information

Title: Petroleum Geology	**Code:461G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical:2	**Total:**4 h/week

C. Professional information

1. Course Learning Objectives:

This course aims to develop advanced skills and competency in specialist petroleum geoscience disciplines, notably geology (e.g., basin analysis, sequence stratigraphy, tectonics, reservoir geology) and geophysics (e.g., seismic data acquisition/processing, 2D/3D seismic interpretation). It will encourage students to apply these skills to the full spectrum of hydrocarbon exploration and production activities (play fairway analysis, prospect evaluation, development and reservoir management) through classroom study, field work, integrated team projects and independent research and investigation.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should:

a1. explain and master fundamental qualitative and quantitative principles of petroleum geology,

a2.know how to approach and solve basic problems in the field of petroleum geology,

a3.explore locations of petroleum geology data and how to use them in case investigations,

a4.realize how petroleum geology is interrelated with other natural and environmental science disciplines,

a5. recognize the methods and techniques used in interpetation of the petroleum geology data.

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. identify the ability to imagine and confirm new hypotheses, new petroleum geology problem descriptions, and new petroleum geology methods for analyzing data.

b2. demonstration of the motivation to question conventional formulations of problems.

b3. analyze the setting and types of waves.

b4. study the distribution and propagation of different types of waves.

c. Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

- **c1.** acquire substantial quantities of information, process it effectively, and draw appropriate conclusions,
- **c2.** make and record accurate observations and measurements,
- **c3.** analyze the various geological and structural issues of petroleum geology problems,
- **c4.** carry out scientific research and evaluate and make use of the material so acquired,
- **c5.** write and construct scientific documents using appropriate styles, conventions and terminology.

d. General skills:

On successful completion of the course, the student should be able to:

- **d1.** work productively with others,
- **d2.** communicate effectively in writing,
- **d3.** organize and manage working time, schedule tasks, and meet deadlines,
- **d4.** manage and manipulate numerical data,
- **d5.** work safely in the laboratory and the field and to access related safety issues,

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1.Introduction: what is petroleum? Geologic factors	2		2
2.Porosity and permeability in sedimentary rocks	2		2
3.Burial Histories; Burial and diagenesis	2		2
4.Student–led discussions of case studies.	2		2
5.Paleohydrology in sedimentary basins	2		2
6.Reservoirs and traps	2		2
7.Source Rocks; organic geochemistry of oil and gas	2		2
8.Diagenesis, catagenesis, and thermal markers	2		2
9.Basin Analysis I: basin formation and types	2		2
10. Sequence stratigraphy and basin analysis	2		2
11. Drilling and geophysical logging methods	2		2
12. Student presentations.	2		2
13. Basin analysis II: primary and secondary migration	2		2
14. Wrap-up and review	2		2
Total hours	**28**		**28**

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	explain and master fundamental qualitative and quantitative principles of petroleum geology,	✓					
	a2.	know how to approach and solve basic problems in the field of petroleum geology,		✓	✓			
	a3.	explore locations of petroleum geology data and how to use them in hydrologic investigations,	✓	✓	✓			
	a4.	realize how petroleum geology is interrelated with other natural and environmental science disciplines,	✓				✓	✓
Intellectual Skills	b1.	identify the ability to imagine and confirm new hypotheses, new petroleum geology problem descriptions, and new petroleum geology methods for analyzing data.			✓	✓		
	b2.	demonstration of the motivation to question conventional formulations of problems.	✓					
	b3.	analyze the setting and types of waves				✓	✓	✓
	b4.	study the distribution and propagation of different types of waves.	✓	✓	✓	✓		
Practical and professional skills	c1.	acquire substantial quantities of information, process it effectively, and draw appropriate conclusions,		✓				
	c2.	make and record accurate observations and measurements,	✓	✓	✓			
	c3.	carry out scientific research and evaluate and make use of the material so acquired,				✓	✓	
	c4.	analyze the various geological and structural issues of a petroleum geology raw material or mineral deposit,	✓				✓	✓
	c5.	write and construct scientific documents using appropriate styles, conventions and terminology				✓		
General Skills	d1.	work safely in the laboratory and the field and to access related safety issues,	✓			✓		
	d2.	organize and manage working time, schedule tasks, and meet deadlines,				✓	✓	
	d3.	undertake practical experimental work using appropriate equipment and instruments,	✓					

	d4.	work safely in the laboratory and the field and to access related safety issues,		✓	✓				
	d5.	undertake practical experimental work using appropriate equipment and instruments.	✓	✓	✓				

5. Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction: what is petroleum? Geologic factors	x						x						x			
Porosity and permeability in sedimentary rocks		x				x					x					x
Burial Histories; Burial and diagenesis				x												
Student–led discussions of case studies.			x													
Paleohydrology in sedimentary basins				x										x		
Reservoirs and traps						x				x						
Source Rocks; organic geochemistry of oil and gas		x						x						x		
Diagenesis, catagenesis, and thermal markers			x										x			
Basin Analysis I: basin formation and types		x							x						x	
Sequence stratigraphy and basin analysis	x						x					x		x		
Drilling and geophysical logging methods			x			x							x			
Student presentations.		x								x					x	
Basin analysis II: primary and secondary migration		x														x
Wrap-up and review			x											x		

6. List of references:

6.1. Course notes

Lecture notes prepared by the course instructor(s)
Power point presentations
Notes of Petroleum geology for students.

6.2. Required books.

None

6.3. Recommended books

None

6.4. Periodicals, Web sites, etc.

www.google.com & www.scincedirect.com

7. Facilities required for teaching and learning:

Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinator:	Dr. Mohamed Afife
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification

462 G: Hydrogeology of Egypt

A- Affiliation

Relevant program: **B.Sc. in Geology**

Department offering the program: **Department of Geology**
Department offering the course: **Department of Geology**
Academic year/level: **Fourth level**

B - Basic information

Title: Hydrogeology of Egypt	**Code:462G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical: 2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is designed to study the distribution of groundwater aquifers in different provinces in Egypt. The students should therefore be able to assess the hydrogeological and hydrochemical characteristics of groundwater aquifers

2 - Intended Learning Outcomes (ILOS)

On successful completion of the course, the graduate will be able to:

a.1. Gain knowledge and systematic understanding of hydrogeological units in some localities of Egypt

a.2. Gain a critical awareness of hydrocgeological and hydrogeochemical characters of the concerned hydrogeological units

a.3. An understanding of the theoretical basis for groundwater Classification in some localities

a.4. Realize the hydrogelogic value for the hydrocgeological and hydrogeochemical characters

b - Intellectual skills:

On successful completion of the course, the graduate will be able to:

b1. explain the basic principles of Hydrogeology of certain area;
b2. identify and classify the groundwater aquifers and;
b3. identify and classify different hydrogeological units
b4. explain the basic processes for studing defferent water units
b5. know and understand the hydrogeochemical characters of certain area

c - Practical and professional skills:

On successful completion of the course, the graduate will be able to:

c1. identify and interpret aquifer geochemistryof certain area
c2. understand different hydrogeochemical parameterssof certain area ;
c3. understand the key factors that govern aquifers geochemistry of certain area;
c4. interrogate and interpret the geological literature on aquifers geochemistry
c5. write clear and concise hydrogeological reports of an area.

d - General skills:

On successful completion of the course, the graduate will be able to:

d1. Collaborate effectively and positively with others as a part of team through constructive discussions and arguments.

d2. Undertake responsibility of doing hydrogeological projects by himself and the other in team works.

