Course Syllabus

Course Information

GEOS 4320 Physics of the Solid Earth
Instructor: Hejun Zhu
TA: Shuo Zhang
Fall 2018
Mon and Wed 10:00 to 11:15 AM
ROC 2.103

Professor Contact Information

Dr. Hejun Zhu

Office Phone	(972) 883-2810
Office Location	ROC 2.301J
E-mail Address	hejun.zhu@utdallas.edu
Office Hours	Wed 3:00 to 4:00 pm (make appointment by e-mail)

TA Contact Information

Office Location	ROC 1.502
E-mail Address	Shuo.Zhang@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

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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.

Assignments & Academic Calendar

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

August	20 M	Introduction - basic math, units and constants
	22 W	Plate tectonics 1 (TSE Ch. 2)
	27 M	Plate tectonics 2 (TSE Ch.2)
	29 W	Stress and strain
September	3 M	No CLASS- Labor Day
	5 W	Elasticity
	10 M	Lithosphere flexure (TSE Ch.5)
	12 W	Gravity anomalies (TSE Ch. 5)
	17 M	Isostasy and geoid (TSE Ch. 5)
	19 W	Heat conduction (TSE Ch. 7)
	24 M	Oceanic heat flow and mantle adiabatic (TSE Ch.7)
	26 W	Heat convection (TSE Ch.7)
October	1 M	Magnetics and Geodynamo (TSE Ch.3)
	3 W	Magnetics (TSE Ch.3)
	8 M	Paleomagnetics (TSE Ch.3)
	10 W	Introduction to seismology (TSE Ch. 4)
	15 M	Refraction seismology (TSE Ch.4)
	17 W	Reflection seismology (TSE Ch.4)
	22 M	Earthquake (TSE Ch.4)
	24 W	Deep Earth structure (TSE Ch.4)
	29 M	Fluid mechanics 1
	31 W	Fluid mechanics 2
November	5 M	Rheology, Rock mechanics and Rock Physics
	7 W	Rheology, Rock Mechanics and Rock Physics
	12 M	Subduction Zones
	14 W	Rifts and Transform Faults (TSE Ch. 2, 10)
	19 M	NO CLASS – FALL BREAK
	21 W	NO CLASS – FALL BREAK
	26 M	Oceanic Crust and Lithosphere (TSE Ch.9)
	28 W	Continental Crust and Lithosphere (TSE Ch.10)

December	3 M	Presentations
	5 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

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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.