GRANDE PRAIRIE REGIONAL COLLEGE
DEPARTMENT OF SCIENCE AND TECHNOLOGY

EARTH SCIENCE 1010

COURSE OUTLINE

WINTER SEMESTER 2001 - 2002

Introduction to Earth And Atmosphere

Lecture	Section B3	TR 10:00 - 11:20	Room J204
Labs	L1, L2, L3	M, F, R 14:30- 17:20	Room J107

INSTRUCTOR: **Dr. Desh Mittra**
Office: # E307, Phone: 539 – 2981, e-mail:Dmittra@gprc.ab.ca

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 Schuster'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 Jan. 6	Course Outline & Introduction. Origin of Earth; Introduction to plate tectonics, earth structure and composition (Ch. 1). Atomic structure of matter, crystals, minerals and physical properties of minerals (Ch. 2).
Week of Jan. 13	Classification of rocks and rock cycles. Igneous rocks; classification, origin, plate tectonic content and distribution. Volcanology, volcanic processes and landforms. (Ch.3, 4,5)
Week of Jan. 20	Sedimentary rocks; classification, clastic versus chemical, lithification processes. Metamorphic rocks; classification and metamorphic facies (Ch.7, 8)
Week of Jan. 27	Minerals and energy resources. Rock Records and Geologic Time Scale (Ch.23. 9)
Week of Feb. 3	Structural geology and rock deformation; folds, faults, plate tectonic setting. Earthquakes; elastic rebound theory, Richter scale, causes of earthquakes, epicentre (Ch.10, 18)
Week of Feb. 10	Earth's interior; seismic evidence, Cosmo-chemical constrains; Earth's magnetism and Paleo-magnetism . Plate Tectonics: The unifying theory (Ch.19, 20)
Week of Feb. 17	Weathering and Erosion. Mass wasting, Mass movement. Slope processes and Landforms (Ch.6, 11)
Mid-Term Exam:- Feb. 20	
Week of Feb. 24	Reading week (No Classes).
Week of Mar. 3	The hydrologic cycle and Groundwater. River processes in drainage basins. Development of channels, bars, flood plains, landform and sediments. (Ch.12, 13)
Week of Mar. 10	Continental ice sheets and alpine glaciers; thermal regimes, geomorphic processes, landforms and sediments. (Ch. 15 plus additional readings)

Week of Mar. 17	Periglacial environments; permafrost, active layer cold-zone geomorphic processes, landforms and sediments. (Ch. 16)
Week of Mar. 24	Marine development of beach and rock coast landforms. Submarine erosion and sedimentation. (Ch. 17)
Week of Mar. 31	Eustatic and Isostatic sea level variation.
Week of Apr. 7	Geomorphic processes, landforms, and sediments in desert. Eolian (wind-formed) landforms and sediments. (Ch. 14)
Week of Apr.14	**Review** and cover any leftover material.

Last day of classes – April 16, 2003

ASSIGNMENTS

You will be given weekly assignments consisting of multiple choice, true/false-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 assignment within given time, a **20%** deduction per day will be applied to your score.

MARKS DISTRIBUTION

Assignments	10%	
Class Tests	10%	
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:	
January 6	Introduction and Mineral Identification
January 13	Lab 1 Mineral identification
January 20	Lab 2 Igneous rocks
January 27	Lab 3 Sedimentary rocks
February 3	Lab 4 Metamorphic rocks
February 10	Review for labs 1 to 4
February 17	**LAB EXAM MIDTERM** (open book)
February 24	**NO LAB (READING WEEK)**
March 3	Lab 5 Topographic maps
March 10	Lab 6 Topographic maps and cross section
March 17	Lab 7 Geological maps and structure section
March 24	Lab 8 Glaciations
March 31	Review labs 5 to 8
April 7	**LAB FINAL EXAM** (closed book)

Note – **All books and material 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.