d3. Display the hydrogeological and hydrogeochemical information and results, using the suitable equipment and / or explanatory posters, reports and models.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- Introduction to the hydrogeology of Egypt	2	0	2
2- Groundwater aquifers in the Nile Delta basin	2	0	4
3- Groundwater aquifers in the Eastern Desert	6	0	4
4- Groundwater aquifers in Sinai	4	0	4
5- Groundwater aquifers in the Western Desert	8	0	4
6- Groundwater aquifers in the Nile Vally	4	0	4
7- Revision and Feedback	2	0	2
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	Gain knowledge and systematic understanding of hydrogeological units in some localities of Egypt	x	0	x	0	0	x
	a2	Gain a critical awareness of hydrocgeological and hydrogeochemical characters of the concerned hydrogeological units	x	x	0	0	0	0
	a3	An understanding of the theoretical basis for groundwater Classification in some localities	x	0	0	0	0	x
	a4	Realize the hydrogelogic value for the hydrocgeological and hydrogeochemical characters	x	x	0	0	X	x

intellectual Skills	b1	explain the basic principles of Hydrogeology of certain area;	x	0	0	0	X	x
	b2	identify and classify the groundwater aquifers;	x	0	0	0	X	x
	b3	identify and classify different hydrogeological units	x	x	0	0	0	x
	b4	explain the basic processes for studying different water units	x	x	0	0	0	x
	b5	know and understand the hydrogeochemical characters of certain area						
Practical and professional skills	c1	identify and interpret aquifer geochemistry of certain area	x	0	0	0	X	x
	c2	understand different hydrogeochemical parameters of certain area	x	0	0	0	X	x
	c3	understand the key factors that govern aquifers geochemistry of certain area	x	x	0	0	0	x
	c4	interrogate and interpret the geological literature on aquifers geochemistry	x	x	0	0	0	x
	c5	c5. write clear and concise hydrogeological reports of an area.	x	0	0	0	x	x
General Skills	d1	Collaborate effectively and positively with others as a part of team through constructive discussions and arguments.	x	x	0	0	0	x
	d2	Undertake responsibility of doing hydrogeological projects by himself and the other in team works.	x	x	0	0	0	x
	d3	Display the hydrogeological and hydrogeochemical information and results, using the suitable equipment and / or explanatory posters, reports and models.	x	x	0	0	0	x

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	To Measure	Time schedule	Grading
Semester Work	a1, a2, a3, and b2	Fifth week	6 %
Mid-Term Exam	a1, a5, b3, b4.	Seventh week	6 %
Oral exam	a2, a3, a4, a5, b5, b1, c2, c3	Thirteenth week	16 %
Final written exam	a1, a2, a3, a5, b1, b2, b4, b5, c1, c2, c3, d2.	Fourteenth week	72 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Introduction to the hydrogeology of Egypt	x						x						x			
Groundwater aquifers in the Nile Delta basin		x				x					x					x
Groundwater aquifers in the Eastern Desert				x												
Groundwater aquifers in Sinai			x													
Groundwater aquifers in the Western Desert				x										x		
Groundwater aquifers in the Nile Vally						x				x						
Revision and Feedback		x						x						x		

6- List of references:

6-1 Course notes
Lecture notes prepared by the course instructor(s)

6-2 Required books.
None
6-20 Recommended books
Strategies for planning and Management of groundwater in the Nile valley and Delta in **Egypt** by HEFNY, K AND SHATA, A 1995: Pap. No. 31.

Hydrogeological map of Egypt, Scale 1:100,000 1st edition, Kom Ombo, QENA, Gerga, Sohag, Tanta, Assuit, El-Minya, Beni Suef and Cairo sheets by RESEARCH INSTITUTE FOR GROUNDWATER (RIGW), 1989

Hydrogeological map of Egypt, Scale 1:500,000 1st editions, Nile Delta. By RESEARCH INSTITUTE FOR GROUNDWATER (RIGW), 1992:

WATER RESOURCES AND HYDROMETEOROLOGY Of THE ARAB REGION by MAMDOUH SHAHIN *Water Resources Engineering Consultant Formerly Professor Cairo University, Giza, Egypt and IHE-Delft, The Netherlands* Published by Springer, P.O. Box 17, 3300 AA Dordrecht, The Netherlands.

6-21 Periodicals, Web sites, etc.
www.springer.com

7- Facilities required for teaching and learning:

Data show
Sound system to ensure the ease listening
Using a blackboard
Group discussions

Course coordinator:	Prof. Dr. Mohamed El-Fakharany / Dr. Nehad Mahmoud
Head of the Department:	Prof. Dr. Gamal El Qot
Date:	2022/2023

Course Specification

463 G: Environmental geology and water pollution

A- Affiliation

Relevant program: **B.Sc. in Geology**

Department offering the program:	**Department of Geology**
Department offering the course:	**Department of Geology**
Academic year/level:	**Fourth level**

B - Basic information

Title: Environmental geology and water pollution	**Code:463G**	**Year/level:** Fourth level
Teaching Hours:	**Lectures:** 2	**Tutorial:** 0
	Practical: 2	**Total:**4 h/week

C - Professional information

1 – Course Learning Objectives:

This course is designed to provide a basic understanding of geologic processes and how they inter-relate with human activities. It is also aimed to examine how human activities impact natural geologic systems

2 - Intended Learning Outcomes (ILOS)

a - Knowledge and understanding:

On successful completion of the course, the student should:

a1. review the role of environmental geology subject and pollution studies,
a2. recognize the pollution problems and ways to solve,
a3. characterize each type of the tools and methods used in geological and environmental survey applications,
a4. demonstrate how survey is important for land use and town planning and environmental geological aspects.

b - Intellectual skills:

On successful completion of the course, the student should be able to.

b1. organize the project and set up a treatment and precautionary plan,
b2. decide which treatment method and tool can be used,
b3. analyze the various environmental geology aspects,
b4. investigate the distribution of risk and environmental issue problems.

c - Practical and professional skills:

On successful completion of the course, the student should be professionally able to:

c1. analyze pollution measurements and plan a project,
c2. use the detection tools in mapping environmental problems,
c3. Draw interpretations of pollution measurements and side effects.

d - General skills:

On successful completion of the course, the student should be able to:

d1. review available literature and study the area,
d2. interpret measurements using software to write a report,
d3. apply knoweldge and training in environmental problems.
d3. work in a group and manage time and effort.

3 – Contents

Topic	Lecture hours	Tutorial hours	Practical hours
1- The causes and sources of pollution	2	0	2
2- Pollutants and their movement in surface and ground water	4	0	4
3- The impact of seawater intrusion on groundwater quality	4	0	4
4- The rise of water level and its impact on the environment	4	0	4
5- Flashfloods and its hazards	4	0	4
6- The movements of sand dunes and its hazards	4	0	4
7- Global climate changes	2	0	2
8- Revision and feedback	4	0	4
Total hours	**28**	0	**28**

4 - Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1	review the role of environmental geology subject and pollution studies,	√					
	a2	recognize the pollution problems and ways to solve,		√	√			
	a3	characterize each type of the tools and methods used in geological and environmental survey applications,	√	√	√			
	a4	demonstrate how survey is important for land use and town planning and environmental geological aspects.	√				√	√
Intellectual Skills	b1	organize the project and set up a treatment and precautionary plan,			√	√		
	b2	decide which treatment method and tool can be used,	√					
	b3	analyze the various environmental geology aspects,				√	√	√

	b4	investigate the distribution of risk and environmental issue problems.	√	√	√	√		
Practical and professional skills	c1	analyze pollution measurements and plan a project,		√				
	c2	use the detection tools in mapping environmental problems,	√	√	√			
	c3	draw interpretations of pollution measurements and side effects.				√	√	
General Skills	d1	review available literature and study the area,	√				√	√
	d2	interpret measurements using software to write a report,				√		
	d3	apply knoweldge and training in environmental problems,	√			√		
	d4	work in a group and manage time and effort.				√	√	

5- Students' Assessment Methods and Grading:

5.1. Discussion, class activities and quizzes to assess the student progress and personal attitude,
5.2. Assignments to assess the student independent work,
5.3. Written mid-term exam to ensure the student progress and discover the shortage,
5.4. Final written and oral exam to evaluate students and promote for other consequent courses.

