

King Saud University
College of Sciences
Geology and Geophysics Department



جامعة الملك سعود
كلية العلوم
قسم الجيولوجيا والجيوفيزياء

The National Commission for Academic Accreditation & Assessment

Form (O)

Course Specification

GEO 334: Sedimentary Petrology

Revised April 2011



Course Specification

Institution	King Saud University
College/Department	College of Sciences / Department of Geology and Geophysics

A Course Identification and General Information

1. Course title and code: Sedimentary Petrology (334 GEO)
2. Credit hours: 3 (2+0+1)
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Geology (offered in the Department of Geology)
4. Name of faculty member responsible for the course Dr. Osama El-Sayed Ahmed Attia
5. Level/year at which this course is offered: Level 6
6. Pre-requisites for this course (if any): Introduction to Sedimentology and Stratigraphy – GEO 236
7. Co-requisites for this course (if any): None
8. Location if not on main campus <ul style="list-style-type: none">• All courses and labs are given in the Geology and Geophysical Department.• One three days field trip is required for this course. The field trip is out of Riyadh.

B. Objectives

<p>1. Summary of the main learning outcomes for students enrolled in the course.</p> <ul style="list-style-type: none"> • Acquisition of knowledge by learning new concepts; explaining the various sedimentary rocks; the description of different rocks; and presenting the corresponding environments where these rocks were formed. • Cognitive skills through thinking and use of experimental work. Recognition of the different rocks in the field. • The students are encouraged to use computer soft ware and use the net for retrieving information. • Student becomes responsible for their own learning through the given assignments, laboratory exercises, report writing and presentation in front of the whole class.
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field)</p> <ul style="list-style-type: none"> • The course contents will be periodically reviewed by the instructors and new materials can be added when necessary. • Some assignments are given to the students to encourage them to search in the net. Among many sites are: Saudi Geological Survey, Saudi Armco, Ministry of Petroleum and Minerals, United States Geological Survey, Geo-Arabia, Saudi Geological Society. This in addition to the related journals and periodicals. • One individual presentation is required if the student numbers allow. If the number is high , one presentation for each group of four or five. Each one presents part of the presentation.

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered		
Topic	No of Weeks	Contact hours
Introduction and fundamentals of sedimentary rocks.	1	(2+1)
Siliciclastic rocks: (conglomerates, breccia, sandstones, siltstones and claystones). Provenance of sandstones. Importance of sandstones containing water aquifers in the Kingdom of Saudi Arabia.	2	(4+2)
Carbonate rocks: (limestones and dolomite); their importance in oil reservoirs in the Kingdom of Saudi Arabia.	2	(4+2)
Evaporites: (rock salts, gypsum and anhydrite); and their importance as cap rocks.	1	(2+1)
Siliceous rocks; silicification. First mid-term exam	1	(2+1)
Phosphate rocks (phosphorates). Their economic importance in the kingdom.	1	(2+1)
Ironstones; stromatolites.	1	(2+1)
Coal; oil shale; manganese nodules.	1	(2+1)

Sedimentary environments: continental environments.	2	(4+2)
Sedimentary environments: transitional environments. - Second mid-term exam.	1	(2+1)
Sedimentary environments: marine environments.	2	(4+2)

2 Course components (total contact hours per semester):

Lectures: 30 hours /semesters; (2 hrs/ week); Laboratory : 45 hours /semester (3hrs/week) 2 days field trip.

3. Additional private study/learning hours expected for students per week. (This should be an average: for the semester not a specific requirement in each week)

- **Students are expected to accomplish an average of 3 learning hours per week.**

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- **A brief summary of the knowledge or skill the course is intended to develop.**
- **A description of the teaching strategies to be used in the course to develop that knowledge or skill.**
- **The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.**

a. Knowledge

(i) Description of the knowledge to be acquired

- **Knowledge and recognition of the different sedimentary rocks in the field, describe the hand samples and study them in the lab. The students are also required to examine and study the thin sections representing the different rocks under the microscope.**
- **The students also examine and collect the fossils if they find any.**

