

Third Stage/ Stratigraphy G301

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1. Educational Institution	College of Science/ University of Basrah
2. Department	Geology
3. Course name/Code 1. Programs included in it	Stratigraphy G301
4. Programs included in	Bachelor's, Master's, Doctorate
5. Attendance Form Available	Weekly
6. Semester/ Year	2019-2020
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 01/8/2020
9. Aims of the Course	
<p>Stratigraphy: is the science of rock strata.</p> <p>What does that mean?</p> <ul style="list-style-type: none">• Stratigraphy is concerned with age relationships of strata.• Successions of beds, local and worldwide correlation of strata.	

- Stratigraphic order and chronological arrangement of beds in the geological column.
- Stratigraphy gives you techniques for working out earth history.
- How earth and its life forms evolved?
- Test ideas on how varying combinations of processes affect the plants through time?
 - Together, history and process let you work out how, when, and why environments changed through time.
 - Stratigraphy also helps you to understand how many economic materials formed and got distributed in the way they did- and so will help you find more.

10.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

- Basic concepts of stratigraphy
- Tracing environments in space and time using stratigraphic tools.
- Interpreting geologic history.

b- Subjective- Specific Skills

- drawing the age relationships of strata.
- drawing the successions of beds, local and worldwide correlation of strata.
- recognize and interpret the stratigraphic order and chronological arrangement of beds in the geological column.
 - Drawing lithology and facies maps.
 - Represent the lithological cross section of beds through space and time.
 - Recognize the biozones and chronozone of beds.
 - Formal writing of stratigraphic information
 - understanding types of data required for stratigraphic software.

Learning Methods

Evaluating Methods

- 1- Daily test and reports
- 2- Monthly exams
- 3-Seminar
- 4- Final exams

C- Emotional and evolutionary goals

1. work and learn as team of workers.

2. Brainstorming of idea.

3- Observation and synthesis of different geological phenomena.

Learning Methods

1. Explanation and Discussion of the Lectures

2. conduct research and reports.

3. PowerPoint presentations.

d- General qualification skills transferred (other skills related to employability and personality development)

- Field work

- Work in team

- Using Stratigraphy software

- Artistic ability of observation, recognition and interpretation of earth phenomena.

- Representation of idea through space and time.

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1. Sequencing of course content

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2 ^{ed} , 3 ^{ed} weeks	2 h. lect. 2h. lab.	<p>Theoretical:</p> <ul style="list-style-type: none"> - Introduction Principles of Stratigraphy - Stratigraphic-Sedimentologic Data Base - Lithostratigraphic and Lithodemic Units <p>Practical:</p> <ul style="list-style-type: none"> • Formal writing of the basic stratigraphic information • draw the basic lithological section • Identify stratigraphic contacts • Using scale • Using symbol • Using Sedlog Software* 	<ul style="list-style-type: none"> - Formal writing of stratigraphic information - understanding and drawing basic stratigraphic and lithologic sections - understanding types of data required for stratigraphic software. 	Lectures and laboratory work	Writing report
4 th week, 5 th and 6 th weeks	2 h. lect. 2h. lab.	<p>Theoretical: - Biostratigraphy</p> <ul style="list-style-type: none"> • Definition • Facies fossils vs. zone fossils • Kinds of biostratigraphic units • Boundaries (biohorizontes) • Name of biozone • Good zone fossils • Graphic correlation with fossils • Composite standard section <p style="padding-left: 40px;">- Chronostratigraphy and Geochronology</p>	<ul style="list-style-type: none"> -Using fossils and ages of rocks as tools for stratigraphic division and correlation through space and time. -Understanding the geological time-scale 	Lectures and laboratory work	Writing report and quick exam

		<ul style="list-style-type: none"> • Kinds of geological-time units • Units based on material referents • Units independent of material referents • Chronostratigraphy • Ranks of chronostratigraphic units • Chronozone • Nomenclature • Stratotype • Geochronologic units • Ranks and nomenclature of geochronologic units • Diachronic units • Ranks and nomenclature of diachronic units <p style="text-align: center;">- First exam</p> <p>practical: Draw a correlation section</p> <ul style="list-style-type: none"> • draw regional stratigraphic section • Identify key beds • Draw correlation section • Using locations map for correlation <p>Using biostratigraphy data</p> <ul style="list-style-type: none"> • identify geological age using biostratigraphy • Record the biostratigraphic range • Identify biozones • Draw graphic biostratigraphy correlation 			
7th week, and 8th weeks	2 h. lect. 2h. lab.	<p>Theoretical:- Interpreting the record: Facies and Walther's Law</p> <ul style="list-style-type: none"> • Basic definitions • Scale of facies • Facies Criteria • Walther's Law of Facies <p style="text-align: center;">- Facies models</p> <ul style="list-style-type: none"> • Facies classification and interpretation • Facies relationships and facies association 	-Interpreting of stratigraphic sequence -recognize the effect of seal level changes	Lectures and laboratory work	Writing report

