

GRANDE PRAIRIE REGIONAL COLLEGE
DEPARTMENT OF SCIENCE and TECHNOLOGY

FALL SEMESTER 2002 - 2003

SEP. 10 2002

COURSE OUTLINE

EARTH SCIENCE 1010
An Introduction to Earth & Atmosphere

Lecture	Section A2	M W	10:00 - 11:20	Room J226
Lecture	Section T2	M W	14:30 - 15:50	Room E306A
Labs	L1,L2,L3	RFW	14:30 - 17:20	Room J107

INSTRUCTOR: **Dr. Desh Mittra**

<u>TRANSFER CREDIT:</u>	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 Sept. 2	Introduction & Course Outline Slide show. Origins of Earth (Ch. 1)
Week of Sept. 9	Introduction to plate tectonics, earth structure and composition. Atomic structure and physical properties of minerals. (Ch. 2)
Week of Sept. 16	Classification of rocks, rock cycles. Igneous rocks, origin and classification of rocks, plate tectonic content and distribution.(Ch. 3 & 4)
Week of Sept. 23	Volcanology, volcanic processes and land forms. Sedimentary rocks and their classification, clastic versus chemical, lithification processes. (Ch.5 & 7)
Week of Sept. 30	Metamorphic rocks; classification, metamorphic facies, relation to plate tectonics, mineral and energy resources. (Ch. 8 & 23)
Week of Oct. 7	Structural geology and rock deformation; folds, faults, plate tectonic setting. Geologic time; absolute versus relative, principles of stratigraphy and relative-age dating. (Mid Terms) (Ch. 9 & 10)
Week of Oct. 14	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. 21	The hydrologic cycle. Weathering, mass movement slope processes and landforms. (Ch. 6, 11, & 12)
Week of Oct. 28	Lime stone karst system; processes, surface forms and caves. (Ch. 12)
Week of Nov. 4	River processes in drainage basins. Development of channels, bars, flood plains, landform and sediments. (Ch. 13)
Week of Nov. 11	Continental ice sheets and alpine glaciers; thermal regimes, geomorphic processes, landforms and sediments. (Ch. 15)
Week of Nov. 18	Periglacial environments; permafrost, active layer cold-zone geomorphic processes, landforms and sediments. (Ch. 16)

Week of Nov. 25	Marine development of beach and rock coast landforms. Submarine erosion and sedimentation. Eustatic and Isostatic sea-level variation,(Ch. 17)
Week of Dec. 2	Geomorphic processes, landforms, and sediments in desert. Eolian (wind-formed) landforms and sediments. (Ch. 14)
Last day of classes - December 6, 2002	

ASSIGNMENTS

You will be given weekly assignments consisting of multiple choice, true/false or fill in the blanks type questions. These assignments are open book and are available on WebCT. You will be given two choices and marks will be recorded out of the best. The test will be available for two weeks before the due date. If you do not complete your test within given time, a **20% deduction per day** will be applied to your score.

Minitest

Every second week, you may be given a mini-test at the start of class which will be approximately 15 minutes long. Labs will also have quizzes.

MARKS DISTRIBUTION

Minitests	5%
Assignments	15%
Lab quiz	10%
Weekly labs	10%
Midterm exam	15%
Lab final	15% (Two finals 7.5% each)
Final exam	<u>30%</u>
	100%

LAB SCHEDULE

Week of:

September 2	Introduction and Mineral Identification techniques
September 9	Lab 1. Mineral identification
September 16	Lab 2. Igneous rocks
September 23	Lab 3. Sedimentary rocks
September 30	Lab 4. Metamorphic rocks
October 7	Review Lab - Minerals and rocks
October 14	FINAL LAB EXAM (PART 1)- open book
October 21	Topographic maps
October 28	Topographic maps and cross section
November 4	Geological maps and structure section
November 11	Glaciation
November 18	Review Lab
November 25	FINAL LAB EXAM (PART 2) - closed book

Note - All books and materials are available at the College Bookstore
- labs could be used for studying rocks, minerals or maps other than scheduled lab hours by pre-arranging with Medha Karnik, our lab technologist.