Tools	**To Measure**	**Time schedule**	**Grading**
Semester work	ILOs a, b, d	Semester course	8 %
Mid-Term exam	First ½ of ILOs a, b, c	Seventh week	6 %
Practical exam	ILOs c, b	Thirteenth week	24 %
Oral exam	ILOs c, b	Thirteenth week	14 %
Final written exam	ILOs a, b, c	Fourteenth week	48 %
Total			100 %

-Course matrix

contents	Knowledge and understanding				Intellectual skills				Practical and professional skills				General skills			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
The causes and sources of pollution	x						x						x			
Pollutants and their movement in surface and ground water		x				x					x					x
The impact of seawater intrusion on groundwater quality				x												

The rise of water level and its impact on the environment			x													
Flashfloods and its hazards				x										x		
The movements of sand dunes and its hazards						x				x						
Global climate changes		x						x						x		
Revision and feedback			x										x			

6- List of references:

6-1 Course notes
Lecture notes prepared by the course instructor(s)

6-2 Required books.
None

6-22 Recommended books
INTRODUCTION TO ENVIRONMENTAL HYDROGEOCHEMISTRY by© Ondřej Šráček, Josef Zeman, 2004 ISBN 80-210-3586-2
Climatic Changes and Water Resources in the Middle East and North Africa by F. Zereini · H. Hötzl (Eds.) ISBN: 978-3-540-85046-5 e-ISBN: 978-3-540-85047-2 Environmental Science and Engineering ISSN: 1863-5520 Library of Congress Control Number: 2008932570 _c 2008 Springer-Verlag Berlin Heidelberg
Geochemistry, **groundwater and pollution**. [C A J Appelo; Dieke Postma]
Groundwater resource development Hamill, L. and Bell, F.G.,(1986): British Library, ISBN 0-408-01409-1, pages. 253

6-23 Periodicals, Web sites, etc.

7- Facilities required for teaching and learning:
Data show
Sound system to ensure the ease of listening
Using a blackboard
Group discussions

Course coordinator: Prof. Dr. Mohamed El-Fakharany
Head of the Department: Prof. Dr. Gamal El Qot
Date: 2022/2023

اقتراحات اللجنه المشكله من القسم لتوصيف ووضع معايير
لتقييم مقرر التدريبات الحقليه

1- يتم تدريس مقرر االجيولوجيا الحقلية على مدار العام الدراسى و يشارك فيه كل شعب القسم ويقوم الأستاذ الدكتور / زكريا هميمى بإعداد مسوده تشمل الإطار العام للموضوعات التى سوف يتم تدريسها ويتم مناقشتها فى مجلس القسم ثم تتولى كل شعبه إعداد الجزء الخاص بها من ذلك المقرر.

2- يتم أدراج المقرر ضمن الساعات التدريسيه الفعليه لأعضاء هيئه التدريس بواقع 3 ساعات عمليه فى الأسبوع لكل عضو

3- يفضل قيام الرحلتين العلميتين للطلاب الى الحقل بين الفصلين الدراسيين

4- يفضل ان امكن اختيار بعض المناطق القريبة مثل أبورواش او طريق السخنة تحت اشراف أعضاء هيئه التدريس للقيام برحلات اليوم الواحد ويكون لها نسبه يتفق عليها داخل مجلس القسم ولا تتجاوز 10% من الدرجه الكليه المخصصه للماده.

5- يتم تقييم الطلاب كالتالى :- (50 درجه للرحله العلميه)+ 50 درجه للأمتحان

10 درجات لانتظام الطالب و اهتمامه و متابعته أثناء العمل الحقلى

10 درجات كراسة الحقل (Field Notebook)

20 درجة تقرير(Report) على ان يقدم كل طالب تقرير خاص به

10 درجات امتحان عملى فى الحقل

50 درجة final exam (20 درجة شفهى – 30 درجة نظرى)

يشتمل الأمتحان على مقرر الجيولوجيا الحقليه الذى تم تدريسه للطلاب وكذلك على المعلومات التى درسها الطالب فى الرحله العلميه و الإمتحان ينقسم الى جزئين شفهى يقيم فيه الطالب بواقع 20 درجه وامتحان نظرى يقيم فيه الطالب من 30 درجه.

6- يتم عقد الأمتحان قبل بدايه الأمتحانات النظريه كورقه إمتحان عمليه

اقتراحات اللجنه المشكله من القسم لتوصيف ووضع معاير
لتقييم مقرر البحث والمقال

مادة البحث والمقال هو عمل مستقل يقوم به كل طالب ويتولى إنجازه وفق جدول زمني محدد يقوم الطالب خلاله بإعداد بحث/مشروع في موضوع من موضوعات فروع التخصص الرئيسية التي يتولى دراستها في شعبته، وتحت إشراف أحد أساتذتها، ويتم تقديمه بشكله النهائي مطبوعاً، وتتم مناقشته من قبل لجنة مشكلة من مجلس القسم ويكون الأستاذ المشرف عضوا فيها. ويساهم الطالب بشكل كبير في تحديد مضمون مشروعه، حيث يعطى مساحة واسعة من الحرية سواء في اختيار الفرع الذي سيتولى التركيز عليه، وذلك من خلال تحديده واختيار عنوانه أو من خلال مضمونه بمساعدة الأستاذ المشرف، حيث يتولى الطالب جمع المعلومات بنفسه، وبذلك يختلف هذا المقرر عن بقية المقررات في الحرية الواسعة التي يملكها الطالب، والتي تهدف إلى تنمية قدراته الفكرية والعلمية. ومن ناحية أخرى فإن إنجاز المشروع يتطلب قدراً أكبر من الاستقلالية التي تمنحها للطالب القدرة الذاتية على البحث والتحري وجمع المعلومات من المراجع الأصيلة المختلفة، تلك المهارة التي يتطلبها الاستقلال في البحث عن المعلومة وجمعها إلى جانب المهارات التنظيمية التي يتطلبها عرض الأفكار وتسلسلها ومنطقيتها. كما أن لهذا المشروع الأثر الكبير على شخصية منفذه الذي يكتسب من خلاله الثقة بالنفس والاعتماد على الذات في الوصول إلى المعلومة مع تعزيز القدرة على البحث العلمي ومنحه المجال لإظهار إمكاناته العقلية والفكرية وإعطائه الفرصة للتعبير عن ذاته وإبداء آرائه ويتيح المشروع أيضاً للطالب أن يظهر من خلال التطبيق العلمي الذي يجسده في البحث مدى المعرفة النظرية المكتسبة التي تمثل الحصيلة المعرفية للمقررات التي تلقاها في التخصصات الأساسية على مدى دراسته

أهداف المشروع

بعد إكمال الطالب المشروع يكون من المفترض أنه قد اكتسب المهارات الضرورية الآتية: -

- **أن يكون بمقدوره العمل باستقلالية.**
- **أن يكون قادراً على أن يُحضّر ويقدم عمله بمعايير مهنية ملائمة.**
- **أن يكون بمقدوره التواصل بمهارة مع جمهور المختصين.**
- **أن يكون قادراً من خلاله على تنمية قدراته الفكرية والعلمية والبحثية**

طرق التعليم والتعلم

- **يتم إنجاز البحث من قبل الطالب لذلك فإن عليه أن يكون على جاهزية وجهد كبيرين يتناسبان مع ما تتطلبه الساعات المعتمدة للمشروع.**
- **يتم إنجاز المشروع من قبل الطالب تحت توجيه أحد أساتذة القسم في التخصص وتحت إشرافه، وذلك من خلال اللقاءات الدورية والمنتظمة والمعلن عنها في جدوله.**
- **يتولى المشرف تزويد الطالب بالنصائح والإرشادات العلمية وكذلك بعض المراجع العلمية ان لزم الامر والتي تجنبه الوقوع في الأخطاء سواء المتعلقة منها في المنهج أو في الموضوع أو في الاستنتاج ومراجعة النتائج اول بأول.**

