

GRANDE PRAIRIE REGIONAL COLLEGE  
DEPARTMENT OF SCIENCE AND TECHNOLOGY

FALL SEMESTER 2000-2001

COURSE OUTLINE

EARTH SCIENCE 1010  
*INTRODUCTION TO EARTH SCIENCE*

Lecture	Section A2	TR 8:30-9:50	Room J226
Lecture	Section B2	MW 10:00-11:20	Room J226
Lab	L1, L2, L3, L4	MTWR 14:30-17:20	Room J107

INSTRUCTOR: Dr. Rob Young, J215, 539-2981, ryoung@gprc.ab.ca

TRANSFER CREDIT:	U. of Alberta	EAS 101	3 Credits
	U. of Calgary	GLGY 201	3 Credits
	U. of Lethbridge	GEOL 2060	3 Credits
	Athabasca Univ.	GEOL 200	6 Credits

**OBJECTIVE** The course has been designed to generate competence in the fundamental concepts of Earth Sciences through the media of lecture, visual aids, and integrated laboratory exercises. ES 1010 serves both as the introductory course for specialists in Geology or Physical Geography, and as a course for non-specialists desiring knowledge of the Physical Earth.

**COURSE OUTLINE** Planet Earth, minerals, rocks and rock types, plate tectonics, volcanoes, earthquakes and Earth's interior, weathering and erosion, geologic time scale, folds, faults, mass wasting, hydrologic cycle, rivers, glaciers, wind and deserts.

Identification of minerals, rocks (igneous, sedimentary and metamorphic). Use of topographic maps, cross-sections, geologic maps and structures, glaciers, and rivers.

**TEXTBOOKS** Understanding Earth by Press and Siever (3<sup>rd</sup> ed.)

**LAB BOOK** Lab exercises for Earth Science

**OTHER ITEMS**

1. Simon and Schester's Guide to Rocks and Minerals or equivalent
2. Dictionary of Geological Terms

The following approximate schedule of lecture topics is presented as an aid to your study outline.

<b>Week of:</b>	<b>Topics</b>
Sept. 4	Introduction and course outline. The Scientific Method. Origin of the Earth (Ch. 1)
Sept. 11	Introduction to: plate tectonics, and Earth structure and composition. Atomic structure and physical properties of minerals. (Ch. 2)
Sept. 18	Classification of rocks, rock cycles. Igneous rocks, origin and classification of rocks, relation to plate tectonics. (Ch. 3 and 4)
Sept. 25	Vulcanology, volcanic processes and landforms, Sedimentary rocks and classification (clastic and chemical), lithification processes. (Ch. 5 and 7)
Oct. 2	Metamorphic rocks (classification, metamorphic facies, relation to plate tectonics). (Ch. 8)
Oct. 9	Structural geology and rock deformation (folds, faults, plate tectonic setting). Geologic time (absolute vs. relative), principles of stratigraphy. (Ch. 9 and 10)
Oct. 16	Earthquakes (elastic rebound theory, Richter scale, causes of earthquakes, epicenter). Earth's interior, Earth's magnetism and paleomagnetism. (Ch. 18 and 19)
Oct. 23	The hydrologic cycle. Weathering, limestone karst systems, processes, and caves. (Ch. 6, 12)
Oct. 30	Mass movement and landforms. (Ch. 11)
Nov. 6	River processes in drainage basins. Four basic river types. River landforms and sediments. (Ch. 13)
Nov. 13	Glacial processes. Glaciers in mountains and continental glaciers. Glacial landforms, sediments. (Ch. 15 plus additional reading)
Nov. 20	Glacial studies continued. Periglacial environments (permafrost, active layer). Landforms and sediments. (Ch. 15)
Dec. 27	Wind processes and landforms. Desert processes and landforms. Landscape evolution (Ch. 14, 16)
Dec. 4	Marine development of beach and rock coast landforms. Submarine erosion and sedimentation. Eustatic and isostatic sea-level variation. (Ch. 17)

**Last day of classes – December 8, 2000.**

**ASSIGNMENTS:** You will be given weekly assignments consisting of multiple choice, true/false, or fill in the blank type questions. These assignments are open book, and some midterm and final exam questions will be based on these assignments. They are due one week from the day they are handed out. Late = 0.

**MARKS DISTRIBUTION:**

Assignments	20%
Lab midterm	15%
Midterm exam	20%
Lab final	15%
Final exam	30%
Total	<u>100%</u>

<b>Week of:</b>	<b>Lab Topics</b>
Sept. 4	No lab
Sept. 11	No lab
Sept. 18	Lab 1: Mineral identification
Sept. 25	Lab 2: Igneous rocks
Oct. 2	Lab 3: Sedimentary rocks
Oct. 9	Lab 4: Metamorphic rocks
Oct. 16	Midterm Lab Exam
Oct. 23	No lab
Oct. 30	Lab 5: Topographic maps
Nov. 6	Lab 6: Topographic maps and cross sections
Nov. 13	No Lab
Nov. 20	Lab 7: Geological maps and structure sections
Nov. 27	Lab 8: Glaciation
Dec. 4	Lab Final Exam