

GRANDE PRAIRIE REGIONAL COLLEGE
DEPARTMENT OF SCIENCE
COURSE OUTLINE

FALL SEMESTER 1998-99

EARTH SCIENCE 1010

Introduction Earth And Atmosphere

Lecture	Section A2	M W F	12:00 - 12:50	Room J204
Lecture	Section T2	T R	9:30 - 10:50	Room E306A
Lab	Labs	MTW	15:00 - 17:50	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

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. 7	Introduction to plate tectonics, earth structure and composition. Atomic structure of matter, crystals, minerals and physical properties of minerals. (Ch. 2)
Week of Sept. 14	Classification of rocks, rock cycles. Igneous rocks; classification origin plate tectonic content and distribution. (Ch. 3 & 4)
Week of Sept. 21	Volcanology, volcanic processes and land forms. Sedimentary rocks; classification, clastic versus chemical, lithification processes. (Ch. 5 & 7)
Week of Sept. 28	Metamorphic rocks; classification, metamorphic facies, relation to plate tectonic setting, mineral and energy resources. (Ch. 8 & 23)
Week of Oct. 5	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. 12 (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. 19	The hydrologic cycle, Weathering, mass movement slope processes and landforms. (Ch. 6, 11, & 12)
Week of Oct. 26	River processes in drainage basins. Development of channels, bars, flood plains, landform and sediments. (Ch. 13)
Week of Nov. 2	Continental ice sheets and alpine glaciers; thermal regimes, geomorphic processes, landforms and sediments. (Ch. 15)

Week of Nov. 9	Periglacial environments; permafrost, active layer cold-zone geomorphic processes, landforms and sediments.	(Ch. 16)
Week of Nov. 16	Marine development of beach and rock coast landforms. Submarine erosion and sedimentation. Eustatic and Isostatic sea level variation.	(Ch. 17)
Week of Nov. 23	Geomorphic processes, landforms, and sediments in desert. Eolian (wind-formed) landforms and sediments.	(Ch. 14)
Week of Nov. 30	Lime stone karst system; processes, surface forms and caves.	(Ch. 12)
Last day of classes - December 4, 1998		

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:

September 7	Introduction and Mineral Identification techniques, slides
September 14	Lab 1 Mineral identification
September 21	Lab 2 Igneous rocks
September 28	Lab 3 Sedimentary rocks
October 5	Lab 4 Metamorphic rocks
October 12	Review Lab - Minerals and rocks
October 19	MID TERM LAB EXAM (open book)
October 26	Topographic maps
November 2	Topographic maps and cross section
November 9	Geological maps and structure section
November 16	Glaciation
November 23	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.