(ii) Teaching strategies to be used to develop that knowledge

- **Course materials are delivered through a sequential delivery of lectures.**
- **Interactive learning process through questions and answers in class and lab.**
- **Laboratory work, engaging students to plan and coordinate tests.**
- **Field trip is required to give the student a direct look and contact with the different rocks. During the field trip the student has to collect samples for the class and for his own collection.**

<p>(iii) Methods of assessment of knowledge acquired</p> <ul style="list-style-type: none"> • Exams, homework and lab reports are used to assess the acquired knowledge on the subject. • Oral presentation is given to examine the students' ability to perform and to show their knowledge of the subject.
<p>b. Cognitive Skills</p>
<p>(i) Cognitive skills to be developed</p> <ul style="list-style-type: none"> • Students will be able to apply the knowledge of the different sedimentary rocks and realize what they contain in their bodies. • They apply their knowledge in relation to the economy of the country, especially for searching water, minerals and oil embedded in these rocks. This is imperative for job hunting after graduation. • They should be able to assess the importance of each rock type in other domains, such as building, dam construction. The engineer should consult the geologist for the soil and the bed rock under any building or any other construction.
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <ul style="list-style-type: none"> • Lectures are supported by illustration, hand outs and sometimes with presentation. Lectures are followed by numerous examples, some of which are practical in nature, to illustrate the application and use. • Laboratory work is planned to teach the student how to recognize easily and to distinguish between the different rocks, in the field, in hand specimen and under the microscope as well. • Engage students in classroom and laboratory discussion with questions and answers.
<p>(iii) Methods of assessment of students cognitive skills</p> <ul style="list-style-type: none"> • Exams and homework will be emphasized on the rocks which contain important resources. . • Laboratory reports prepare the student to deal with different methods, data analysis and interpretation .
<p>c. Interpersonal Skills and Responsibility</p>
<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p> <ul style="list-style-type: none"> • Punctual attendance of classes and laboratory session is required of the students.. • Students will take the responsibility to accomplish any given assignment or home work on their own and submit them on time. • Students learn to manage their time in self study of the coarse material.

<p>(ii) Teaching strategies to be used to develop these skills and abilities</p> <ul style="list-style-type: none"> • Assignments are given to the students at regular intervals to give them time to accomplish and submit on time. Late or no submission of assignments carries penalties or loss of part of the grade points. • Laboratory reports are to be written in the prescribed format and are to be submitted on time. • Field trip attendance is required for the course. Some questions about the field are given at least in one of the exams • Participation of students in classroom discussion is encouraged.
<p>(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility</p> <ul style="list-style-type: none"> • Class attendance of students at the beginning of the lecture is recorded. • Lab, and field trip attendance is imperative and it is recorded. • Submission of assignment and home work is also recorded.
<p>d. Communication, Information Technology and Numerical Skills</p>
<p>(i) Description of the skills to be developed in this domain.</p> <ul style="list-style-type: none"> • Ability of students to apply basic knowledge of computer. • Use of computer in search for additional knowledge and in producing lab reports and assignments. • Ability to write some reports using important terms in English
<p>(ii) Teaching strategies to be used to develop these skills</p> <ul style="list-style-type: none"> • Questions of tests and assignments require students' knowledge of important subjects. • Questions include important English terms to familiarize the students to the foreign language. • Some assignments include some computer search.
<p>(iii) Methods of assessment of students numerical and communication skills</p> <ul style="list-style-type: none"> • Assigned grades for each assignment, report ,exams are recorded. • Lab assignments are graded and recorded. • Extra grades might be added for good participation in class and in the field. • All grades are added and the total is given after the finals.

e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required Not applicable
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students psychomotor skills

5. Schedule of Assessment Tasks for Students During the Semester			
Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Homework, (and one field trip report – only once).	Every three weeks	20%
2	13 lab reports, each for a new test	Weekly	20%
3	First mid-term exam	Within the sixth week	10%
4	Second mid-term exam	Within the 13 th week	10%
5	Final Exam	As scheduled by the registrar	40%

D. Support

<p>1. Arrangements for availability of faculty for individual student consultations and academic advice. (include amount of time faculty are available each week)</p> <ul style="list-style-type: none"> • I am available in the office to devote as much as it takes to answer any question related to the course. I am also available for any academic advice and consultation. • Office hours are posted, but I am available almost the entire working day.

