

EESB15 Earth History Autumn 2013

Rationale:

This course will provide you with a systematic review of the evolution of environments on planet Earth over the last 4500 million years, and in particular, the geology and history of the North American continent and the Canadian landmass.

The latter part of the course touches on how knowledge of geology (now termed geoscience by many) is fundamental to environmental investigations relating to the disposal of wastes, managing contaminants, finding adequate water supplies, safeguarding natural habitat, dealing with urban development and flood waters, energy sources, earthquakes etc. We will touch on how geophysics is used in environmental geoscience investigations.

Many of you will wish to pursue a career in Ontario in environmental science perhaps working as part of a team for an environmental consulting company or in a government environmental agency. At the moment there is a great demand for geoscientists in western Canada dealing with the environmental consequences of energy extraction. These are good times for geoscientists and there are more jobs than people. If you like the outdoors and want to pursue a career where there are great opportunities for travel and fieldwork, geoscience could be for you.

Overview:

Planet Earth is at least 4500 million years old (4.5 billion or abbreviated to 4.5 Ga meaning giga annum) and a direct geological record (i.e., rocks!) exists for at least the last 3.8 billion years in the form of volcanic, metamorphic and sedimentary rocks. The oldest fossils of ancient life forms found on planet Earth (simple cyanobacteria) are thought to be 3.46 billion years old.

The changing dynamics of convection deep within the Earth's mantle and associated supercontinent assembly and breakup along with meteorite impacts, are now recognized as the major controls on development of the planet's atmosphere, oceans, biology, climate and geochemical cycles. This course reviews this long history and the methods and techniques used by geologists to identify ancient environments and the nature of the fossil record. We will trace the beginnings of plate tectonics on early Earth and the evolution of the modern continents. The effects of climate change on the Canadian landmass, especially glaciations of the last few million years will be reviewed.

Instructor: Ms. Lisa Tutty BSc (hon) MSc PhD candidate in Geology

Office Hours: Monday 1 – 5 in portable #104 room 109 (this is a *shared* office; I am *only* there during my scheduled office hours). Office hours beginning Sep 10, ending Dec 3. If you don't find me there check SW313, I may be still putting lab samples away after lecture.

EESB15 Earth History Autumn 2013

Contact information: please use the discussion board on Blackboard (BB) for all course related communication. You may discuss matters of a *personal* nature (e.g. illness) during the office hours or by email (tutty@utsc.utoronto.ca). I like being able to discuss course relate

EESB15 Earth History Autumn 2013

Marking Scheme:

Midterm test (date to be scheduled by registrar) - **15%**

Weekly lab participation - **15%**

Niagara Field Trip (date TBA) and individual activity - **10%**

Georgian Bay Field Trip (Se 28-30) **OR**

Group/individual poster on another topic (date midway in Nov, TBA) - **25%**

Final exam - **35%**

If you need me to contact another professor regarding the field trip dates I am happy to do so, please let me know in advance.

Academic Integrity Statement:

Academic integrity is one of the cornerstones of the University of Toronto. It is critically important both to maintain our community which honours the values of honesty, trust, respect, fairness and responsibility and to protect you, th

EESB15 Earth History Autumn 2013

SCHEDULE SUBJECT TO CHANGE

Date	"Lab type activities", 2pm r 4pm	Lecture noon 2pm; Readings
Se9	Lab1:Plate tectonics lab	Lec1: Beginnings of planet Earth & evolution of the lithosphere. Chapter 1 & 2.
Se16	Lab2: Minerals lab	Lec2: Major scientific developments, continental drift & plate tectonics
Se23	Lab3: Metamorphic rocks lab	Lec3: Layer 1 Precambrian rocks of Canada Chapters 3 & 4.
Se 28 & 30	Georgian Bay 3 day field trip (for those not doing posters)	
Se 30	No lecture! DUETO Georgian Bay field trip	No lecture today (trip)
Oc7	Lab4: Igneous rocks lab	Lec4: Layer 2 Paleozoic rocks of Canada Pt 1 East Coast. Chap 5 & 6.

Oc14 Chapters 7 & 8 Unit 3 & 4. CTT13 14.656 Tc ((for) Tj / TT13 1 Tf 1.485 0 -