Texas a&m university – corpus christi
college of science and technology

Proposal for new course/elective

Course number: geol 46xx
Instructor: James R. Garrison, Jr.

Credit hours: 6
Semester: summer
Year: 2009

Course title: Field Geology

1. Course description:

This 6 credit hour, senior-level course is for geology majors and environmental science, who would like a better understanding of the basic principles of field mapping and outcrop data collection in outcrops of all types. The 5-6 week course will involve a variety of mapping and data collection and analysis problems on the Texas Gulf Coast and in West Texas, New Mexico, and Utah. Initially, the course will be offered every two years. The participant is responsible for supplying all necessary camping gear, field notebook, hand lens, rock hammer, drafting supplies, and camera.

2. Attach course outline or syllabus and a statement of course goals and objectives

See attached syllabus

3. What group or groups of students is the course designed for?

Senior-level undergraduates majoring in geology or environmental science

4. What is your best estimate of potential enrollment? What is the estimate based on?

Potential enrollment: ~10-20; based on current and past enrollment numbers in geology introduction to field methods and field seminar courses on the same subject offered in Maymester 2007 and Fall 2007 and on anticipated enrollment in the same classes in 2008.

5. What degree and/or teacher certification requirements will this course fulfill?

This course provides geology majors and environmental science majors with an earth science or earth systems emphasis with an understanding of the basic principles of paleontology, sedimentology, structural geology, and petrology by providing an intensive field mapping and data collection experience in which they will be required to complete at least 5 five to six day field projects. This course fills a need for geology majors and environmental science majors to have an understanding of basic field mapping and data collection techniques.

6. Are present library and other university resources adequate to support this course?
The students will be required to supply their own camping equipment, field book, hand lens, rock hammer, drafting supplies, and camera. Transportation will be by University or rental vehicles. Access to special field equipment such as Brunton compasses and GPS systems is adequate for course needs and course time schedules.

7. **Comments:**

Currently geology majors are required to complete a 6 credit geology field camp course, although one is not currently offered by Texas A&M University Corpus Christi. In general, field camp grades do not transfer. Given these conditions, it is in the best interest of TAMUCC geology majors for TAMUCC to offer its own field camp. Such a camp offered every two years could easily filled by students currently enrolled in the geology program. The costs of the camp would be covered by field trip fees and tuition.
Course Description

This 6 credit hour, senior-level course is for geology majors and environmental science, who would like a better understanding of the basic principles of field mapping and outcrop data collection in outcrops of all types. The 5-6 week course will involve a variety of mapping and data collection and analysis problems on the Texas Gulf Coast and in West Texas, New Mexico, and Utah. Initially, the course will be offered every two years. The participant is responsible for supplying all necessary camping gear, field notebook, hand lens, rock hammer, drafting supplies, and camera.

Participants should be prepared to make extended hikes in rough terrain and at moderate altitudes. Proper clothing and footwear for these types of excursions are essential and required.

Prerequisites: Introduction to Field Methods, Field Seminar, Invertebrate Paleontology, Sedimentation and Stratigraphy, Structural Geology, and Igneous and Metamorphic Petrology

Course Goals and Objectives

Upon completion of this course, the participant should:

1. understand the basic principles of describing clastic sedimentary, igneous, and metamorphic rocks in the field
2. understand the basic concepts and models of modern clastic aeolian, fluvial, deltaic, and shoreline depositional systems
3. be able to construct a detailed geologic map in areas containing volcanic, sedimentary, and metamorphic rocks
4. be able to recognize, quantify, analyze, and interpret geologic structures in the field
5. be able to measure detailed measured sections of clastic sedimentary structures in the field
6. be able to construct geologic cross-sections from geologic data collected in the field
7. understand the basic principles of depositional sequence stratigraphy of rocks in outcrop

Evaluation and Grade Assignment

Grades will be based on:
A) Performance in the field (10% of grade), i.e. how effectively you work in the field, address and interpret the sedimentological systems, etc., as assessed through your interaction with the instructor.