الشكل النهائي للمشروع

أولاً:إن الشكل النهائي لتقرير المشروع يفترض: -

- أن يكون التقرير مطبوعا (يرفق معه البرنامج المصمم في أسطوانة CD).
- ألا تتجاوز عدد صفحاته المائه صفحة والا تقل عن عشرون صفحه.
- أن يكون مجلداً تجليداً عادياً وبسيطاً مع مراعاة التنظيم.
- أن تتضمن الصفحة الأولى منه اسم الجامعة وشعارها واسم الكلية وعنوان المشروع واسم الطالب ورقمه الجامعي واسم الأستاذ المشرف والسنة الجامعية مرتبة حسب التسلسل.
- أن يقدم المشروع بصيغته النهائية للقسم بعدد نسخ من المشروع بواقع عدد المحكمين + نسخه تحفظ فى القسم قبل موعد المناقشه باسبوع على الاقل

ثانياً: متطلبات إخراج المشروع بشكله النهائي: -

- ترتب جميع عناوين المشروع الأساسية من فصول ومباحث وفروع في وسط الصفحة بخط أسود ثقيل.
- تكتب العناوين بخط عريض حجم 16.
- تنسق صفحات البحث بحيث تترك مسافة 2 سم من أعلى وأسفل ويسار الصفحة وتترك مسافة 3 سم من يمين الصفحة.
- تترك مسافتان بين سطر وآخر.
- تكتب الهوامش بخط حجم 12.
- يتبع بشأن الإشارة إلى المراجع ما هو متعارف عليه في التوثيق العلمي للأبحاث والرسائل العلمية.

ثالثاً: يتكون تقرير المشروع من المكونات الآتية: -

- صفحة العنوان.
- الملخص.
- فهرست المحتويات.
- المقدمة.
- المحتوى
- الخاتمة.
- قائمة بالمراجع مرتبة حسب الأحرف الأبجدية للمؤلفين.

ملخص تقرير المشروع ينبغي ان لا يتجاوز 200 كلمة (ملخص باللغة العربية + ملخص باللغة الإنجليزية) يتضمن ما يأتي: -

- أهداف المشروع.
- الأسلوب الذي اعتمده الباحث.
- النتائج والتوصيات التي توصل إليها الباحث.

طريقة عرض المشروع وتقييمه

يتم تقييم المشروع وفق الخطوات الآتية: -

- **يخضع المشروع للتقييم من لجنة موحده مشكلة من قبل مجلس القسم تحتوي الأستاذ المشرف على هذا البحث/المشروع.**
- **يكون المشروع قابلاً للتقييم من تاريخ تسليم التقرير للقسم مطبوعاً بصيغته النهائية مرفق معه أسطوانة تحتوي على مرفقات المشروع.**
- **تتم مناقشة الطالب مناقشة علنية يعلن عنها مسبقا ويمكن لأي أستاذ او طالب حضورها.**
- **يعرض الطالب المشروع عن طريق الإلقاء المدعم بالتقنيات الحديثة والمتاحة في الكلية.**

ضوابط المشروع

1- يتم طرح مادة المقال و البحث من بداية الفصل الدراسى الاول و يتم تنفيذ البحث على مدار العام الدراسى و ذلك لطلاب المستوى الرابع
2- يتم توزيع الطلاب على الاساتذة بطريقة عشوائية للطلاب فى وجود جميع أعضاء مجلس القسم أو عن طريق عمل قرعه علنيه فى وجود جميع الطلاب المسجلين للمقرر وبإشراف لجنه يختارها مجلس القسم

3- يتم تقييم المشروع من خلال مناقشة الطالب مناقشة علنية تهدف إلى إبراز القيمة الموضوعية للمشروع وزرع الثقة بنفسه وتدريبه على التحدث ومن أهم المقاييس التي يجب مراعاتها عند التقييم: -

- **درجة أهمية المشكلة التي عالجها.**
- **مدى صحة الحلول التي اقترحها.**
- **صدى النتائج التي توصل إليها.**
- **أهمية التوصيات التي تصورها لعلاج المشكلة.**
- **التأكد من سلامة استخدام المراجع الأصيلة واتباع الأساليب العلمية في البحث.**
- **التأكد من سلامة التعامل مع فرضيات البحث وإعطاء الحلول المنطقية.**
- **التأكد من سلامة استعراض الموضوع وتغطيته لجميع جوانبه.**
- **التأكد من سلامة الصياغة والتعبير والتوصل إلى النتائج.**
- **مراعاته للأمانة العلمية وحقوق الملكية الفكرية.**
- **تملكه اللغة وتطويعها في صياغة ما توصل اليه من نتائج.**

ضوابط العمل في المشروع

- **على كل طالب أن يختار موضوعاً من المواضيع المهمة التي تعالج مشكلة علمية نظرية أو عملية وكل حسب تخصصه. وفي سبيل تسهيل هذه المهمة يطرح الأستاذ المشرف عناوين للبحوث المقترحة تعرض على الطلبة لمساعدتهم في اختيار موضوع المشروع يراعي الأستاذ المشرف**

في العناوين المطروحة ملاءمتها للطالب باعتبارها عناوين للمشاريع وكذلك الاخذ في الاعتبار المدة الزمنية اللازمة لأجراء المشروع.

- يحدد القسم العلمي لكل طالب مشرفاً يتولى إرشاده في مسيرة مشروعه بعد الاتفاق على الموضوع.
- يلتزم الطالب عند كتابته المشروع بالأصول والضوابط العلمية من حيث التوثيق العلمي للمراجع والأمانة العلمية في اقتباس الأفكار والإشارة إلى أصحابها.
- يتولى الطالب تقديم عدد نسخ من المشروع بواقع عدد المحكمين + نسخه تحفظ فى القسم إلى القسم لتحديد موعد لتقييمه.
- يسلم الأستاذ المشرف استمارة تقييم المشروع المعتمدة إلى القسم بعد الانتهاء من التقييم مباشرة.

<u>**Checklist for Student Oral Presentation**</u>

This checklist is meant to guide you in preparation for a successful oral presentation of your graduation project:

☐ Introduce yourself to panel members.

☐ State the type of project you did.

☐ Describe, in detail, the procedures you followed in completing your project.

☐ Explain what you learned while completing your project.

☐ Describe how your project has impacted your personal growth.

☐Conclude your presentation by asking the panel members for questions.

<u>**The Oral Presentation will be judged on The Basis of The Following Categories**</u>

a. <u>*Content, which includes.*</u>

1.) 30-minute minimum presentation

2.) Supporting information

3.) Conclusions

4.) Importance, value, or impact of the project

5.) Sources of information

6.) Vocabulary relevant to the topic

b. <u>*Effective speaking, which includes.*</u>

1.) Presenting oneself with poise

2.) Maintains consistent eye contact with the review panel.

3.) Enunciates clearly.

4.) Varies tone, volume, and speed to enhance presentation.

5.) Speaks alone, without the aid of an interpreter.

c. *Organization*

1.) Is appropriate to the study.

2.) Use of an engaging beginning and thought fending.

3.) Supports a clear thesis or idea.

4.) Flows smoothly from one idea to the next

d. *Visual Media*

1.) Effective use of graphic design

2.) Communicates significant information.

3.) Clearly, accurately, and precisely communicates.

Information

4.) Photos should be mounted on poster board, organized in an album, or placed in a computer/slide presentation.

e. *Response to questions*

1.) Effectively responds to all questions from the panel.

2.) Uses questions from the panel to illustrate the effort done in your work and the strong points in your research.

