# *Course Syllabus:*

# EESC GR 6700 – Magmatism and Volcanism, 3 credits
# Spring 2019

Professor: Terry Plank
Department of Earth and Environmental Sciences
Office Hours: Lamont, by appointment
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Class Meeting Time: 10:10 – 11:25am MW • Comer Kennedy

**Overview** This course explores the origin of magmas and their subsequent movements; their ascent, stalling and eruption; their transport of heat and mass through the earth; their formation of crust and creation of volcanoes. The course will explore magmatism itself - its chemical and physical underpinnings – and also develop magmatic tools used to understand other earth processes. Topics will be focused around Grand Questions. Example questions include: What do magmas tell us about the thermal structure of the earth? Why do magmas store and stall where they do? What drives the largest eruptions on Earth? Does continental extension drive melting or melting drive extension? Questions will evolve to reflect the state of the field and student interest. The course is designed to serve as an accessible breadth course for Earth Science graduate students in any discipline.

**Course Structure** Each week will be devoted to a Grand Question, with a structured lecture providing fundamental background, and discussion of a key paper that articulates the question. Students will also research current papers on each topic, and provide short lightning talks on these. Problem sets will provide hands-on worked examples of magma principles and modeling tools for estimating pressure, temperature and other parameters of interest. The final research paper (≤ 10 pp of text) will be due at the end of the semester, on a topic of choice to the student.

**Class Participation** involves regular attendance, engagement in discussion, asking good questions related to readings, lectures and lightning talks, and providing feeback to other participants.

**Pre-requisites** graduate student status and coursework equivalent to admissions requirements to the Earth and Environmental Science Ph.D. program (one year each chemistry, calculus, physics) and at least two courses in geology/geophysics/geochemistry disciplines; or permission of instructor.

**Required Textbook**: There is no required textbook. Readings will be freely available from on-line resources.

**Class Schedule and Other Events:** Attached is a preliminary class schedule.

**Late Work**: Problem sets must be handed in on the date assigned in class. Ten points will be deducted (out of 100 total points) for each day late.

**Grading Criteria:**

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|---|---|
| Problem Sets (3): | 30% |
| Final Paper: | 20% |
| Class Participation: | 50% |
| Total | 100% |

**Academic Integrity:** Students are expected to do their own work on all tests and assignments for this class and act in accordance with the Faculty Statement on Academic Integrity and Honor Code established by the students of Columbia College and the School of General Studies. Because any academic integrity violation undermines our intellectual community, students found to have cheated, plagiarized, or committed any other act of academic dishonesty can expect to [specify academic sanction: fail the class/receive a zero for the work in question] and may be referred to the Dean's Discipline process.

*Magmatism and Volcanism*

**EESC 6700 Schedule, MW 10:10 -11:25 am, Spring 2019**

Instructor: Prof. Terry Plank

| # | | Date | Topic | |
|---|---|---|---|---|
| 1 | Mon | 21-Jan | ***MLK Day - no class*** | |
| | Wed | 23-Jan | Intro to class/input from students | |
| 2 | Mon | 28-Jan | *Lecture - where does melting begin? (Magmagenesis)* | |
| | Wed | 30-Jan | Lightnings on magmagenesis | |
| 3 | Mon | 4-Feb | *Lecture - how hot is the mantle?* | |
| | Wed | 6-Feb | Lightnings on mantle T | |
| 4 | Mon | 11-Feb | *Lecture - melting drives extension or v.v.?* | |
| | Wed | 13-Feb | Lightnings on extension | |
| 5 | Mon | 18-Feb | *No class - get started on PS-A, Paper Ideas* | PS-A out |
| | Wed | 20-Feb | Meet one-on-one, go over presentations, paper ideas | |
| 6 | Mon | 25-Feb | *Read Paper Together* | |
| | Wed | 27-Feb | *No class - Finish PS-A, Work on Paper Ideas* | PS-A due |
| 7 | Mon | 4-Mar | | Paper Idea Due |
| | Wed | 6-Mar | | |
| 8 | Mon | 11-Mar | | |
| | Wed | 13-Mar | | |
| | Mon | 18-Mar | ***no classes - CU Holiday*** | |
| | Wed | 20-Mar | ***no classes - CU Holiday*** | |
| 9 | Mon | 25-Mar | | PS-B out |
| | Wed | 27-Mar | | |
| 10 | Mon | 1-Apr | | PS-B due |
| | Wed | 3-Apr | | |
| 11 | Mon | 8-Apr | | |
| | Wed | 10-Apr | | |
| 12 | Mon | 15-Apr | | |
| | Wed | 17-Apr | | |
| 13 | Mon | 22-Apr | | PS-C out |
| | Wed | 24-Apr | | |
| 14 | Mon | 29-Apr | | PS-C due |
| | Wed | 1-May | | |
| 15 | Mon | 6-May | | |

Finals Week = May 10-17 — Final Paper Due