B) Evaluation of field notes and projects generated and completed during the course (90%).

Fees

A course fee of $2000.00 will be collected to cover food costs, camping and park entrance fees, transportation costs, and costs of expendable field supplies and maps. The participant is responsible for supplying all necessary camping gear, field notebook, hand lens, rock hammer, drafting supplies, and camera.

Class Policies

Attendance of all field days is mandatory. While group discussion and collaboration is encouraged during the trip, unless work is explicitly specified to be a team project, the work you hand in is expected to be yours. Please note that alcohol and drug policies are strictly enforced. Violations will result in immediate expulsion and a failing grade.

Textbook

none

Supplies

Field notebook, pencils, camera, camping equipment, hand lens, rock hammer, drafting supplies, hiking gear, proper footwear

Field Projects:

Data collection and analysis along the Modern Gulf Coast of Texas
Mapping project in the Marathon fold and thrust belt, West Texas
Mapping project in the volcanic rocks of the Big Bend Region of West Texas
Mapping project in the metamorphic rocks of West Texas or Northern New Mexico
Measured sections and photomosaic interpretation in the Cretaceous clastics of east-central Utah
Mapping project in the Paradox salt basin of southeastern Utah near Moab
Paleocurrent data analysis of aeolian rocks of the Colorado Plateau
Course Number: GEOL 43xx  
Instructor: James R. Garrison, Jr.

Credit Hours: 3  
Semester: Spring  
Year: 2009

Course Title: Modern Clastic Shoreline Depositional Systems

1. Course Description:

This upper division course is for geology majors and environmental science, who would like a better understanding of the basic principles of modern shoreline depositional systems and sedimentology and the preservation of these systems in the rock record. The course will examine modern depositional systems exposed along the Texas Gulf coast and will provide a field introduction to the basic concepts of clastic sedimentology for those new to the subject and a comprehensive review for those familiar with the basic ideas of sedimentology. The class will consist of 6 2-hour lectures and 5 days of field excursions in the area between Galveston, Texas and North Padre Island near Corpus Christi, Texas. The participant is responsible for supplying all necessary camping gear, field notebook, and camera.

2. Attach course outline or syllabus and a statement of course goals and objectives

See attached syllabus

3. What group or groups of students is the course designed for?

Senior-level undergraduates majoring in geology or environmental science

4. What is your best estimate of potential enrollment? What is the estimate based on?

Potential enrollment: ~10-20; based on current and anticipated enrollment numbers in geology and environmental science and a special topics course on the same subject offered in Spring 2007..

5. What degree and/or teacher certification requirements will this course fulfill?

This course provides geology majors and environmental science majors with an earth science or earth systems emphasis with an understanding of the basic principles of modern shoreline depositional systems and sedimentology by providing an intensive field experience in which they will observe modern shoreline processes and discuss the preservation potential of these systems in the rock record. This course fills a need for geology majors and environmental science majors to have an understanding of clastic sedimentology from a field perspective.
6. *Are present library and other university resources adequate to support this course?*

The students will be required to supply their own camping equipment, field book, and either a digital or disposable film camera. Transportation will be by University vehicles and boats. Access to personal computers, etc. necessary to generate the final project is adequate for course needs and course time schedules.

7. *Comments:*

A preliminary special topics version of this course was offered to undergraduate and graduate students in both geology and environmental science in Spring 2006. All participants that attended felt they acquired an enhanced understanding of the basic principles of modern shoreline depositional systems and sedimentology and of the preservation potential of these systems in the rock record. They reported the field experience essential to their understanding of the subject material, as well as being a stimulating and motivating experience.
Course Description

This class is intended for junior and senior-level geology majors and environmental science majors who would like a better understanding of the basic principles of modern depositional systems and sedimentology. The course will examine modern depositional systems exposed along the Texas Gulf coast. This course will provide a brief field introduction to the basic concepts of clastic sedimentology, neoichnology, and sequence stratigraphy for those new to the subject and a comprehensive review for those familiar with the basic ideas of sedimentology and sequence stratigraphy. The class will consist of 6 2 hour lectures and 5 days of field excursions in the area between Galveston, Texas and North Padre Island near Corpus Christi, Texas.

