



University of Puerto Rico
Mayagüez Campus
College of Arts and Sciences
Department of Geology

Course Syllabus and Instructor Information

1. General Information:

Alpha-numeric code: GEOL 4006

Course Title: Elementary Structural Geology

Section: 036

Meeting days and time: **Tuesday and Thursday, 9:30am - 10:20am**

Course Location: **Q-151**

Laboratory Sections:

86L—Tuesday,	2:30-4:20 PM,	F-303	TA: Desireé Bayouth
40L—Wednesday,	10:30AM-12:20PM,	F-303	TA: Desireé Bayouth
30L—Friday,	9:30-11:20 AM,	F-303	TA: Desireé Bayouth

2. Professor information: <https://sites.google.com/site/kstephenhughes/>

Name: Stephen Hughes

Office Hours: Tu/Th: 8:00am-9:30am

Office: F-414 (Geology Dept., Physics Bldg.)

W: 9:00am-12:00pm

Phone: (787) 832-4040 x2706

*Or by appointment

e-mail: kenneth.hughes@upr.edu

*Or anytime my office door is open

3. Course Description:

The study of major and minor rock structures. The general structure of the Earth, and deformation of its crust. Practical interpretation of geological maps.

4. Pre/Co-requisites and other requirements:

GEOL 3025

5. Course Objectives:

To introduce the fundamental concepts of structural geology. To inform with the basics of how structures are comprehended such that you will be able to undertake structural analysis for whatever purpose, be it either academic or applied.

6. Instructional Strategies:

Conference, Discussion, Lab Sessions, Field Trips

7. Requirements:

All students are expected to:

- (1) Attend each class.
- (2) Do all assigned readings (in the course outline on the next page).
- (3) Be prepared to participate in class by answering questions and quizzes.
- (4) Check your e-mail (@uprm.edu) for messages about the class.
- (5) **Enroll in the class web page on ecourses.uprm.edu. Enrollment Key: [geOL4006!](#)**
- (6) For the labs, you will need: calculator, pencils, colored pencils, ruler, protractor, tracing paper, and engineering/graph paper. Do not wait until it is too late to order or buy these items. **Buy them now.**

8. Tentative course outline

Week	Date	Session	Topic	Reading/Reference
1	Tu: 28 Jan Th: 30 Jan	1 2	Syllabus/Introduction Analysis and Scale	VdPM Ch. 1
2	Tu: 04 Feb Th: 06 Feb	3 4	Primary Structures Kinematic Analysis—An introduction	VdPM Ch. 2 VdPM p. 62-65
3	Tu: 11 Feb Th: 13 Feb	5 6	Strain Ellipse QUIZ 1 / Progressive Deformation	VdPM p. 65-67, 73 VdPM p. 68-70, 75-79, 87-89
4	Tu: 18 Feb Th: 20 Feb	7 8	Dynamic Analysis Mohr Circle—Stress	VdPM p. 40-46 VdPM p. 48-54
5	Tu: 25 Feb Th: 27 Feb	9 10	States of Stress / Natural Stresses Rheology	VdPM p. 54-60 VdPM Ch. 5
6	Tu: 03 Mar Th: 05 Mar	11 12	Rheology—Creep QUIZ 2 / Rheology—Natural Deform.	VdPM Ch. 5, p. 219-220 VdPM Ch. 5
7	Tu: 10 Mar Th: 12 Mar	13 14	Deformation Mechanisms and Microstructures Fractures—Joints and Veins	VdPM Ch. 9 VdPM p. 166-174
8	Tu: 17 Mar Th: 19 Mar	15	Class MID TERM EXAM Faults—Introduction	VdPM p. 166-168, 172-174, 176-179
9	Tu: 24 Mar Th: 26 Mar	16	Faults—continued <i>Monday Classes</i>	VdPM p. 179-182, 195-198
10	Tu: 31 Mar Th: 02 Apr	17 18	Fault Kinematics Fracture Dynamics	VdPM p. 169-172, 174-176, 182-184 VdPM p. 118-127
11	Tu: 07 Apr Th: 09 Apr		<i>Semana Santa</i> <i>Semana Santa</i>	
12	Tu: 14 Apr Th: 16 Apr	19 20	Anderson's Theory / Failure Envelope QUIZ 3	VdPM p. 127-131
13	Tu: 21 Apr Th: 23 Apr	21 22	Frictional Sliding Folds Introduction	VdPM p. 132-137, 191-195 VdPM p. 238-245
14	Tu: 28 Apr Th: 30 Apr	23 24	Folds Geometry Fabric Introduction, Foliation/Lineation	VdPM p. 245-257 VdPM p. 270-288, 288-293
FIELD TRIP SATURDAY MAY 2				
15	Tu: 05 May Th: 07 May	25 26	Shear Zones / Strain Fabrics TBA	VdPM p. 294-304, 311-315, 284-285, 304-306
16	Tu: 12 May Th: 14 May	27	QUIZ 4 Lab FINAL EXAM, no lecture (4:00pm – 6:30pm)	
	17-24 May		Class Final Exam To Be Announced	

