Grande Prairie Regional College
Department of Science and Technology

Course Outline
Earth Science 1010 – Introduction to Physical Earth Science
Winter 2004

Lecture: Tuesday and Thursday an 8:30 – 9:50 in room J204
Laboratory: Monday, Thursday, Friday at 2:30 to 5:20 in room J107

Instructor: Jason Tuchelt
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Office Hours: no set hours, please make an appointment or just come on by my office - J210

Course Summary
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.

Course 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.

Laboratory Objective
Identification of: minerals, sedimentary rocks, igneous rocks and metamorphic rocks. Use of topographic maps, creating cross-sections, reading geologic maps and structures and landform identification.

Textbook
Understanding Earth, by F. Press and R. Siever

Lab Book
Lab exercises for Earth Science 1010 which is a photocopied lab manual

Other Items (not required but may prove useful)
Simon and Schuster's Guide to Rock's and Minerals or any equivalent book.
Dictionary of Geological Terms

All books and materials are available at the College Bookstore
Labs can be used for studying rocks, minerals or maps other than scheduled lab hours by pre-arranging with Medha Karnik the lab technologist (Telephone 539-2952)

Mark Distribution

Lecture Mid Term Exam	20%
Lecture Final Term Exam	30%
Lecture Assignments	20%
Laboratory Mid Term Exam	7.5%
Laboratory Final Term Exam	7.5%
Lab Assignments	10%
Lab Quizzes	5%

Laboratory and Lecture Term Exams
The lecture and laboratory will each have 2 tests throughout the semester. The first will occur in the middle of the semester and the second at the end of the semester. The tests will not be cumulative.

Lecture Assignments
You will be given four separate assignments over the semester that will seek for you to use your knowledge from the lecture and apply them into practical and real world problems in geology (instead of just rehashing memorized facts).

Laboratory Assignments
You will be responsible to complete a lab assignment during the laboratory period. The topics covered in the lab will closely follow those taught in the lecture section for that week,

Laboratory Quizzes
You will have a short 15-30 minute quiz on the material that was presented in the week's previous laboratory.

Late Assignments
For all lecture and lab assignments that are not handed in on the assigned due date a 10% per day penalty will be applied. No assignments will be accepted if they are over 3 days late.

Sickness / Family Emergencies
If you are sick or have a family emergency occurring on an exam or quiz date you must contact the instructor as soon as possible and provide a doctors or family members letter (whichever is applicable) to the instructor as soon as possible for you to get a rewrite of the exam. Missing exams due to outside work obligations is not a suitable excuse.

Missing Labs
If for some reason you cannot make your assigned lab session please make sure to make it up that week! You may come to another one of the session for that week but make sure to OK it with the assigned lab instructor (myself or Desh Mittra, Room J, Telephone) first!

Lecture Schedule

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

Week	Topic	Chapter
Jan. 5	Introduction and Course Outline Origins and Structure of the Earth The Geologic Time Scale	1
Jan 12.	Introduction to Plate Tectonics, Earth Structure and Composition Atomic structure and Physical Properties of Minerals	2
Jan. 19	Classification of Rocks and the Rock Cycle Igneous Rocks: their origin and classification, plate tectonic content and distribution	3, 4
Jan. 26	Volcano logy: volcanic processes and landforms	5, 7
Feb. 2	Metamorphic Rocks: their origin and classification, metamorphic facies, relation to plate tectonics	8
Feb. 9	Structural Geology: rock deformation, folds, faults, plate tectonics setting Geologic time: absolute vs. relative dating, principles of stratigraphy, relative and absolute age dating **Mid Term Exam**	9, 10
Feb. 16	Reading Week – No Classes	
Feb. 23	Earthquakes: elastic rebound theory, Richter scale, causes of earthquakes Earths Magnetism and Paleomagnetism	18, 19
Mar. 1	The Hydrologic Cycle Karst Topography: system processes, surface forms and caves	6, 11
Mar. 8	Weathering, mass movements, slope processes and landforms	12
Mar. 15	Fluvial processes: river and drainage basins, development of channels, bars, flood plains, landforms and sediments	13
Mar. 22	Continental ice sheets and alpine glaciers: thermal regimes, geomorphic	15

	processes, landforms and sediments	
Mar. 29	Periglacial environments: permafrost and the active layer, landforms and sediments	N/A
Apr. 5	Marine environments: development of beach and rock coast landforms, submarine erosion and sedimentation, eustatic and isostatic sea level change	17
Apr. 12	Eolian environments: geomorphic processes, landforms and sediments Landscape evolution	14, 16
Apr. 16	**Last Day of Classes**	

Lab Schedule

Week	**Topic**
Jan. 12	Mineral Identification I
Jan. 19	Mineral Identification II
Jan. 26	Igneous Rocks
Feb. 2	Sedimentary Rocks
Feb. 9	Metamorphic Rocks
Fed. 23	**Laboratory Mid Term Exam – open book**
Mar. 1	Topographic Maps I
Mar. 8	Topographic Maps II
Mar. 15	Topographic Maps III
Mar. 22	Geologic Maps
Mar. 29	Glacial Landforms
Apr. 5	**Laboratory Final Term Exam – closed book**