توزيع علامات تقييم الاستاذ المشرف على مادة مشروع التخرج

اسم الطالب الأول:	
اسم الطالب الثاني:	
اسم الطالب الثالث:	

عنوان المشروع:	Title:
مكان التنفيذ:	Place:

المعيار	العلامة	العلامة الفعلية
حسن تنفيذ المشروع / الالتزام بالمواعيد ودقة التقارير	10	
نتائج المشروع من الناحية العلمية والعملية ومدى اكتمال تنفيذه	10	
طريقة توثيق المشروع لغة وتسلسل ومنطق واكتمال وتفصيل المشروع	10	
طريقة الأداء والشرح أثناء جلسة المناقشة	10	
المجموع العام لتقييم المشرف	40	

العنوان:	Address:
هاتف :	Phone:
البريد الإلكتروني :	Email:

اسم المشرف	**التوقيع والختم الرسمي**

.

تقرير لجنة المناقشة

عنوان المشروع:
....

المشرف المباشر: ....

منفذو المشروع	الرقم الجامعي

توثيق المشروع	العلامة من	العلامة الفعلية
مستوى اللغة المستخدمة في التوثيق	5	
مدى مطابقة التوثيق للمواصفات المطلوبة	4	
مطابقة التوثيق لما نفذ فعليا على أرض الواقع	4	
شمولية التوثيق لكافة جوانب الموضوع	4	
توفر المخططات والرسوم التوضيحية في التوثيق	5	
توفر المقدمات النظرية للموضوع	4	
توفر المرفقات المطلوبة من برامج وإنجازات ..	4	
أداء منفذ المشروع		
أسلوب العرض أثناء المناقشة	5	
أداء المنفذ أثناء الجلسة	5	
دقة الإجابات على أسئلة اللجنة	5	
حجم الأخطاء في أداء البرنامج	5	
مطابقة العمل المنفذ للمتطلبات	5	
استيعاب المنفذ لما نفذ من عمل	5	
المجموع العام لتقييم اللجنة	60	

اسماء اعضاء اللجنة	التوقيع
1-	
2-	
3-	

توصيف مقرردراسى
تغذية صحية (13م ك)

أ.إنتماء البرنامج

البرنامج المعني:برنامج بكالوريوس العلوم في الجيولوجيا
القسم الذي يقدم البرنامج:قسم علم الجيولوجيا
القسم الذي يقدم المقرر:قسم علم الحيوان
الفرقة / المستوى:المستوى الأول

ب .معلوماتأساسية

العنوان: التغذية الصحية	**الرمزالكودى:** 13م ك	**الفرقة / المستوى:** المستوى الأول
عددالوحداتالدراسية:	**النظرى: 2**	**العملى: 0**
	التمارين: 0	**الكلى:**ساعتان / الأسبوع

جـ. معلومات متخصصة

1. هدف المقرر:
الهدف من المقرر هو تعريف الطالب علي مكونات الوجبة الصحية وما يسببه نقص أي نوع من أنواع الوجبات الصحية. كما يهدف أيضا لتعليمه مفهوم التغذية العلاجية وأهدفها الأنظمة الغذئية وطرق إطعام المريض التغذية العلاجية لمرضى البول السكرى والكبد والكلية وحويصلات الجهازالبولى والمرارة وفقرالدم الناجم عن نقص الغذاء.

2. نواتج التعلم المستهدفه:

أ. المعلومات والمفاهيم:
أ1. يدرس العلاقة بين الغذاء والمغذيات ووظائف المغذيات الأساسية في الجسم واحتياجات الجسم للطاقة.
أ2. يتعرف علي أنواع وهضم وإمتصاص كل من الكربوهيدرات والبروتين والدهون.
أ3. يدرس أنواع الفينامينات والأملاح المعدنية واهميتها بالنسبة للجسم.
أ4.يتعرف علي ما يسببه نقص أي نوع من أنواع الوجبة والأمراض التي يسببها.
أ5.يتعرف على مفهوم التغذية العلاجية وأهدافها والأنظمة الغذئية وطرق إطعام المريض.
أ6.يدرس أعراض وأسباب والتغذية العلاجية لمرضى السكرى.
أ7- يتعرف على أعراض وأسباب والتغذية العلاجية لمرضى الكلى.
أ8.يدرس أعراض وأسباب والتغذية العلاجية لمرضى حويصلات الجهازالبولى.
أ9.يدرس أعراض وأسباب والتغذية العلاجية لمرضى الكبد والمرارة.
أ10.يتعرف على أنواع وأعراض واسباب والتغذية العلاجية لامراض سوء التغذية الناجمةعن نقص الغذاء(فقرالدم).

ب. المهارات الذهنية:
ب1. يربط بين وظائف المغذيات الأساسية واحتياجات الجسم لها.
ب2. يدرك العلاقة بين أنواع المغذيات وتأثيركل منهما علي الأخر.
ب3. يستنتج الأمراض التى تحدث نتيجة النقص اوالأفراط في تناول اي من الفيتامينات والأملاح المعدنية.
ب4. يستنتج انواع الغذاء المناسبة لمرضى السكرى والكلى والكبد والمرارة.
ب5. يستنتج انواع الغذاء التى يجب أن يتجنبها مرضى السكرى والكلى والكبد والمرارة.
ب6. يقارن بين أنواع حصيات الجهاز البولى.
ب7. يجمع بين أعراض وأسباب والتغذية العلاجية لأمراض الكبد والكلية.
ب8. يقارن بين أنواع سوء التغذية الناجمة عن نقص الغذاء (فقرالدم).

جـ. المهارات المهنية:

جـ1. يحدد الأضرارالتى تنتج عن نقص نوع معين من الغذاء.
جـ2. وصف غذاءعلاجى لبعض الامراض.
جـ3. يحدد الغذاء الصحى فى ضوء ما درسةعن انواع الغذاء.

د. المهارات العامة:

د1.بحث عن المعلومات والتعلم الذاتي.
د2.استخدام الكمبيوتروالانترنت

3.محتوى المقرر:

الموضوع	**ساعات**		
	النظرى	**العملى**	**التمارين**
• أساسيات التغذية والعلاقة بين الغذاءوالمغذيات. • مقدمة عن التغذية العلاجية وأهدفها.	2		
• انواع الكربوهيدرات وهضمها . • الأنظمة الغذئية وطرق إطعام المريض	2		
• أيض الكربوهيدرات وفوائدها. • التغذية العلاجية لمرضى البول السكرى	2		
• انواع البروتينات وهضمها . • الكلية ووظائفها والتغذية العلاجية لمرضى المتلازمة الكلائية.	2		
• أيض البروتينات وهضمها. • التغذية العلاجية لمرضى الالتهاب الكلوى الحاد والفشل الكلوى الحاد	2		
امتحان منتصف الترم	2		
• أنواع الدهون وهضمها. • التغذيةالعلاجية لمرضى حصيات الجهازالبولى	2		
• أيض الدهون وفوائدها. • التغذية العلاجية لمرضى التهاب الكبد الحاد وتشمع الكبد	2		
• الماء وأنواع الفيتامينات وخصائصها العامة. • التغذية العلاجية لمرضى الفشل الكبدي وزرع الكبد	2		
• الفيتامينات الذائبة في الماء. • التغذية العلاجية لمرضى التهاب المرارة	2		
• الفيتامينات الذائبة في الدهون. • أمراض سوء التغذية الناجمة عن نقص الغذاء (فقرالدم) أنواعها وأسبابها وأعراضها	2		
• الأملاح المعدنية كبيرة المقدار. • فقرالدم الناجم عن نقص الحديد	2		
• الأملاح المعدنية قليلة المقدار. • فقرالدم الناجم عن نقص والفولات و فيتامينB12	2		
مراجعة	2		
عددالساعات	28		

4.أساليب التعليم والتعلم:

