

	Course Syllabus (2015)
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Last Date Revised: August 2015

I. COURSE NUMBER AND TITLE: OCOR-5604-OD2 Marine Geology

Days: Online
 Building & Room: Online (Blackboard)

II. INSTRUCTOR:

Bernhard Riegl, PhD
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 Office: Schure, 1st Floor, #202
 Office Hours: Fridays, 10am-3pm.

III. COURSE DESCRIPTION:

Marine Geology reviews key concepts of marine geology, as needed by marine biologists to understand the geomorphic setting they are working in and to provide a general-knowledge background. Since it is graduate-level, students are required to enhance frontal classroom teaching by the instructor through research papers and their presentation on specialized subjects directly related to the taught material. Course material reviews planetary evolution, types of sediments and rocks, the reason for the existence of oceans and continents and the spatio-temporal dynamics of marine sedimentary and igneous processes. Numerous case-studies are used to illustrate concepts such as plate tectonics via island formation, and sedimentology via discussion of attractive sedimentary systems, such as coral reefs. Students will have a broad understanding of geological ocean dynamics and will be literate in present issues in the Earth Sciences.

Furthermore, since quantitative data analysis is a key skill required on the job-market, students will be introduced to the freeware statistical software R and will be exposed to the analysis of realistic geological datasets.

IV. COURSE LEARNING OUTCOMES*:

At the conclusion of this course the student will be:

At the conclusion of the course, students will have had an easy introduction to the relevant topics in today’s marine geology. Students will not have heard any specialist, or even very detailed, technical information. But students will be able to comprehend the broad issues, will be able to understand the use of mathematics and statistics to quantify a scientific

statement and will be able to use statistical software to express equations found in the instructional texts. Specialization can, if students choose this as their field of study, then occur in elective courses, Directed Independent Study, and the student's thesis work. At the conclusion of the course, students will be able to:

- Deliver a professional, formal presentation of an advanced topic in marine geology to a graduate audience
- Write a grammatically perfect, technically informed, well laid-out document on a chosen graduate topic in marine geology
- Use R for a limited exploration of standard, table-format, datasets
- Use R to explore equations as can be found in any scientific or instructional text
- Ask informed, in depth questions and elicit informed, in-depth answers from an interlocutor
- Answer such challenging questions as define above in a formal, scientific, and coherent manner
- Demonstrate detailed knowledge of the treated materials by answering questions that may not immediately have an obvious answer
- Demonstrate critical thinking ability by questioning or explaining complex processes with regards to marine geology
- Discuss and explain different rock types and their genesis
- Discuss and explain different land-forms and their genesis
- Discuss and explain the interaction of major Earth processes with climate and evolution
- Discuss and explain the major sedimentary processes in the oceans
- Discuss and explain the processes that lead to land being found in the ocean
- Discuss and explain why there are oceans, and what they are, and how they differ

These objectives* should show the following:

- The instructor is not interested in students just memorizing materials to forget after the exam
- The instructor wants students to be able to make connections and see consistencies/inconsistencies among theories and paradigms
- The instructor wants to expose students to the most powerful statistical software available
- The instructor wants to instill quantitative thinking skills
- Students are expected to increase their skills in formal presentation of complex contents. This is important in the job-market.
- Students must demonstrate advanced writing capability. Good writing demonstrates good thinking. If students can't write, they likely don't think straight. This is the single most important skill to learn in graduate school (and the hardest).
- Students are expected, at their own time, to further their understanding of data analysis, at least as shown in the instructional materials. This will have handsome pay-off at thesis time!
- Students are expected to be active – solicit materials, come to the lab and look at material! Students are the masters of their learning experience

*These are directly related to the Program Learning Outcomes for Marine Biology, Coastal Zone Management and Marine Environmental Science.

V. REQUIRED TEXTS AND MATERIALS:

None required. All materials are provided in accompanying Blackboard course.

VI. COURSE SCHEDULE AND TOPIC OUTLINE:

During the 2015 “Marine Geology” class, students will be required to attend classes online, complete two exams, present once and write one research paper. An ability to recreate analyses in R, at least to the level provided in the instructional materials, will be demonstrated through independent analyses of given data.

Class meetings:

Course is Online. No fixed schedule other than any announced in online forum. Class schedule can be found on page 3.

Requirements for graduation from the course are: successful passing of a midterm and a final exam, production (written) and presentation (oral) of a research paper, participation in all classes and the field experience.