Participants should be prepared to make short hikes, travel in boats, and occasionally enter the waters of the Gulf and the back barrier bays and lagoons. Proper clothing and footwear for these types of excursions are essential and required.

Prerequisites: Physical Geology (or equivalent), Sedimentation and Stratigraphy (or equivalent) or permission of the instructor

Course Goals and Objectives

Upon completion of this course, the participant should:

(1) understand the basic principles of clastic sediment transport and deposition
(2) understand the basic concepts and models of modern clastic aeolian, fluvial, deltaic, and shoreline depositional systems
(3) be able to identify the basic bedforms and sedimentary structures in the field
(4) understand the factors controlling clastic sediment deposition
(5) be able to describe and interpret clastic sedimentary structures in the field
(6) understand the preservation potential of shoreline deposits in the rock record
(7) understand the basic principles of depositional sequence stratigraphy

Evaluation and Grade Assignment

Grades will be based on:

A) Performance in the field (20% of grade), i.e. how effectively you work in the field, address and interpret the sedimentological systems, etc., as assessed through your interaction with the instructor
B) A comprehensive examination will be given at the conclusion of the course (20% of grade).
C) Evaluation of field notes generated during the course (20%). (Based on the completeness, observational skills, and documentation of field trip stops in a field notebook).

D) Teams will design a virtual field trip or conduct a field research project (40% of grade) to be submitted one week before the conclusion of the course. (These assignments can be submitted to the instructor as Powerpoint presentations or as html web-ready documents (virtual field trips) or as pdf files (research projects).)

Fees

A course fee of $200.00 will be collected to cover food costs, camping and park entrance fees, and land and sea transportation costs. The participant is responsible for supplying all necessary camping gear, field notebook, and camera.

Class Policies

Attendance of all field days and the introductory lecture session is mandatory. While group discussion and collaboration is encouraged during the trip, unless work is explicitly specified to be a team project, the work you hand in is expected to be yours. Please note that alcohol and drug policies are strictly enforced. Violations will result in immediate expulsion and a failing grade.

Textbook

Sandstone Depositional Environments
Author: Scholle and Spearing (eds.)
Publisher: AAPG Memoir 31

The Sedimentology, Neoichnology, and Preservation Potential of Primary Deltaic and Associated Secondary Shoreline Beach and Barrier Island Depositional Facies (Field Trip Guidebook)
Author: Garrison (ed.)

Sandstone Facies Models Response to Sea Level Change (Required)
Author: Walker and James (eds.)
Publisher: Geological Association of Canada
ISBN: 0-919216-49-8

Supplies

Field notebook, pencils, camera, camping equipment

Lectures

Fluvial Depositional Systems
Deltaic Depositional Systems
Shoreline Depositional Systems
Estuarine Depositional Systems
Depositional Sequence Stratigraphy II
Basics of Ichnology (Trace Fossils)

**Field Excursions:**
North Padre and Mustang Barrier Islands
Ingleside Barrier
Nueces Incised Valley
Brazos River Delta
San Luis Pass Tidal Delta
PROPOSAL FOR NEW COURSE/ELECTIVE

Course Number: GEOL 53xx
Instructor: James R. Garrison, Jr.

Credit Hours: 3
Semester: Spring
Year: 2009

Course Title: Clastic Shoreline Sedimentology and Benthic Ecology

1. Course Description:

   This graduate-level course is for coastal and marine systems science and environmental science majors and professional geologists, who would like a better understanding of the basic principles of modern shoreline depositional systems and sedimentology and the ecosystems associated with them and the preservation of these systems in the rock record. The course will examine modern depositional systems exposed along the Texas Gulf coast and their benthic invertebrate ecology. The class will consist of classroom lectures and 7 days of field trips, in the area between Galveston, Texas and Baffin Bay. The participant is responsible for supplying all necessary camping gear, field notebook, and camera.