		نواتج التعلم المستهدفه	المحاضرة	عروض وأفلام	المناقشات والندوات	حل المشاكل	العصف الذهنى
المعلومات والمفاهيم	أ1.	يدرس العلاقة بين الغذاء والمغذيات ووظائف المغذيات الأساسية في الجسم واحتياجات الجسم للطاقة.	✓	✓	✓		✓
	أ2.	يتعرف علي أنواع وهضم وإمتصاص كل من الكربوهيدرات والبروتين والدهون.	✓	✓	✓	✓	✓
	أ3.	يدرس أنواع الفيتامينات والأملاح المعدنية واهميتها بالنسبة للجسم.	✓	✓	✓	✓	✓
	أ4.	يتعرف علي ما يسببه نقص أي نوع من أنواع الوجبة والأمراض التي يسببها.	✓	✓	✓	✓	✓
	أ5.	يتعرف على مفهوم التغذية العلاجية وأهدافها والأنظمة الغذئية وطرق إطعام المريض.	✓	✓	✓		
	أ6.	يدرس أعراض وأسباب والتغذية العلاجية لمرضى السكرى.	✓	✓	✓	✓	✓
	أ7.	يتعرف على أعراض وأسباب والتغذية العلاجية لمرضى الكلى.	✓	✓	✓	✓	✓
	أ8.	يدرس أعراض وأسباب والتغذية العلاجية لمرضى حويصلات الجهاز البولى.	✓	✓	✓	✓	✓
	أ9.	يدرس أعراض وأسباب والتغذية العلاجية لمرضى الكبد والمرارة.	✓	✓	✓	✓	✓
	أ10.	يتعرف على أنواع وأعراض واسباب والتغذية العلاجية لامراض سوء التغذية الناجمةعن نقص الغذاء(فقرالدم).	✓	✓	✓	✓	✓
المهاراتالذهنية	ب1.	يربط بين وظائف المغذيات الأساسية واحتياجات الجسم لها.	✓	✓	✓	✓	✓
	ب2.	يدرك العلاقة بين أنواع المغذيات وتأثيركل منهماعلي الأخر.	✓	✓	✓	✓	✓
	ب3.	يستنتج الأمراض التى تحدث نتيجة النقص اوالأفراط في تناول اي من الفيتامينات والأملاح المعدنية.	✓	✓	✓	✓	✓
	ب4.	يستنتج انواع الغذاء المناسبة لمرضى السكرى والكلى والكبد والمرارة.	✓		✓	✓	✓
	ب5.	يستنتج انواع الغذاء التى يجب أن يتجنبها مرضى السكرى والكلى والكبد والمرارة.	✓		✓	✓	✓
	ب6.	يقارن بين أنواع حصيات الجهاز البولى.	✓	✓	✓	✓	✓
	ب7.	يجمع بين أعراض وأسباب والتغذية العلاجية لأمراض الكبد والكلية.	✓	✓	✓	✓	✓
	ب8.	يقارن بين أنواع سوء التغذية الناجمة عن نقص الغذاء (فقرالدم).	✓	✓	✓	✓	✓
المهاراتالمهنية	جـ1.	يحدد الأضرارالتى تنتج عن نقص نوع معين من الغذاء.	✓	✓	✓	✓	✓
	جـ2.	وصف غذاءعلاجى لبعض الامراض.	✓	✓		✓	✓
	جـ3.	يحدد الغذاء الصحى فى ضوء ما درسةعن انواع الغذاء.	✓		✓	✓	✓
المهاراتالعامة	د1.	بحث عن المعلومات و التعلم الذاتي.				✓	✓
	د2.	استخدام الكمبيوتر والانترنت.				✓	✓

5.تقويمالطلاب:

امتحان منتصف الفصل	الاسبوع السادس	10 ٪
امتحان الشفهى	الاسبوع الخامس عشر	10 ٪
امتحان نهاية الفصل	الاسبوع السادس عشر	80 ٪
المجموع	100 ٪	

6. قائمةالكتبالدراسيةوالمراجع:

أ. مذكرات:

مذكرة التغذية الصحية معتمدة من القسم

ب. كتب ملزمة

د. منى خليل عبدالقادر. كتاب التغذية العلاجية. الناشر: مجموعةالنيل العربية.2013.

جـ. كتب مقترحة

أ.د حسين رزق . كتاب أسس التغذية الصحية للبالغين. مصر.2002

د. دوريات علمية أونشرات

http://www.bu.edu.eg/staff/doaamohamed7-courses

http://www.bu.edu.eg/staff/marwaabdelmaksoud7-courses

7. الأدوات المستخدمة فى التعليم والتعلم:

جهازكمبيوتر– ميكروفون– جهازعرض ضوئى– شاشة عرض.

منسق المقرر: أ.د. ماجدة محمد العزبى
أ.د. مشيرة محمد عزت سليم

رئيس القسم: أ.د./ نصر الله عبدالحميد

التاريخ: 2023-2022

Course Specification
015Ur: English (1)

A. Affiliation

Relevant program: B.Sc. in Geology Program
Department offering the program: Department of Geology
Department offering the course: Department of Geology
Academic year/level: First level

B. Basic information

Title: English (1)	**Code:**015 Ur	**Year/level:** first level
Teaching Hours:	**Lectures:**2	**Tutorial:** 0
	Practical:0	**Total:**2 h/week

C. Professional information

1. Course Learning Objectives:

These courses are designed to enhance the students' capabilities on English Language in both writing and speaking.
- The courses focus on using appropriate grammatical structures and verb tenses.
- They present an integrated program of speaking and writing in English for students of Faculty of Science. They also help the student to understand terminology and provide the correct spelling and words most commonly used in scientific writing.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should be able to:

a1. Know new scientific vocabulary
a2. Know English grammar
a3. Know how to translate from English into Arabic and vice versa.
a4. know writing skills.

b. Intellectual skills:

On successful completion of the course, the student should be able to:

b1. Construct the scientific sentences.
b2. Interpret the Scientific paragraph.
b3. Apply on grammatical rule.
b4. Develop students’ proficiency of English and terminology

c. Practical and professional skills:

On successful completion of the course, the student should be able to:

c1. Collect the new vocabulary .
c2. Summarize the equivalents, opposites adjectives and nouns of the new words.

d. General skills:

In On successful completion of the course, the student should be able to:

d1. Communicate with others
d2. Work in group

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Reading comprehension	6		
Grammar	10		
Translation	4		
Writing skills	6		
Revision	2		
Total hours	**28**		

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Problem solving	Brain storming
Knowledge & Understanding	a1.	Know new scientific vocabulary .	✓	✓	✓		
	a2.	Know English grammar.	✓	✓	✓		
	a3.	Know how to translate from English into Arabic and vice versa .	✓	✓	✓	✓	
	a4.	know writing skills.	✓	✓	✓	✓	✓
Intellectual Skills	b1.	Construct the scientific sentences.	✓	✓	✓		
	b2.	Interpret the Scientific paragraph.	✓		✓	✓	✓
	b3.	Apply on grammatical rule.	✓		✓	✓	✓
	b4.	Develop student's proficiency of English and terminology.	✓	✓	✓		
Practical and professional	c1.	Collect the new vocabulary .				✓	✓
	c2.	Summarize the equivalents, opposites adjectives and nouns of the new words.	✓	✓	✓	✓	✓
General Skills	d1.	Communicate with others.					
	d2.	Work in group.					