Week	Dates (All Wed.)	Lecture Topics	Skill development
1	as convenient	Module 1. Factual and Quantitative: The Earth and R: an introduction	Academic understanding, installing R software, basic programming skills (data loading, for-loop, plotting data, check normality of data).
2	as convenient	Module 2. Factual: Basics of Plate Tectonics	Academic understanding, Application of R to develop quantitative argument (is correlation causation?).
3	as convenient	Module 3. Factual and Quantitative: The Make-up of Earth	Academic application of physics to geological principles, use R to explore and understand equations.
4	as convenient	Module 4. Factual: Island Chains/Oceanic Hotspots/Controversies surrounding hotspots	Deepen academic understanding of principles developed in Module 3.
5	as convenient	Module 5. Factual: Rocks formed in and on Earth’s crust	Deepen academic understanding and develop correct vocabulary w.r.t. rock types.
6	as convenient	MIDTERM	Demonstrate mastery of materials.
7	as announced	Module 6. Factual Shelf sedimentary processes:	Deepen academic understanding of principles developed in Module 5.
8	as convenient	Module 7. Quantitative Physics of sediment in water 101	Academic application of physics to geological principles, use R to explore and understand equations.
9	as convenient	Module 8. Factual Oceanic sedimentation and deep sea sediments/	Deepen academic understanding of principles dev Module 8.
10	as convenient	Module 9. Quantitative Analysis of a geological dataset	Use of R to perform data analysis of a geological dataset such as could be encountered during thesis work.

11	as convenient	Module 10. Factual Startigraphy	Academic understanding of principles.
12	as announced	EXAM	Demonstrate mastery of materials.

Note: This is a tentative schedule that may be changed. Students will be provided a minimum one week advance notice of any change when possible.

Traditionally, group projects have been assigned to manage work-load.

Quantitative Study Project:

- Students are assigned to a theme by random number draw. Students will be given their group, and assigned theme after discussion with the instructor. This will occur one or two weeks into the course. Within that theme, they are being presented by the instructor with a problem complex and pointers to a solution and have the duty to use these as a basis for further independent research.
- The goal is that students identify a problem that can be quantitatively expressed using R.
- Students will work on one question complex. The presented report (both to the same theme) will be graded.
- Students are to collaboratively produce:
 - Research report to be handed in to instructor
- Due dates for papers:
 - Technically, papers are due at the end of the semester. But the sooner students turn in their paper to their instructor, the more feedback they can get. The instructor allows students one draft that the instructor comments on. The next one is the student’s final version.
- Students also have access to all course materials online. All study materials exist on Blackboard as named folders (i.e. Folder “Study_Material_Sedimentology”, etc.). Students will find their corresponding folder (it corresponds to titles on p. 3 of this document) and begin working on it.
- Presentation and research paper amount to 30% of the final grade!

Note: If students want to change their presentation date (i.e. presentation group), they need to negotiate directly with a student assigned to their target date. Since the instructor assigned students by random number, your instructor will not interfere any further. So, if a student can’t change the date and doesn’t present, that student will get zero points.

The goal of the exercise:

- Students themselves will increase the quality of the course by helping the instructor find creative ways of applying the newly-learned skills. Instructor guides students by providing them with papers, code fragments, or pointers on what to do. These are by no means exhaustive and students are strongly advised to find more material.
 - Students will learn to write a coherent report. The production of the report is in content and length comparable to a thesis proposal and will thus confer important skills.

Length of research paper:

The research paper should be ~max. 8 pages with all figures

The research paper is to be handed in, ideally on the same day as the talk (unless something else is mutually agreed to). All group members must be identified as authors. The following will be evaluated:

- 1) Structure of paper
 - a. Introduction consisting of three paragraphs
 - b. Presentation of the tested hypothesis (if any)
 - c. Presentation of methods used
- 2) Quality of the presentation
 - a. Was new material sourced?
 - b. Are the graphics clear (avoid scans - whenever possible redigitize)?
 - c. Is the language clear and without errors (avoid colloquialisms)?
 - d. Is the formal presentation clear?
 - e. Is the scientific content correct?
 - f. Was the literature correctly interpreted?
 - g. Are citations used and referenced correctly?
 - h. Is plagiarism evident?

Students need to use their best and most formal English, no colloquialisms, as they will be graded on grammar and cleanliness of presentation as much as on content!

Online Discussions:

Active, thoughtful participation in online discussions is an important element of the course.

VII. GRADING CRITERIA

Grading Policy:

Since students should already be able to think critically, write coherently, and present perfectly, oral and written presentation will be 30% of final grade (see below). The other 70% will be made up by the student's demonstrated knowledge of the study materials.

