GRANDE PRAIRIE REGIONAL COLLEGE
DEPARTMENT OF SCIENCE AND TECHNOLOGY

EARTH SCIENCE 2010

3(3-0-0)
COURSE OUTLINE

Introductory Studies in Earth Science

Lecture Section A3 TBA Room : TBA

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

COURSE OBJECTIVES The course has been designed to generate competence in the fundamental concepts of Earth and Atmospheric Sciences through the media of lecture and visual aids. ES 2010 serves both as the introductory course for Earth Sciences without a lab for non-specialists desirous of obtaining knowledge of the Earth and Atmosphere. If some one wants to be specialist and pursue further, you have to take ES 2000 as well.

COURSE Origin of our planet earth and the solar system, 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, mineral and energy resources and earth's interior.

TEXTBOOKS Understanding Earth, by F. Press and R. Siever- 3rd Edition.

OTHER ITEMS Dictionary of Geological Terms

The following approximate schedule of lecture topics is presented as an aid to your study outline:

Week 1 Course Outline & Introduction. Origin of Earth; Introduction to plate tectonics, earth structure and composition (Ch. 1).

Week 2 Atomic structure of matter, crystals, minerals and physical properties of minerals (Ch. 2). Classification of rocks and rock cycles (Ch. 3).

Week 3	Igneous rocks; classification, origin, plate tectonic content and distribution (Ch. 4). Volcanology, volcanic processes and land forms (Ch. 5).
Week 4	Sedimentary rocks; classification, clastic versus chemical, lithification processes (Ch.7). Metamorphic rocks; classification and metamorphic facies (Ch. 8).
Week 5	Metamorphism and Plate Tectonics (Ch. 8). Minerals and energy resources (Ch. 23). Rock Records and Geologic Time Scale (Ch. 9).
Week 6	Structural geology and rock deformation; folds, faults, plate tectonic setting (Ch. 10). Earthquakes; elastic rebound theory, Richter scale, causes of earthquakes, epicentre (Ch. 18).
Week 7	Earth's interior; seismic evidence, Cosmo-chemical constrains; Earth's magnetism and Paleo-magnetism (Ch. 19). Plate Tectonics: The unifying theory (Ch.20).
Week 8	Weathering and Erosion (Ch. 6). Mass wasting, Mass movement, Slope processes and Landforms (Ch. 11).

Mid-Term Exam:-

Week 9	Reading week (No Classes).
Week 10	The hydrologic cycle and Groundwater (Ch. 12). River processes in drainage basins. Development of channels, bars, flood plains, landform and sediments (Ch. 13).
Week 11	Continental ice sheets and alpine glaciers; thermal regimes, geomorphic processes, landforms and sediments (Ch. 15 plus additional readings).
Week 12	Periglacial environments; permafrost, active layer cold-zone geomorphic processes, landforms and sediments (Ch. 16).
Week 13	Marine development of beach and rock coast landforms. Submarine erosion and sedimentation. Eustatic and Isostatic sea level variation (Ch. 17).
Week 14	Geomorphic processes, landforms, and sediments in desert. Eolian (wind-formed) landforms and sediments (Ch. 14).
Week 15	**Review** and cover any leftover material.

ASSIGNMENTS You will be given weekly assignments consisting of multiple choices, true/false-type questions. These assignments are open book and test and exam questions will be based on these assignments.

MARKS DISTRIBUTION

Assignments	20%
Midterm exam	30%
Final exam	50%
	100%

NOTE: This is a non – lab Science course and may not qualify you for credits where lab science course is a requirement.

Students will not receive credit for both ES1010 and ES2010.