5. Students' Assessment Methods and Grading:

Tools:	To Measure	**Time schedule**	**Grading**
Mid-Term Exam and report	a1, a2, b1 tob4, c1, c2, d1 and d2	sixth week	10 %
Oral exam	a1 to a4, b1 to b4 c1, c2 and d1	Fifteenth week	10 %

Written exam	a1 to a4 and b1 to b4	Sixteenth week	80 %
Total			100 %

6.List of references:

61. Course notes

Manual notes handle of University textbook

62. Required books

-English Grammar in Use by Raymond Murphy

63. Recommended books

- Longman (2003): Active Study Dictionary
- A practical English Grammar by A.J. Thomson and A.V. Martinent

64. Periodicals, Web sites, etc.

www.google.com
www.scincedirect.com

7. Facilities required for teaching and learning:

- Data show
- Using a black board

Course coordinator: Dr. Ghada El Sadek

Date: 2022-2023

Course Specification
030 UR: Computer Science (1)

A. Affiliation

Relevant program:	B.Sc. in Geology Program
Department offering the program:	Department of Geology
Department offering the course:	Mathematics Department
Academic year/level:	First level / First Semester

B. Basic information

Title:	**Code:**	**Year/level:**
Computer Science (1)	**030 UR**	First level / First Semester
	Lectures: 2h/week	**Tutorial: 0**
	Practical: 2h/week	**Total Hrs.:4 h/week**

C. Professional information

1. Course Learning Objectives:

At the end of this course, the students must be able to:
Reveal wide background knowledge related to different branches of computer science.
Use such knowledge and understanding in the modeling and design of computer-based systems in a way that demonstrate comprehension of tradeoff involved in design choices.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

At the end of this course, the students must be able to:
a1. Identify how the hardware and software are integrated to create computer systems and distinguish between selected forms of computer hardware architecture and operating system technology.
a2. Explain the definitions and the relation between the distinct numerical systems.
a3. Memories the programming concepts and the types of variables.
a4. Write a program using a selected language for solving a mathematical problem.

b. Intellectual skills:

At the end of this course, the students must be able to:
b1. Apply the knowledge and understanding of the computer-Science processes for modeling of real-world problems.
b2. Construct and solve abstract and mathematical models of computer and communications systems.

c. Practical and professional skills:

At the end of this course, the students must be able to:
c1. Prepare a program using a programming language for solving a real problem in professional practice.
c2. Demonstrate competence in the use of programming in problem solving.

d. General skills:

At the end of this course, the students must be able to:

d1. Think independently and solve problems on scientific basis.

d2. Work in a team effectively; manage time, collaborate and communicate with others positively.

d3. Deal with property rights legally and ethically.

3. Contents			
Topic	**Lecture hours**	**Tutorial hours**	**Practical hours**
Fundamentals of programming and computer languages (1)	**2**	**-**	**2**
Fundamentals of programming and computer languages (2)	**2**	**-**	**2**
Fundamentals of programming and computer languages (3)	**2**	**-**	**2**
Algorithm and Flowcharts (1)	**2**	**-**	**2**
Algorithm and Flowcharts (2)	**2**	**-**	**2**
Elements of Language under case	**2**	**-**	**2**
Revision and Mid-Term Exam	**2**	**-**	**2**
Basic Instructions in Language under case (1)	**2**	**-**	**2**
Basic Instructions in Language under case (2)	**2**	**-**	**2**
Control Instructions (1)	**2**	**-**	**2**
Control Instructions (2)	**2**	**-**	**2**
Arrays and dimension statement Some applications	**2**	**-**	**2**
Subprograms	**2**	**-**	**2**
Applications	**2**	**-**	**2**
Total hours	**28**	**-**	**28**

4 - Teaching and Learning methods:						
Intended Learning Outcomes	**Lecture**	**Presentations & Movies**	**Discussions & Seminars**	**Practical**	**Problem solving**	**Brain storming**

Knowledge & Understanding	**a1.**	**Identify how the hardware and software are integrated to create computer systems and distinguish between selected forms of computer hardware architecture and operating system technology.**	✓				✓	
	a2.	**Explain the definitions and the relation between the distinct numerical systems.**		✓			✓	
	a3.	**Memories the programming concepts and the types of variables.**	✓				✓	
	a4.	**Write a program using a selected language for solving a mathematical problem**	✓				✓	
Intellectual Skills	**b1.**	**Apply the knowledge and understanding of the computer-Science processes for modeling of real-world problems.**				✓		✓
	b2.	**Construct and solve abstract and mathematical models of computer and communications systems.**				✓		✓
Practical and professional skills	**c1.**	**Prepare a program using a programming language for solving a real problem in professional practice.**	✓				✓	
	c2.	**Demonstrate competence in the use of programming in problem solving.**	✓				✓	
General Skills	**d1.**	**Think independently and solve problems on scientific basis.**		✓	✓			
	d2.	**Work in a team effectively; manage time, collaborate and communicate with others positively.**		✓	✓			
	d3.	**Deal with property rights legally and ethically.**		✓	✓			

5. Students' Assessment Methods and Grading:

Tools:	**To Measure**	**Time schedule**	**Grading**
Mid-Term Exam	**a1, a2, b1**	**Week 7**	**14%**
Oral exam	**a1, a2, a3**	**Week 15**	**14 %**
Practical exams	**c1, c2**	**Week 15**	**14 %**
Written exam	**a1, a2, a3, a4,b1, b2**	**Start of the sixteenth week**	**48 %**
Total			**100 %**

6. List of references:

6.1. Course notes

-Notes approved by Math. Department

6.2. Required books.

J. Glenn Brookshear, D. Smith and D. Brylow,*Computer Science: An Overview, 11th Edition*, Marquette University Faculty, 2012.

6.3. Recommended books.

T.H. Cormen, C. E. Leiserson, R.L. Rivest and C. Stein, *Introduction to Algorithms, Second Edition*, McGraw-Hill Book Company, 2001.

6.4. Periodicals, Web sites, etc.

http://www.cs.bu.edu/courses/cs101/old/2013spring/slides/CS101.03.Bhttp://www.disi.unal.edu.co/~gjhernandezp/introisc/hide/[Computer.ScienceAn.Overview.(11th.2011)].J.Glenn.Brookshear.pdf

http://www.dcc.ufrj.br/~francisco_vianna/livros/Introduction.To.Algorithms.-.Cormen.-.2nd.Ed.pdf

7. Facilities required for teaching and learning:

Black board, white board and data show.

Course coordinator:	Dr. Mosab Hassan, Dr. Gamal Ahmed, Dr. Ahmed Mohamed, and Dr. Abeer El-Fishawy
Head of the Department	Prof. Dr. Reda Gamal Abd El Rahman Khaled

Date: **2022-2023**

Course Specification
Computer Science (2) – 040 UR

A. Affiliation

Relevant program: B.Sc. in Geology Program
Department offering the program: Department of Geology
Department offering the course: Mathematics Department
Academic year/level: First level / Second Semester
Date of specifications approval:

B. Basic information

Title:	**Code:**	**Year/level:**
Computer Science (2)	**040 UR**	First level /Second Semester
	Lectures: 1h/week	**Tutorial: –**
	Practical: 2h/week	**Total:2 h/week**

C. Professional information

1. Course Learning Objectives:

At the end of this course, the students must be able to:
This subject is aimed at students with little programming experience. It aims to provide students with an understanding of the role computation can play in solving problems. It also aims to help students, regardless of their major, to feel justifiably confident of their ability to write small programs that allow them to accomplish useful goals. The class will use a programming language, complementing to course 30 U.

2.Intended Learning Outcomes (ILOS)
a. Knowledge and understanding:
At the end of this course, the students must be able to:
a1. Outline the computer terms from the textbook, lecture, and readings.
a2. Explain the fundamental programming concepts such as variables, functions, loops and subroutines in a programming language.
a3. Identify application algorithm and use programming language.
a4. Write programs of real-world applications
b. Intellectual skills:
At the end of this course, the students must be able to:
b1. Construct programming in a selected programming language.
b2. developed code in programming language and adapt other people's code.
b3. Organize a detailed algorithmic solution to a well-defined problem.
b4. Design program to solve application problem.

c. Practical and professional skills:
At the end of this course, the students must be able to:
c1. Show the language syntax in programming problems.
c2. Recommended programming language to develop more reliable programs.

d. General skills:

At the end of this course, the students must be able to:

d1. Work effectively both in a team and independently.

d2. Learning information and communication technology effectively.

