GRANDE PRAIRIE REGIONAL COLLEGE

DEPARTMENT OF SCIENCE and TECHNOLOGY

FALL SEMESTER 2003 - 2004

COURSE OUTLINE

EARTH SCIENCE 1010

An Introduction to Earth & Atmosphere

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

INSTRUCTOR: **Dr. Desh Mittra** **Office J215** **Ph. 539 2981**

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

OBJECTVE 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. 1	Introduction & Course Outline Slide show. Origins of Earth (Ch. 1)
Week of Sept. 8	Introduction to plate tectonics, earth structure and composition. Atomic structure and physical properties of minerals. (Ch. 2)
Week of Sept. 15	Classification of rocks, rock cycles. Igneous rocks, origin and classification of rocks, plate tectonic content and distribution.(Ch. 3 & 4)
Week of Sept. 22	Volcanology, volcanic processes and land forms. Sedimentary rocks and their classification, clastic versus chemical, lithification processes. (Ch.5 & 7)
Week of Sept. 29	Metamorphic rocks; classification, metamorphic facies, relation to plate tectonics, 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. **(Mid Terms)** (Ch. 9 & 10)
Week of Oct. 13	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	Lime stone karst system; processes, surface forms and caves. (Ch. 12)
Week of Nov. 3	River processes in drainage basins. Development of channels, bars, flood plains, landform and sediments. (Ch. 13)
Week of Nov. 10	Continental ice sheets and alpine glaciers; thermal regimes, geomorphic processes, landforms and sediments. (Ch. 15)
Week of Nov. 17	Periglacial environments; permafrost, active layer cold-zone geomorphic processes, landforms and sediments. (Ch. 16)

Week of Nov. 24	Marine development of beach and rock coast landforms. Submarine erosion and sedimentation. Eustatic and Isostatic sea-level variation.(Ch. 17)
Week of Dec. 1	Geomorphic processes, landforms, and sediments in desert. Eolian (wind-formed) landforms and sediments. (Ch. 14)
Week of Dec. 8	Review

Last day of classes - December 9, 2003

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	30%
	100%

LAB SCHEDULE

Week of:

September 1	Introduction and Mineral Identification techniques	
September 8	Lab 1.	Mineral identification
September 15	Lab 2.	Igneous rocks
September 22	Lab 3.	Sedimentary rocks
September 29	Lab 4.	Metamorphic rocks
October 6	Review Lab -	Minerals and rocks
October 13	FINAL LAB EXAM (PART 1)- open book	
October 20	Topographic maps	
October 27	Topographic maps and cross section	
November 3	Geological maps and structure section	
November 10	Glaciation	
November 17	Review Lab	
November 24	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.