9. Grading System

Quantifiable (letters)

Standard Curve:	100 – 90	A
	89 – 80	B
	79 – 65	C
	64 – 55	D
	54 –	F

10. Evaluation Strategies

<u>Grades</u>	<u>Points</u>
Class Mid term exam	100
Class Final exam	100
Course Quizzes (4 quizzes @ 25 points each)	100
Lab Assignments (11 labs @ 15 points each)	165
Lab Midterm exam	50
Lab Final Exam	50

Total Points Possible (*No extra credit*) **565**

**Class exams will be given only during class hours. Exams will be in English.*

**There will be no make-up quizzes or exams.*

All lab assignments are due at the **BEGINNING of the next lab session (so Lab 1 is due at the beginning of Lab 2). If a lab is turned in late, you will receive a penalty of 1.5 points off per day late. If you do not turn in the lab before the TA returns the graded labs, you will receive a zero for that lab assignment. There are no exceptions to this rule.*

Collaboration: You are welcome to discuss the lab problems with your classmates, however, each student should submit their own work to be graded. Instances of cheating will result in a zero for **BOTH or **ALL** students involved. Don't do it.*

11. Tentative Examination schedule:

Lab Midterm Exam	Thursday, 26-March
Class Midterm Exam	Tuesday, 17-March
Lab Final Exam	Thursday, 14-May
Class Final Exam	To be announced

12. Bibliography

Required text: Van der Pluijm, B., and Marshak, S., 2004, **Earth Structure: An Introduction to Structural Geology and Tectonics, 2nd Edition**, W.W. Norton & Co. (VdPM)

Required Lab Book: Rowland, S., Duebendorfer, E., and Scheifelbein, I., 2007, **Structural Analysis and Synthesis: A Laboratory Course in Structural Geology, 3rd Edition**, Blackwell Scientific. (RDS) **It is important that you buy a NEW version of the lab book because we will be using materials that are provided within it for some of the labs.**

Class notes: Lectures will be given in English and will not be distributed - you need to come to class to see/hear them.

13. Regulations and Policies:

- **Class attendance** is compulsory. The University of Puerto Rico, Mayagüez Campus, reserves the right to deal at any time with individual cases of non-attendance. Professors are expected to record the absences of their students. Frequent absences affect the final grade, and may even result in total loss of credits. Arranging to make up work missed because of legitimate class absence is the responsibility of the student (Bulletin of Information Undergraduate Studies).

- **Absence from examinations:** Students are required to attend all examinations. If a student is absent from an examination for a justifiable reason acceptable to the professor, he or she will be given a special examination. Otherwise, he or she will receive a grade of zero or "F" in the examination missed (Bulletin of Information Undergraduate Studies).

- **Excuses from class or examinations:** ONLY WRITTEN EXCUSES WILL BE ACCEPTED. If a student is absent from an examination, he/she will have the opportunity to take a make-up test NO LATER than 5 days after the group took the exam. Make-up exams will only be given by appointment if the student has an excuse deemed legitimate by the instructor.

- **Policies on electronic devices:** Radios, tape recorders, and other audio or video equipment are not permitted in the classroom at any time. No cell phones are allowed to be used during class.

- **Cheating:** Cheating will be dealt with harshly. *All instances of cheating on examinations will be immediately reported to the Dean of Arts and Sciences for review.* There will be no exceptions to this policy.

- **Advice from the professor:** Do not miss class. You need to buy the books. You need to read the books. You need to ask questions, talk to your classmates, talk to me. This class is difficult especially if it is your first class after intro geology. If you are having trouble, come to my office hours. I am nice.

14. According to Law 51

Students will identify themselves with the Institution and the instructor of the course for purposes of assessment (exams) accommodations. For more information please call the Student with Disabilities Office, which is part of the Dean of Students office (Chemistry Building, room 019) at (787)265-3862 or (787)832-4040 extensions 3250 or 3258.

