

Course Syllabus

Course Information

GEOS 4320 Physics and Chemistry of the Solid Earth
John Ferguson
TA Li Ren
Fall 2016
Mon and Wed 10:00 to 11:15 AM
ROC 2.103

Professor Contact Information

Office Phone	(972) 883-2410
Office Location	ROC 2.301E and ROC 1.523
E-mail Address	ferguson@utdallas.edu
Office Hours	Tue 1:00 to 3:00 PM (make appointment by e-mail)

TA Contact Information

Office Location	ROC 1.502
E-mail Address	lxr140430@utdallas.edu
Office Hours	Mon and Tue 11:20 AM to 12:20 PM

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Students will have satisfied the Geosciences BS degree physics and chemistry requirements

Course Description

The study of the structure and evolution of the Earth through petrology, geochemistry and geophysics. Plate tectonics will be emphasized as a framework for crust and mantle dynamics. The roles of gravity, thermal processes and the mechanical behavior of rocks are investigated. Tectonic settings of igneous and metamorphic rocks will be explored.

Student Learning Objectives/Outcomes

Demonstrate basic knowledge and understanding in key, core areas of the geosciences, including mineralogy, petrology, sedimentology, geospatial systems, and structural geology and to apply this knowledge and understanding to enhance basic problem solving skills.

Demonstrate basic proficiency in the application of experimental and/or computational methods to address questions in the general geosciences

Demonstrate basic proficiency in the written and oral presentation of scientific findings.

Required Textbooks and Materials

Fowler, "The Solid Earth" (2005), Cambridge U. Press.

Suggested Course Materials

Rodgers, "An Introduction to Our Dynamic Planet" (2008), Cambridge U. Press

Assignments & Academic Calendar

Readings from the textbook are labeled "TSE Ch. X" in the schedule.

August	22 M	Introduction - basic physics and chemistry, units
	24 W	Earth and Other Planets
	29 M	Geochronology (TSE Ch. 6)
	31 W	Origin of the Earth
September	5 M	NO CLASS - Labor Day
	7 W	Gravity and Geodesy (TSE Ch. 5)
	12 M	Gravity and Geodesy (TSE Ch. 5)
	14 W	Magnetism and the Geodynamo (TSE Ch. 3)
	19 M	Magnetism (TSE Ch 3)
	21 W	Paleomagnetism (TSE Ch 3)
	26 M	Rheology, Rock Mechanics and Rock Physics
	28 W	Rheology, Rock Mechanics and Rock Physics
October	3 M	Heat and Thermal Structure (TSE Ch. 7)
	5 W	Heat and Thermal Structure (TSE Ch. 7)
	10 M	Seismology (TSE Ch. 4)
	12 W	Seismology (TSE Ch. 4)
	17 M	NO CLASS - SEG Meeting
	19 W	NO CLASS - SEG Meeting
	24 M	Seismology (TSE Ch. 4)
	26 W	Earthquakes (TSE Ch. 4)
November	31 M	Gravity, Flexure and Tectonics (TSE Ch. 5)
	2 W	Plate Tectonics - Subduction Zones [PAPER: Stern 2002; Rev. Geophysics]
	7 M	Plate Tectonics - Subduction Zones [PAPER: Stern 2002; Rev. Geophysics]
	9 W	Plate Tectonics – Rifts and Transform Faults (TSE Ch. 2, 10)
	14 M	Oceanic Crust (TSE Ch.9)
	16 W	Continental Crust (TSE Ch.10)

	21 M	NO CLASS - Fall Break
	23 W	NO CLASS - Fall Break
	28 M	Exploration and Engineering Geophysics
	30 W	Presentations
December	5 M	Presentations
	7 W	Presentations

Grading Policy

60% problem sets

5% term project outline (due Oct 12)

Term project, 20% Power Point and 10% classroom presentation

5% . classroom participation and attendance

5% extra credit for attending departmental seminars (Sign-up sheet at each talk)

Course & Instructor Policies

Students are expected to attend all lectures. Absences due to illness and professional travel are excused. All work should be turned in on or before assigned due dates

Off-campus Instruction and Course Activities

None

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

“As a Comet, I pledge honesty, integrity, and service in all that I do.”

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus.

Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.