Proposed Syllabus for GEO304

**Introduction to Geochemistry (304): Planet Earth 01:460:304:01 Fall 2015**

Low and high temperature geochemistry, element distribution, geochemical structure of the Earth, Laboratory exercises include sample materials, preparation techniques, mass spectrometry, data collection, reduction and interpretation.

**Textbook (purchase is optional, but useful if you want to continue with Geochemistry)**

Geochemistry (W. M. White: RU library electronic textbook)
Principles and Applications of Geochemistry (G. Faure)

**Instructors BT - Brent Turrin; RM – Rick Mortlock; MF – Mark Feigenson; LG – Linda Godfrey**

**Tues. 12:00-13:20**
**Thurs. 12:00-15:00**

**September**
Lecture 1: Chapter 1: class introduction: scientific notation, useful conversions
Lecture 2: Chapter 1 Structure of Atoms, finding your way around the periodic table –in-class problems set (BT)

Lecture 3: Chpt 2- Equilibrium, Thermodynamics, pH (LG)
Lab 1: Chpt-2 Water sampling (LG)

Lecture 4: CO₂, weathering and low temp systems (LG)

Lecture 5: low temp stability fields, distribution coefficients (LG)
Lab 2: Optical ICP lab in DCMS or EPS (LG)

Lecture 6 Chemical Structure of the Earth: Element Distribution (BT)

**October**
Lab 3: Thermodynamics heat capacity LAB (LG)

Lecture 7: High temp Phase Diagrams (MF)
Lab 4: Field trip: Sampling of Palisades Sill (BT)

Review for Midterm
Lecture 8: MIDTERM

Lecture 9: Trace Metals (REE, lattice substitutions) (MF)
Lab 5: Micro-Probe or Laser Ablation ICP-MS Lab (analysis of igneous rock samples) (BT/TBA)

Lecture 10: 10.11 Formation of the Elements, Cosmic Abundances (BT)
Lecture 11 Chapter 8 Isotopes, Intro to Radiogenic Isotopic Systems and Sr-Rb geochronology (RM)

**November**
Lecture 12: Chapter 8 cont with U-Th geochronology (RM)
Lecture 13 Chapter 9 Stable Isotopes (RM)
Lab 6: Isotopic Systems: Sr isotope lab chemical separations (LG/RM)

Lab 6 continued: Sr isotope analyses by Multi-collector ICP-MS
Lecture 14: Marine Geochemistry- chemistry of the oceans (RM)

Lecture 15 2nd Mid-term Exam/ assignments for oral presentations

Thanksgiving Recess

**December**
Week 1: Researching class presentation topics

Week 2/3: Class Presentations

Grading:
Mid-terms 20% each
Problem sets and Lab 30%
Class presentation 30%