Course Assignments and Grades:

Exams & Assignments	Points
Examination 1	35 points
Examination 2	35 points
Research Report Paper ("Term Paper")	15 points
Homeworks	15 points
TOTAL	100 points

What will be assessed in research talk and paper has been stated above. In the Appendix, find an example of an “A”-graded research paper.

VII. COURSE REQUIREMENTS AND POLICIES:

ATTENDANCE

As a requirement for accreditation, regular attendance is necessary. Students who miss class are responsible for the material. Each professor has the responsibility to enforce class attendance. To fulfill this requirement, students must have logged in, accessed, and/or interacted with the majority of online course requirements (e.g. assignment submissions, asynchronous discussion) by the first week of the session or they may be withdrawn from the course by the instructor through the Program Office. For this reason, if students anticipate or encounter any reason why they may be unable to engage with their online coursework for an extended period during a term, they must communicate this to their instructor and the Program Office as soon as possible. Students do have the option of requesting an Incomplete; if this is granted by their instructor, they then have 3-months from the end of the term date to submit the required course work as decided with the instructor. An incomplete grade agreement form must be completed and filed with the distance education office. An instructor reserves the right to request original written documentation to substantiate any such absences. A falsified excuse is cause for disciplinary action. An Incomplete course graded I must be completed in one semester or the grade is changed to F. All students are referred to the section

3.5.2. of the Oceanographic Center catalog (<http://nova.edu/ocean/forms/nsuoc-2014-2015-catalog.pdf>) for details on course withdrawals and refunds.

ACADEMIC HONESTY

In order to ensure the highest standards of academic honesty and ethical behavior, the NSU policies on cheating and plagiarism will be strictly enforced. See the NSU Student Handbook for more information at <http://www.nova.edu/cwis/studentaffairs/forms/ustudenthandbook.pdf>. I am empowered by the policy to penalize a student suspected of academic dishonesty, plagiarism, or otherwise misrepresenting work and I will do so and report that student to the Dean of the OC. Nova Southeastern University has contracted with **turnitin.com** to provide plagiarism detection services, and I will submit any suspicious documents to this service.

The use of cell phones, or any other electronic devices not specifically allowed by me, during an exam is not permitted. The use of such devices for any reason will be assumed to be for the purposes of cheating and will result in your dismissal from class and administrative action up to permanent expulsion from all NSUOC programs. If you need the phone for emergency notifications, or the like, leave the phone with me or the proctor at the start of class. You will be immediately notified if there is an incoming call.

EXPECTATIONS

You can expect that I will arrive on time for lectures and be well prepared. You can expect that I will be clear about my expectations and the criteria I use in assigning grades and that I will be fair and equitable. I will treat everyone in the class with consideration and respect.

I expect you to come to class, arrive on time, and be prepared for lecture and lab. I expect you to turn off your cell phones, pagers, and hand-held electronic devices as a gesture of reciprocal respect. If you bring a computer to class, I expect you to use it to take notes and record classroom information. I expect you to stay awake, take notes, participate in discussions and ask questions. I expect you to turn in your assignments on time and in good condition.

X: UNIVERSITY-WIDE POLICY STATEMENTS

A. Academic Misconduct: Academic misconduct appears in a variety of forms (including plagiarism). It is a violation of NSU academic policy and may be punished in a variety of ways, from failing the assignment and/or the entire course to academic probation, suspension or expulsion. If you have questions about what constitutes academic misconduct before handing in an assignment, see your instructor or the NSU Student Handbook at <http://www.nova.edu/cwis/studentaffairs/forms/ustudenthandbook.pdf>.

B. ADA Policy: Nova Southeastern University provides accommodations for students with documented disabilities. If you have a disability for which you believe you require accommodation, please contact Academic Services (<http://www.nova.edu/disabilityservices/>, 954-262-7189).

C. Last Day to Withdraw: Due to the compressed nature of this course you will be able to obtain a full refund of your tuition up to **Date Changes per TERM**. There will be no refund after that date. None of the lab fee is refundable; however you will own the airline ticket that was purchased for you. It is your responsibility to formally withdraw by completing the appropriate forms to obtain a refund (<http://www.nova.edu/ocean/coursepolicy.html>). A request for tuition refund must be made in writing at the time of withdrawal. Refunds will be made solely at the option of the university and will be based on the legitimacy of the reason for withdrawal. Should you fail to appropriately withdraw from this course, and then earn a grade below your expectations, I will do what I can to see that the grade is reported on your transcript. I will NOT backdate paperwork so that you can avoid earning a grade lower than you like.