Law 51: The Comprehensive Educational Services Act for People with disabilities states that after identifying with the instructor and the institution, the student with disabilities will receive reasonable accommodation in their courses and evaluations. For more information contact the Department of Counseling and Psychological services at the Office of the Dean of Students (Office DE 21) or call 787-265-3864 or 787-832-4040 x 3772, 2040 and 3864.

Sexual Harassment: Certification 130-2014-2015 states:

Sexual harassment in the workplace and in the study environment is an illegal and discriminatory act and is against the best interests of the University of Puerto Rico. All persons who understand they have been subject to acts of sexual harassment at the University of Puerto Rico may file a complaint and request that the institution investigate, where necessary, and assume the corresponding action by the university authorities. If the complainant is a student, he or she must refer his or her complaint to the Office of the Student Ombudsperson or that of the Dean of Students.

Certification 06-43 of the Academic Senate states, "The academic guidelines for offering online courses," defines:

Traditional face-to-face courses are those that have less than 25% of the course's regular contact hours via the Internet. Therefore, a three-credit course will be considered "face to face" if, of the 45 hours of regular contact, 11 or less are taught via the Internet.

The following should be included in all syllabi:

According to certification 16-43 of the Academic Senate, a course may include up to 25% of its total contact hours via the Internet.

The objective of this is so that all professors have this alternative in the case of any unscheduled eventuality.

Every student should be prepared to attend a virtual class session via internet if the campus is not accessible for any reason.

15. Lab Schedule:

Week	86L	40L	30L	Topic	Reading
1	Tu. Jan. 28 Lab 1	W. Jan. 29 Lab 1	F. Jan. 31 Lab 1	Lab 1 = Fundamental Concepts and Techniques	RDS Ch. 1
2	Tu. Feb. 04 Lab 2	W. Feb. 05 Lab 2	F. Feb. 07 Lab 2	Lab 2 = Outcrop pattern, structure contours, etc.	RDS Ch. 2
3	Tu. Feb. 11 Lab 3	W. Feb. 12 Lab 3	F. Feb. 14 ♥ Lab 3	Lab 3 = Strain Analysis	RDS Ch. 14
4	<i>Tu. Feb. 18 No Lab</i>	<i>W. Feb. 19 Monday Classes</i>	F. Feb. 21 Lab 4	Lab 4 = Stress	handout
5	Tu. Feb. 25 Lab 4	W. Feb. 26 Lab 4	F. Feb. 28 Lab 5	Lab 5 = Geologic Maps	RDS Ch. 3
6	Tu. Mar. 03 Lab 5	W. Mar. 04 Lab 5	F. Mar. 06 Lab 6	Lab 6 = Geologic Structure Sections	RDS Ch. 4
7	Tu. Mar. 10 Lab 6	W. Mar. 11 Lab 6	F. Mar. 13 Lab 7	Lab 7 = Stereographic Projection	RDS Ch. 5
8	Tu. Mar. 17 Lab 7	W. Mar. 18 Lab 7	F. Mar. 20 Lab 8	Lab 8 = Brittle Faults	RDS Ch. 9,10,13
9	Th. Mar. 26 : 4:00-6:30pm Lab MIDTERM			Labs 1-6	
10	Tu. Mar. 31 Lab 8	W. Apr. 01 Lab 8	F. Apr. 03 Lab 9	Lab 9 = Introduction to fold	RDS Ch. 6
11	<i>Tu. Apr. 07 Semana Santa</i>	<i>W. Apr. 08 Semana Santa</i>	<i>F. Apr. 10 Semana Santa</i>		
12	Tu. Apr. 14 Lab 9	W. Apr. 15 Lab 9	F. Apr. 17 Lab 10	Lab 10 = Analysis of folded regions	RDS Ch. 7,8
13	Tu. Apr. 21 Lab 10	W. Apr. 22 Lab 10	F. Apr. 24 Lab 11	Lab 11 = Rock Fabrics	RDS Ch. 16
14	Tu. Apr. 28 Lab 11	W. Apr. 29 Lab 11	<i>F. May 01 No Lab</i>		
15	<i>Tu. May 05 No Lab</i>	<i>W. May 06 No Lab</i>	<i>F. May 08 No Lab</i>		
	Th. May 14: 4:00 – 6:30pm Lab FINAL EXAM			Labs 7-11	
				Lab 12 = BONUS! Plate Tectonics *All Lab 12 due at <u>Class</u> Final Exam	RDS Ch. 17

** Any information in this syllabus is subject to change.**