2. Attach course outline or syllabus and a statement of course goals and objectives

   See attached syllabus

3. What group or groups of students is the course designed for?

   Graduate-level undergraduates majoring in coastal and marine systems science and environmental science

4. What is your best estimate of potential enrollment? What is the estimate based on?

   Potential enrollment: ~5-10; based on current and anticipated enrollment numbers in coastal and marine systems science and environmental science and a special topics course addressing the sedimentological portion of this proposed course that was offered in Spring 2007..

5. What degree and/or teacher certification requirements will this course fulfill?

   This course provides coastal and marine systems science and environmental science majors an understanding of the basic principles of modern shoreline depositional systems and sedimentology and the ecosystems associated with these depositional systems by providing an intensive lecture and field experience in which they will observe modern shoreline processes, modern benthic invertebrate ecosystems and discuss the preservation potential of these systems in the rock record. This course fills a need for coastal and marine systems
science and environmental science majors to have an understanding of clastic sedimentology and the associated ecosystems from both a conceptual and a field perspective.

6. *Are present library and other university resources adequate to support this course?*

   The students will be required to supply their own camping equipment, field book, and either a digital or disposable film camera. Transportation will be by University vehicles and boats. Access to personal computers, etc. necessary to generate the final project is adequate for course needs and course time schedules.

7. *Comments:*

   A preliminary special topics version of the sedimentological portion of this course was offered to undergraduate and graduate students in both geology and environmental science in Spring 2006. All participants that attended felt they acquired an enhanced understanding of the basic principles of modern shoreline depositional systems and sedimentology and of the preservation potential of these systems in the rock record. They reported the field experience essential to their understanding of the subject material, as well as being a stimulating and motivating experience. An integration of invertebrate ecosystems with this sedimentological information will greatly improve student understanding of the dynamic and fragile nature of modern coastal systems and the potential for these modern systems to be used as analogs in paleo-environmental and paleo-ecological interpretations of the ancient rock successions in the rock record.
Course Description

This graduate-level course is for coastal and marine systems science and environmental science majors, who would like a better understanding of the basic principles of modern shoreline depositional systems and sedimentology and the eco-systems associated with them and the preservation of these systems in the rock record. The course will examine modern depositional systems exposed along the Texas Gulf coast and their benthic invertebrate ecology. The class will consist of classroom lectures and 5-7 days of field trips, in the area between Galveston, Texas and Baffin Bay.

Participants should be prepared to make short hikes, travel in boats, and occasionally enter the waters of the Gulf and the back barrier bays and lagoons. Proper clothing and footwear for these types of excursions are essential and required.

Prerequisites: Graduate standing, Physical Geology (or equivalent), Sedimentation and Stratigraphy (or equivalent) or permission of the instructor

Course Goals and Objectives

Upon completion of this course, the participant should:

(1) understand the basic principles of clastic sediment transport and deposition
(2) understand the facies concept of deposition systems
(3) understand the basic concepts and models of modern clastic aeolian, fluvial, deltaic, and shoreline depositional systems
(4) be able to identify the basic bedforms and sedimentary structures in the field.
(5) understand the factors controlling clastic sediment deposition
(6) be able to describe and interpret clastic sedimentary structures in the field
(7) understand the preservation potential of shoreline deposits in the rock record
(8) understand the basic principles of depositional sequence stratigraphy
(9) be able to identify the major burrowing and trace-making benthic invertebrates and their ecological niches
(10) be able to identify the ichnogenera of the major traces produced by clastic shoreline benthic invertebrates
(11) understand the basic principles of ichnology and its uses in interpreting the rock record

Evaluation and Grade Assignment
Grades will be based on:

A) Performance in the field (5% of grade), i.e. how effectively you work in the field, address and interpret the sedimentological systems, etc., as assessed through your interaction with the instructor
B) A comprehensive midterm examination (20%)
C) A comprehensive final examination (20%)
D) Evaluation of field notes generated during the course (15%). (Based on the completeness, observational skills, and documentation of field trip stops in a field notebook).
E) Students will conduct a field research project (40% of grade) to be submitted one week before the conclusion of the course.