D. Email Policy: All email communications between students and faculty must be conducted via NSU email accounts (<http://www.nova.edu/common-lib/policies/emailcomm.policy.html>). This requirement will assist NSU in communicating more effectively and protecting your privacy. Emails sent to faculty from non-NSU accounts will be returned to the sender with instructions to resend the communication from your NSU account. To set up an NSU email account or to get help with an existing account, go to https://www.nova.edu/sbin/account_request. Also, the computer help desk is available to assist you with questions regarding your NSU email account. It can be reached at 954-262-HELP (4357).

E. Student Course Evaluations: Student comment and feedback evaluating each college class is an important tool to evaluate program effectiveness. Participation in this process is a responsibility of each student.

F. Grading System

The following system is used to grade academic performance:

GRADE	DESCRIPTION
A	Excellent
B	Satisfactory
C	Marginal Pass
D	Poor
F	Failure
W	Withdrawal: Given after the third class week or termination by the instructor for non-completion of the course by the student.
I	Incomplete: Given when most (80 percent), but not all, work has been completed.
Au	Audit
P	Pass

Professors may use + or – in grading. **However, the grading scale ranges from A to D-, no A+ or F+ are awarded.** A grade of incomplete (I) must be requested from the instructor, have the Associate Dean’s approval, and be accompanied by a **completed contract specifying outstanding course requirements and completion dates.** Completion of the course graded incomplete must occur within one semester (or 3 months) of the end of the course and the incomplete be changed to a different grade. If the course is not completed in 3 months, or the student has not withdrawn and received a W, the incomplete will automatically be converted to a grade of F. Under unusual circumstances students may request a time-extension to complete the course. Such requests must be submitted to, and approved by, the Associate Dean of Academic Programs prior to the end of the 3-month time limit. **There are no exceptions to this rule. Securing the completed and signed incomplete contract forms is the responsibility of the student.**

Other Relevant Information:

How can students track their progress?

Students will receive immediate feedback after their talk. Students can hand in one draft paper (“draft” still means as perfect as possible. Your instructor will find things to correct!). The sooner students do that, the sooner they can get feedback. Students will see their exam grades within 3 days after taking them.

How to get started and where to find materials?

- ***Class is ever Wednesday at 6.30 at the Oceanographic Center.*** Be there!
- Course materials are found in Blackboard under folder “Course content”

What is the purpose of this course?

- It is a core course required for graduation at the OC
- The course will not make students a geologist, but it will provide the facts and insights required from any educated scientist

- Thus, it is a general, advanced course focusing on topics in geology relevant to marine science

What students need to comply with:

- Come to class and participate in discussions. This is for their own good, as materials discussed in class are not in the provided learning materials may be used in exams!
- Learn the materials provided online
- Give a presentation
- Write a 10-page term paper

Minimum technology requirements:

- Adequate access to the Internet to download learning materials

Prerequisite knowledge in discipline, any required competencies:

- Students should have had an undergraduate introduction to geology course, but students will be able to absorb all the materials even with no background at all
- All students need is to be attentive and read the materials
- Students should try to apply what they learn in the classroom in the field – on their own

Minimum required technical skills:

- Use of a computer to build a presentation, write a paper
- A firm grasp or grammatically perfect, scientific-style English (if students are uncertain what that should be, they need to check the provided examples and teaching material)
- Capability to use Powerpoint, Prezi, etc. for the student presentation

Appendix 1 (on next page): An example of an “A” graded paper:

This paper is by no means perfect, but the instructor liked it because:

- It is nicely formatted
- The chosen figures look good and complement the text well
- The text is informative and gives a good overview of the topic
- Citations occur throughout the text
- It does not repeat what was done in class or is in the teaching materials

There still are issues, but they are minor:

- Double-spacing is not preferred. 1.5 is enough and looks tidier
- The text could still be tightened
- Paper could have gone a bit more in-depth

Lessons for students:

- Students don't have to format in two columns, although we have to admit that it indeed looks nice

- Students will notice that there are no colloquialisms (“can’t”, “does’nt”, etc.)
- A full citation where the figures come from in the figure caption is not necessary. Students can do that, but can also simply say (from Author (2003)...and then cite that in the “References” section
- Students can format their references differently, but the format must be uniform throughout
- Students should notice how tidy the figures are. Students should avoid scans, or if they use scans, the scan must be perfect