		<ul style="list-style-type: none"> Facies models and depositional environments <p>Practical:</p> <ul style="list-style-type: none"> - Stratigraphic map 1: Isopach map -Stratigraphic map 2: Facies map 			
9th week, and 10th weeks	2 h. lect. 2h. lab.	<p>Theoretical: - Cycles and cyclicity</p> <ul style="list-style-type: none"> • Concepts of cycle and sequence • The major types of stratigraphic cycle • Base level and eustasy • Allogenic controls on sedimentation • Autogenic controls on sedimentation • Scenarios of sea level <p>Practical:</p> <ul style="list-style-type: none"> -Using software -Surfer Software* 	Understanding the effects of climate changes and tectonic on stratigraphic records. -using stratigraphic software	Lectures and laboratory work	Writing report Quick exam
11th week, and 12th weeks	2 h. lect. 2h. lab.	<p>Theoretical: Sequence stratigraphy 1</p> <ul style="list-style-type: none"> • Introduction and historical development • Basic concepts • Sequence stratigraphic units • Sequence stratigraphic <p>Sequence stratigraphy 2</p> <ul style="list-style-type: none"> • Sequence stratigraphic surfaces • Hierarchy in sequence stratigraphy • Case study: sequence stratigraphy of nonmarine settings <p>Practical:</p> <ul style="list-style-type: none"> -Drawing Stratigraphic sections -Drawing Stratigraphic trap section 	-understanding the evolution of sedimentology and stratigraphy in the 21 Century through the concept of sequence stratigraphy	Lectures and laboratory work	Writing report

13 th week,	2 h. lect. 2h. lab.	Second exam Seminar (10 minute for each student to represent and discuss his/her research)		Exam	Student's presentation of research
14 th week, and 15 th weeks	2 h. lect. 2h. lab.	Theoretical: Sequence stratigraphy 3 <ul style="list-style-type: none"> • Case study: sequence stratigraphy of marine settings • Case study: sequence stratigraphy of nonmarine settings Practical : <ul style="list-style-type: none"> • identify sequence surface using subsurface data • Identify system tracts and sequence • Using different sequence schools for identify sequences • Draw subsurface correlation section 	-understanding different types of stratigraphic setting.	Lectures and laboratory work	Writing report Quick exam

11. Infrastructure	
1- Textbooks required for the course	<ul style="list-style-type: none"> - Brookfield, M.F.,2004. Principles of Stratigraphy. Blackwell Publishing, 340P. - North American Stratigraphic Code. , 2005. AAPG Bulletin, v. 89, no. 11, pp. 1547–1591. - Maill, A.D., (2016), Stratigraphy: A Modern Synthesis, Springer International Publishing AG Switzerland, 454P.
2 References	<ul style="list-style-type: none"> - Catuneanu, O., Galloway, W. E., Kendall, C. G. St., Miall, A. D., Posamentier, H. W., Strasser, A., and Tucker M. T., 2001. Sequence Stratigraphy: Methodology and Nomenclature. Newsletters on Stratigraphy, Vol. 44/3, pp. 173-245.
Recommended readings	<ul style="list-style-type: none"> - James, N.P & Dalrymple, R.W. (Edts.), 2010, Facies Model 4, Geological Association of Canada, IV Series, GeoText; 6, 575P. -https://www.nature.com/articles/d41586-019-02381-2 - https://www.nhm.ac.uk/discover/what-is-the-anthropocene.html - https://stratigraphy.org/ICSchart/ChronostratChart2020-03.pdf
Electronic website	<ul style="list-style-type: none"> - http://www.sepmstrata.org/page.aspx?pageid=15 - https://stratigraphy.org/guide/

12. Course Development Plan
Course development based on recent versions of books and references..

The adoption of modern interactive teaching methods.
Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.