Fees

A course fee of $200.00 will be collected to cover food costs, camping and park entrance fees, land and sea transportation costs, and guidebook reproduction costs. The participant is responsible for supplying all necessary camping gear, field notebook, and camera.

Class Policies

Attendance of all field days and lectures is mandatory. While group discussion and collaboration is encouraged during the trip, unless work is explicitly specified to be a team project, the work you hand in is expected to be yours. Please note that alcohol and drug policies are strictly enforced. Violations will result in immediate expulsion and a failing grade.

Textbook

Sandstone Depositional Environments
Author: Scholle and Spearing (eds.)
Publisher: AAPG Memoir 31

Sandstone Facies Models Response to Sea Level Change
Author: Walker and James (eds.)
Publisher: Geological Association of Canada
ISBN: 0-919216-49-8

The Sedimentology, Neoichnology, and Preservation Potential of Primary Deltaic and Associated Secondary Shoreline Beach and Barrier Island Depositional Facies (Field Trip Guidebook)
Author: Garrison (ed.)
Provided on CD-Rom

Supplies
Field notebook, pencils, camera, camping equipment

**Lecture Topics**
Sediment Transport
Fluvial Depositional Systems
Deltaic Depositional Systems
Shoreline Depositional Systems
Estuarine Depositional Systems
Benthic Ecology of Modern Micro-tidal Shoreline Systems
Basics of Ichnology (Trace Fossils)
Fundamentals of Paleoenvironmental Interpretations
Depositional Sequence Stratigraphy I
Depositional Sequence Stratigraphy II

**Field Excursions:**
North Padre and Mustang Barrier Islands
Nueces Incised Valley Estuary System
Ingleside Barrier Complex and Oso Bay
Laguna Madre and Baffin Bay
Colorado and Brazos Rivers
Brazos River Delta
San Luis Pass Tidal Delta
Course Number: GEOL 53xx  Instructor: James R. Garrison, Jr.
Credit Hours: 3  Semester: Fall  Year: 2008
Course Title: Advanced Geophysical Techniques Seminar

1. Course Description:

This graduate-level course is for coastal and marine systems science and environmental science majors and professional petroleum geologists who would like a better understanding of the latest advanced geophysical techniques and principles available to geoscientist working subsurface problems. The course will consist of an examination of the latest topics, techniques, and software. The class will consist of many hands-on introductions to the latest software. New techniques and topics will be presented by geology staff and visiting experts working in those fields.

2. Attach course outline or syllabus and a statement of course goals and objectives

See attached syllabus

3. What group or groups of students is the course designed for?

Graduate-level students majoring in coastal and marine systems science and environmental science and professional geologist desiring advanced continuing education and graduate credit hours

4. What is your best estimate of potential enrollment? What is the estimate based on?

Potential enrollment: ~10-20; based on current and anticipated enrollment numbers in geology, coastal and marine systems science, and environmental science and a polling of local professional geologists.

5. What degree and/or teacher certification requirements will this course fulfill?

This course provides coastal and marine systems science and environmental science majors an understanding of the latest advanced geophysical techniques and principles available to geoscientist working subsurface problems by providing an intensive lectures and hands-on computer software experiences in which they can learn the applications and theory of the latest geophysical techniques. This course fills a need for coastal and marine systems science and environmental science majors and professional geoscientists to have a better understanding of the latest advanced geophysical techniques and principles available.
6. *Are present library and other university resources adequate to support this course?*

   The computer facilities at the Center for Water Supply Studies has been solicited for this course.

