

**GRANDE PRAIRIE REGIONAL COLLEGE**  
DEPARTMENT OF SCIENCE and TECHNOLOGY

FALL SEMESTER 1999-2000

**COURSE OUTLINE**

SEP 05 2000

**EARTH SCIENCE 1010**  
*An Introduction to Earth & Atmosphere*

Lecture	Section A2	T R	11:30 - 12:50	Room J228
Lecture	Section T2	M W	8:30 - 9:50	Room E306A
Lab	L1,L3,L2	TWR	14:30 - 17:20	Room J107

**INSTRUCTOR:** Dr. Desh Mitra

**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 and Atmospheric 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 Geography and as a course for non-specialists desirous of obtaining knowledge of the Earth and Atmosphere.

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

Identification of: - minerals, sedimentary rocks, igneous rocks and metamorphic rocks. Topographic maps, cross-sections, geologic maps and structures, rivers and glaciers.

**TEXTBOOKS** Understanding Earth, by F. Press and R. Siever

**LAB BOOK** Lab exercises for Earth Science

**OTHER ITEMS**

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

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

Week of Jan. 3	Introduction & Course Outline Slide show. Origins of Earth (Ch. 1)
Week of Jan. 10	Introduction to plate tectonics, earth structure and composition. Atomic structure of matter, crystals, minerals and physical properties of minerals. (Ch. 2)
Week of Jan. 17	Classification of rocks, rock cycles. Igneous rocks; classification origin plate tectonic content and distribution. (Ch. 3 & 4)
Week of Jan. 24	Volcanology, volcanic processes and land forms. Sedimentary rocks; classification, clastic versus chemical, lithification processes. (Ch.5 & 7)
Week of Jan. 31	Metamorphic rocks; classification, metamorphic facies, relation to plate tectonic setting, mineral and energy resources. (Ch. 8 & 23)
Week of Feb. 7	Structural geology and rock deformation; folds, faults, plate tectonic setting. Geologic time; absolute versus relative, principles of stratigraphy and relative age dating. (Ch. 9 & 10)
Week of Feb. 14 (Mid-Terms)	Earthquakes; elastic rebound theory, Richter scale, causes of earthquakes, epicentre. Earth's interior; seismic evidence, cosmo-chemical constrains, Earth's magnetism and paleo-magnetism. (Ch. 18 & 19)
Week of Feb. 28	The hydrologic cycle. Weathering, mass movement slope processes and landforms. (Ch. 6, 11, & 12)
Week of Mar. 6	River processes in drainage basins. Development of channels, bars, flood plains, landform and sediments. (Ch. 13)
Week of Mar. 13	Continental ice sheets and alpine glaciers; thermal regimes, geomorphic processes, landforms and sediments. (Ch. 15)

Week of Mar. 20	Periglacial environments; permafrost, active layer cold-zone geomorphic processes, landforms and sediments. (Ch. 16)
Week of Mar. 27	Marine development of beach and rock coast landforms. Submarine erosion and sedimentation. Eustatic and Isostatic sea level variation. (Ch. 17)
Week of Apr. 3	Geomorphic processes, landforms, and sediments in desert. Eolian (wind-formed) landforms and sediments. (Ch. 14)
Week of Apr. 10	Lime stone karst system; processes, surface forms and caves. (Ch. 12)
<b>Last day of classes – April 12, 2000</b>	

**ASSIGNMENTS**

You will be given weekly assignments consisting of multiple choice, true/false-type questions. These assignments are open book and test and exam questions will be based on these assignments.

Minitest

Every second week, you will be given a minitest at the start of class which will be approximately 20 minutes long. Labs will also have quizzes.

**MARKS DISTRIBUTION**

Minitests	10%
Assignments	10%
Lab quiz	10%
Weekly labs	10%
Midterm exam	15%
Lab final	15%
Final exam	<u>30%</u>
	100%

## LAB SCHEDULE

Week of:

January 10	Introduction and Mineral Identification
January 17	Lab 1 Mineral identification
January 24	Lab 2 Igneous rocks
January 31	Lab 3 Sedimentary rocks
February 7	Lab 4 Metamorphic rocks
February 14	MID TERM LAB EXAM (open book)
February 28	Lab 5 Topographic maps
March 6	Lab 6 Topographic maps and cross section
March 13	Lab 7 Geological maps and structure section
March 20	Lab 8 Glaciation
March 27	Review labs 5 to 8
April 3	LAB FINAL EXAM (closed book)

**Note** - labs could be used for studying rocks, minerals or maps other than scheduled lab hours by pre-arranging with Medha Karnik, our lab technologist.