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Basics of programming.	1	-	2
Algorithms and flowcharts.	1	-	2
Basics of the programming language	1	-	2
Types of variables	1	-	2
Control statements (1)	1	-	2
Control statements (2)	1	-	2
Revision and mid-term exam	1	-	2
Loop statements (1)	1	-	2
Loop statements (2)	1	-	2
Array (1)	1	-	2
Array (1)	1	-	2
Functions (1)	1	-	2
Functions (2)	1	-	2
Some Applications.	1	-	2
Total hours	14	-	28

4. Teaching and Learning methods:

Intended Learning Outcomes			Lecture	Presentations & Movies	Discussions & Seminars	Practical	Problem solving	Brain storming
Knowledge & Understanding	a1.	Outline the computer terms from the textbook, lecture, and readings	✓					✓
	a2.	Explain the fundamental programming concepts such as variables, functions, loops and subroutines in a programming language	✓					✓
	a3.	Identify application algorithm and use programming language	✓				✓	

	a4.	**Write programs of real-world applications**	✓			✓		
Intellectual Skills	**b1.**	**Construct programming in a selected programming language.**	✓			✓		✓
	b2.	**Developed code in programming language and adapt other people's code.**	✓			✓		✓
	b3.	**Organize a detailed algorithmic solution to a well-defined problem.**	✓			✓		✓
	b4.	**Design program to solve application problem.**	✓			✓		✓
Practical and profession	**c1.**	**Show the language syntax in programming problems.**				✓		✓
	c2.	**Recommended programming language to develop more reliable programs.**				✓		✓
General Skills	**d1.**	**Work effectively both in a team and independently.**	✓			✓		✓
	d2.	**Learning information and communication technology effectively**	✓			✓		✓

5. Students' Assessment Methods and Grading:			
Tools:	**To Measure**	**Time schedule**	**Grading**
Mid-Term Exam	**a1, b1, b2**	**Week 7**	**14%**
Oral exam	**a1, a2, a3**	**Week 15**	**14 %**
Practical exams	**c1, c2, c3**	**Week 15**	**14 %**
Written exam	**a1, a2, a3, a4, b1, b2, b3, b4**	**Start of the sixteenth week**	**48 %**
Total			**100 %**

6. List of references:

6.1. Course notes

-Notes approved by Math. Department.

6.2. Required books.

B. H. Flowers, *An Introduction to Numerical Methods in C++*, Oxford, 2000.

6.3. Recommended books.

B. Stroustrup, *The C++ Programming Language, 3rd- Edition*, Addison-Wesley, 1997.

6.4. Periodicals, Web sites, etc.

https://www.coursera.org/course/cplusplus4chttp://www.Sciencedirect.com
http://www.Dbworld.com
https://www.edx.org/course/introduction-c-microsoft-dev210x
http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-096-introduction-to-c-january-iap-2011/

7. Facilities required for teaching and learning:

Black board, white board and data show.

Course coordinator:	Dr. Galal El-Salamony, Dr. Mosab Hassan, Dr. Magdy Mostafa, Dr. Essam Mohsen, and Dr. Hebba El-Sayed Fathy
Head of the Department:	Prof. Dr. Reda Gamal Abd El Rahman Khaled

Date: 2022-2023

Course Specification

050Ur: Human Rights

A. Affiliation

Relevant program: B.Sc. in Geology Program

Department offering the program: Department of Geology

Department offering the course: Entomology Department

Academic year/level: First level

B. Basic information

Title: Human Rights	**Code:** 050Ur	**Year/level:** First
Teaching Hours:	**Lectures:** 1	**Tutorial:** 0
	Practical: 0	**Total:**1 h/week

C. Professional information

1. Course Learning Objectives:

The objective of this course is to enable the student to learn the Rights law Human Medicine dementia and sources. Also, study of international law, which aims to protect the individual.

2. Intended Learning Outcomes (ILOS)

a. Knowledge and understanding:

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1. Deals with human rights.
a2. Explains the nature of the restrictions.
a3. Describes what the collective rights

b. Intellectual skills:

On successful completion of the course, the student should be able to.

b1. Analyzes of human rights.
b2. Assesses the extent of the exercise of human rights in his social life.
b3. Issued the provisions of a window on the importance of human rights

c. Practical and professional skills:

On successful completion of the course, the student should be able to.

c1. Compares the application of human rights in Egypt in various fields.
c2. Analyzes the social factors that stand in the way, without the actual application of human rights in our society.
c3. Puts imagine the implications of the application of human rights to professional practices in the future

d. General skills:

On successful completion of the course, the student should be able to.

d1. Deal with a computer and technology information in the field of specialization and view and search for information
d2. Think and proficient in team work.
d3. Mastered deductive reasoning

3. Contents

Topic	Lecture hours	Tutorial hours	Practical hours
Introduction	1	-	0
The concept of human rights	1	-	0
The origins and evolution of human rights part1	1	-	0
The origins and evolution of human rights part2	1	-	0
The importance of human rights and the philosophical framework	1	-	0
Sources of human rights law part1	1	-	0
Sources of human rights law part2	1	-	0
Types of Human Rights medication and meals part1	1	-	0
Types of Human Rights medication and meals part2	1		
The rights of women and children special needs Own	1		
The human right to a healthy environment	1		
Human Rights and Ethics part1	1		
Human Rights and Ethics part1	1		
Revision	1		
Total hours	**14**	**-**	**0**

4. Teaching and Learning methods:

Knowledge &Understanding	a1.	Deals with human rights.	✓		✓			
	a2.	Explains the nature of the restrictions	✓		✓			✓
	a3.	Describes what the collective rights	✓					✓
Intellectual Skills	b1.	Analyzes of human rights.	✓					
	b2.	Assesses the extent of the exercise of human rights in his social life.	✓					
	b3.	Issued the provisions of a window on the importance of human rights	✓	✓				
Practical and professional skills	c1.	Compares the application of human rights in Egypt in various fields.	✓	✓	✓	✓	✓	✓
	c2.	Analyzes the social factors that stand in the way, without the actual application of human rights in our society.	✓	✓				
	c3.	Puts imagine the implications of the application of human rights to professional practices in the future	✓	✓			✓	
	d1.	Deal with a computer and technology information in the field of specialization and view and search for information						
General Skills	d2.	Think and proficient in team work.	✓					✓
	d3.	Mastered deductive reasoning	✓					✓

5. Students' Assessment Methods and Grading:

Tools:	**To Measure**	**Time schedule**	**Grading**
Mid-Term Exam	a1 to a4, b1 to b2	Seventh week	20
Oral exam	a2, b2, d1 to d3	Thirteenth week	20
Written exam	a1 to a3, b1 to b3, c1 to c3	Fourteenth week	60
Total			**100 %**

6. List of references:

6.1. Course notes:

* non

6.2. Required books:

*** لغريب،محمد ميشال -حقوق الإنسان وحرياته الاساسية .د.م(:).د.ن) .،- 1989**

* Michael Boylan (2013). Natural Human Rights: A Theory

6.3. Recommended books:

أزمة حقوق الإنسان في الوطن العربي، 1989،مركزاتحادالمحامين العرب للبحوث والدراسات القانونية،1985-1989

* David Jason Karp (2012). Responsibility for Human Rights

6.4. Periodicals, Web sites, etc.

"الراصد :"شهرية .تصدرعن المشروع الاقليمي للوصل والمعلومات حول قضايا المرأة والمجتمع والتنمية فيمنطقتيالمشرقوالمغرب(. أعداد أخرى موجودة باللغتين الانكليزية والفرنسية على الكمبيوتر".) الراصد ."عددأيار2002

* Journal of Human Rights Practice: Oxford Journals
* Human Rights Law Review
* Journal of Human Rights at the University of Connecticut
* Canadian Journal of Human Rights
* http://www.humanrights.com/
* http://www.hrw.org/

7. Facilities required for teaching and learning:

* Lecture, Questions and discussion, Library and Self-Education

Course coordinator: **Asst. Prof. Mohamed Afifi**

Head of the Department: Prof. Dr. Gamal El Qot

Date: 2022-2023