7. *Comments:*

   There has been multiple inquires and requests for a course such as this from the local geoscience community, with the assurance that the 10-20 enrollment could be easily met as part of the continuing education commitment of local energy companies and consulting companies. This opportunity also serves to expose our graduate students to the latest innovations in advanced geophysical techniques that will prepare them for future projects requiring such knowledge.
Course Description

This graduate-level course is for coastal and marine systems science and environmental science majors and professional petroleum geologists who would like a better understanding of the latest advanced geophysical techniques and principles available to geoscientist working subsurface problems. The course will examine the latest topics, techniques, and software. The class will consist of many hands-on introductions to the latest software. New techniques and topics will be presented by geology staff and visiting experts working in those fields.

Prerequisites: Graduate standing, Sedimentation and Stratigraphy (or equivalent), Geophysics, or permission of the instructor (with appropriated professional work experience).

Course Goals and Objectives

Upon completion of this course, the participant should:

1. understand the latest principles and limitations of advanced 3-D seismic interpretation using state of the art software (including SMT, Geographix, etc.)
2. understand the principles of sequence stratigraphy and its use in the interpretation of seismic reservoir systems
3. understand the latest advanced concepts and models of seismic data processing
4. be able to identify basic depositional facies patterns in 3-D seismic data volumes
5. understand the uses of Ground-penetrating radar in delineating reservoir heterogeneity
6. understand the latest advanced techniques in geophysical well-log analysis
7. understand the application of gravity and magnetic surveying to the interpretation of seismic data
8. understand the principles and applications of down hole micro-resistivity imaging logs and dipmeter logs
9. understand the principles hydrofacturing technology and subsurface stress fields
10. understand the principles and use of magnetotelluric techniques
11. understand the use of biostratigraphy in the interpretation of 3-D seismic data volumes

Evaluation and Grade Assignment

Grades will be based on:

A) Performance in the class (50% of grade), i.e. how you understand the lecture and computer materials as gauged performance by quizzes and problem sets and discussions.
B) A research paper describing how one or more of the presented technologies could increase efficiency in the analysis of subsurface geology problems (20%)
C) Presentation of the results of a research project or a geophysical data interpretation project (30%)

Fees

A lab fee of $50.00 will be collected to cover costs of computer facility maintenance and printer and plotter supplies.

Class Policies

Attendance of all lectures is mandatory. While group discussion and collaboration is encouraged during the course, unless work is explicitly specified to be a team project, the work you hand in is expected to be yours.

Textbook

None required

Supplies

Notebook, pencils, scientific calculator

**Lecture Topics**

Depositional sequence stratigraphy
Seismic data analysis using Geographix software
Seismic data analysis using SMT software I
Seismic data analysis using SMT software II
Seismic data analysis using SMT software III
Advanced seismic data analysis techniques
Seismic data processing
Advanced well log analysis
Great successes and failures using subsurface geophysical data
Ground-penetrating radar techniques
Magnetotelluric techniques
Applications of gravity and magnetic surveying to subsurface interpretations
Applications of micropaleontology to seismic stratigraphy
An introduction to hydrofacturing technology and subsurface stress fields
Down hole micro-resistivity imaging logs and dipmeter logs
Course Number: GEOL 53xx  Instructor: James R. Garrison, Jr.

Credit Hours: 3  Semester: Spring  Year: 2009

Course Title: Clastic Biostratigraphy and Sequence Stratigraphy

1. **Course Description:**

   This graduate-level course is for coastal and marine systems science, and environmental science majors and professional geologists who would like a better understanding of the latest sequence stratigraphic techniques, principles, and clastic facies models available to geoscientists. The course will consist of an examination of the latest topics, techniques, and models in chronostratigraphy and sequence stratigraphy. There will be hands-on examination and analysis of data sets.

2. **Attach course outline or syllabus and a statement of course goals and objectives**

   See attached syllabus

3. **What group or groups of students is the course designed for?**

   Graduate-level students majoring in coastal and marine systems science and environmental science and professional geologists desiring advanced continuing education and graduate credit hours

4. **What is your best estimate of potential enrollment? What is the estimate based on?**

   Potential enrollment: ~10-20; based on current and anticipated enrollment numbers in geology, coastal and marine systems science, and environmental science and a polling of local professional geologists.