E. Learning Resources

<p>1. Required Text(s):</p> <ul style="list-style-type: none"> • " Sedimentary Petrology" by: Robert Folk; Translated by: Ahmad A. Al-Aswad; King Saud University Publications. • "Sedimentary Petrology" by: Maurice Tucker; Blackwell Scientific Publications.
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<p>2. Essential References</p> <ul style="list-style-type: none"> • "Sedimentary Geology" by: Donald R. Prothero and Fred Schwab; W.H.Freeman and Co. • "Principles of Sedimentology" by Mohammad A. Moshrif; King Saud University Publications. • "Field Description of Sedimentary Rocks" by: Maurice Tucker: Translated by: Mohammad H. Basyoni and Ahmad M. Mursi; King Abdulaziz University Publications. • Selected handouts and reference materials on sedimentary rocks and sedimentary petrology. • Lab handouts are prepared for this course.
<p>3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)</p> <ul style="list-style-type: none"> • Journal of King Saud University(Science); Journal of Sedimentary Geology; Geological Society of America; American Association of Petroleum Geologists; Journal of Micropaleontology; Geo-Arabia; Journal of Petroleum Geology; Arabian Journal of Geosciences. • The instructor will provide a list of references for the students, as the course contains diverse topics.
<p>4-.Electronic Materials, Web Sites etc.</p> <ul style="list-style-type: none"> • Among many recommended sites are: Saudi Geological Survey, Saudi Armco, Ministry of Petroleum and Minerals, United States Geological Survey, Maaden, Geo-Arabia, Saudi Geological Society and all related journals and periodicals. • Search through Google for related topics.
<p>5- Other learning material such as computer-based programs/CD, professional standards/regulations</p> <ul style="list-style-type: none"> • The instructor may provide some relevant materials and learning aids.

F. Facilities Required

<p>Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)</p>
<p>1. Accommodation (Lecture rooms, laboratories, etc.)</p> <ul style="list-style-type: none"> • Lecture room is equipped with a black board, overhead projector, data show, and computer. • Fully equipped laboratories with binoculars, polarizing microscopes and other needed equipments. <p>All field equipments are required for the three day field trip.</p>
<p>2. Computing resources</p> <ul style="list-style-type: none"> • An easily accessible computer lab in the department and in the college. • GIS lab is available in the department.

<p>3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)</p> <ul style="list-style-type: none"> • The laboratory is equipped with binoculars, polarizing microscopes and other needed equipments. Some labs are equipped with data show and computer. Brunton compass, hand level, lens, hammer , chisel, and sample bags are required for the field trip. • Samples of different rocks and minerals are available in the lab.

G. Course Evaluation and Improvement Processes

<p>1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching</p> <ul style="list-style-type: none"> • Student course evaluation at the conclusion of the course.
<p>2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department</p> <ul style="list-style-type: none"> • Faculty assessment of the course and effectiveness of teaching delivery. • Periodic self- assessment of the program.
<p>3 Processes for Improvement of Teaching</p> <ul style="list-style-type: none"> • A committee assigned by the department will review deficiencies based on the student evaluation, faculty input, course file, and program assessment. • Feedback from employers and alumni surveys and graduating students' input are used to identify any deficiencies in students' ability in applying knowledge. • Workshops are organized on effective teaching methods to enable instructors to improve their teaching skill. • Teaching method will focus on students' learning and on course learning outcomes.
<p>4. Processes for verifying standards of student achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)</p> <ul style="list-style-type: none"> • A committee assigned by the department will review samples of student work in this course to check on the standard of grades and achievements. • A committee of faculty members can evaluate the course material and the students' work to compare the standard of grades and achievements compared to other known universities. This evaluator will also comment on the laboratory facilities and the adequacy of the equipment used in the lab.
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> • The department intend to apply periodical self- assessment and might rely on external assessment by an invited faculty member or consultant. • The feedback received from these assessments will be used to plan for further improvement in the course syllabus, teaching method, and delivery of course materials.