

GRANDE PRAIRIE REGIONAL COLLEGE  
DEPARTMENT OF SCIENCE  
COURSE OUTLINE 1997-98

EARTH SCIENCE 1010

*Introduction Earth And Atmosphere*

Lecture	Section A2	M W F	12:00 - 12:50
	Section B2	T R	9:30 - 10:50
Lab	Section L1	M	3:00 - 5:50
	Section L2	T	3:00 - 5:50
	Section L3	W	3:00 - 5:50

**INSTRUCTOR:** Dr. Desh Mittra

**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

**COURSE OBJECTIVES** 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 and different types of rocks, plate tectonics and 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

**Note - All books and materials are available at the College Bookstore**

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

Week of Sept. 2	Introduction & Course Outline Slide show. Origins of Earth (Ch. 1)
Week of Sept. 8	Introduction to plate tectonics, earth structure and composition. Atomic structure of matter, crystals, minerals and physical properties of minerals. (Ch. 2)
Week of Sept. 15	Classification of rocks, rock cycles. Igneous rocks; classification origin plate tectonic content and distribution. (Ch. 3 & 4)
Week of Sept. 22	Volcanology, volcanic processes and land forms. Sedimentary rocks; classification, clastic versus chemical, lithification processes. (Ch.5 & 7)
Week of Sept. 29	Metamorphic rocks; classification, metamorphic facies, relation to plate tectonic setting, mineral and energy resources. (Ch. 8 & 23)
Week of Oct. 6	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 Oct. 13 (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 Oct. 20	The hydrologic cycle. Weathering, mass movement slope processes and landforms. (Ch. 6, 11, & 12)
Week of Oct. 27	River processes in drainage basins. Development of channels, bars, flood plains, landform and sediments. (Ch. 13)
Week of Nov. 3	Continental ice sheets and alpine glaciers; thermal regimes, geomorphic processes, landforms and sediments. (Ch. 15)

Week of Nov. 10	Periglacial environments; permafrost, active layer cold-zone geomorphic processes, landforms and sediments. (Ch. 16)
Week of Nov. 17	Marine development of beach and rock coast landforms. Submarine erosion and sedimentation. Eustatic and Isostatic sea level variation. (Ch. 17)
Week of Nov. 24	Geomorphic processes, landforms, and sediments in desert. Eolian (wind-formed) landforms and sediments. (Ch. 14)
Week of Dec. 1	Lime stone karst system; processes, surface forms and caves. (Ch. 12)

**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 Sept. 8	Mineral identification
Week of Sept. 15	Mineral identification
Week of Sept. 22	Igneous rocks
Week of Sept. 29	Sedimentary rocks
Week of Oct. 6	Metamorphic rocks
Week of Oct. 13	No labs
Week of Oct. 20	Topographic maps
Week of Oct. 27	Topographic maps and cross section
Week of Nov. 3	Geologic maps and structure section
Week of Nov. 10	Rivers*
Week of Nov. 17	Glaciers
Week of Nov. 24	Lab Final Exam

\*Because of the Remembrance Day holiday on November 11, Tuesday labs will be adjusted with other sections on Monday and Wednesday.

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.