5. **What degree and/or teacher certification requirements will this course fulfill?**

   This course provides coastal and marine systems science and environmental science majors a better understanding of the latest sequence stratigraphic techniques, principles, and facies models available to geoscientists by providing a intensive lectures and literature analysis. This course fills a need for coastal and marine systems science and environmental science majors and professional geoscientists to have a better understanding of the latest stratigraphic techniques and principles available.

6. **Are present library and other university resources adequate to support this course?**
Yes.

7. **Comments:**

There has been multiple inquiries and requests for a course such as this from the local geoscience community, with the assurance that the 10-20 enrollment could be easily met as part of the continuing education commitment of local energy companies and consulting companies. This opportunity also serves to expose our graduate students to the latest innovations in biostratigraphy and sequence stratigraphy that will prepare them for future projects requiring such knowledge.
Course Description

This graduate-level course is for coastal and marine systems science and environmental science majors and professional geologists who would like a better understanding of the latest sequence stratigraphic techniques, principles, and clastic facies models available to geoscientists. The course will consist of an examination of the latest topics, techniques, and models in chronostratigraphy and sequence stratigraphy. There will be hands-on examination and analysis of data sets.

Prerequisites: Graduate standing, Sedimentation and Stratigraphy (or equivalent) and Invertebrate Paleontology, or permission of the instructor (with appropriate professional work experience).

Course Goals and Objectives

Upon completion of this course, the participant should:

1. understand the concepts of clastic depositional sequence stratigraphy and its applications to paleoenvironmental reconstructions
2. understand the principles of biostratigraphy and its use in the chronostratigraphy
3. understand clastic facies models
4. be able to identify clastic depositional facies patterns in 3-D seismic data volumes, well logs, cores, and outcrops
5. understand the role of facies models in developing sequence stratigraphic models
6. understand the role of trace fossils in making paleoecological interpretations in a sequence stratigraphic framework
7. be able to construct realistic paleogeographic maps
8. be able to construct realistic cross-sections

Evaluation and Grade Assignment

Grades will be based on:
A) Performance in the class (20% of grade), i.e. how you understand the lecture and computer materials as gauged by quizzes and problem sets and discussions.
B) A research paper describing how biostratigraphy and sequence stratigraphy could increase efficiency in the analysis of paleoenvironmental and paleoecologic problems (25%)
C) Presentation of the results of a research project or a geological data interpretation project (25%)
D) Final examination (30%)
Class Policies

Attendance of all lectures is mandatory. While group discussion and collaboration is encouraged during the course, unless work is explicitly specified to be a team project, the work you hand in is expected to be yours.

Textbooks

Sandstone Depositional Environments
Author: Scholle and Spearing (eds.)
Publisher: AAPG Memoir 31

Siliciclastic Sequence Stratigraphy in Well Logs, Cores, and Outcrops
Author: Van Wagoner, Mitchum, Campion, and Rahmanian
Publisher: AAPG Methods in Exploration Series, No. 7
ISBN: 0-89181-657-7

Sandstone Facies Models Response to Sea Level Change (Required)
Author: Walker and James (eds.)
Publisher: Geological Association of Canada
ISBN: 0-919216-49-8

Supplies

Notebook, pencils, scientific calculator, hand lens, and ruler

Lecture Topics

History of Stratigraphic Thought
Clastic Facies Models I – Fluvial Systems
Clastic Facies Models II – Delta Systems
Clastic Facies Models III – Shoreline Systems
Clastic Facies Models IV – Deep Water Systems
Principles of Biostratigraphy
Principles of Ichnology
Depositional Sequence Stratigraphy I
Depositional Sequence Stratigraphy II
Depositional Sequence Stratigraphy III
Seismic Sequence Stratigraphy
Principles of Paleoenvironmental Interpretation
Principles of Paleogeographic Reconstructions
Principles of Paleoecological Reconstructions
Developing Realistic Cross-sections