

**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 A2	M W	8:30 – 9:50	Room J227
Labs	L1,L2,L3	RFW	14:30 - 17:20	Room J107

**INSTRUCTOR:**                      **Jason Tuchelt**                      **Office J210**                      **Ph. 539 2048**

**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 the 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 who desire to obtain 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 the 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. 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. ( <b>Mid Term</b> ) (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. 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 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 (Telephone 539-2952), our lab technologist.