EPSC 111A: Introduction To Global Climate Change In the 21st Century
Department of Earth and Planetary Sciences ● Washington University


Prerequisites: None. (EPSc 108A, “Oceans and the Atmosphere” is recommended but not required.)

Course Description: We discuss global climate and global climate variability and the impact of both on all life, as well as human civilization. We integrate global climate with the diverse forces that can alter global climate. We will define historical, and estimate potential future consequences of global climate variation. Particularly, we will study the balance between human life, our industrial civilization, and its energy consequences in regard to environmental sustainability.

Course Topic Sequence:
1. Definition of Science and signals, Climate components, physics, units, and some solar aspects (week 1)
2. Glaciation cycles and aspects of climate change over thousands to millions of years (week 2)
3. The structure of the Atmosphere and the Ocean; The structure of Water in the climate context (weeks 3 and 4)
4. The Arctic Ocean and The Mean Sea Level in the Global Climate context (weeks 5 and 6)
FIRST EXAM/problem set
5. Combined Oceanic and Atmospheric Models for the Global Climate and GCC (week 7)
6. Verification and measurements essential for GCC models (weeks 8 and 9)
7. What Historical GCC tells us about Models and their Predictive Powers (week 10)
8. Concepts of constant increase in finite systems, climate change, and sustainability (week 11)
9. Energy Requirements of Civilization and the Global Climate System (weeks 12)
10. Sustainability Issues in the Context of Global Climate (Week 13)
Final Exam/problem set

Grading structure and criteria:
Written examinations (2) are given during the term, dates listed below. The exams are not cumulative. Exam material will be derived entirely from the lectures. Power Points of lectures will be placed on-line, along with documentaries. Exams include essay type questions on selected topics from the power points. Problem sets will consist of simple, non-calculus problems related to the lecture material and will be “take-home”.
Graded exams will typically be returned and reviewed following the exam. Extra credit will be given for pop quizzes.
Grades: 70 = C, 80 = B, AND 90 = A, WITH 0-3 Ø, 4-6 Ø, 7-9 +. Pass-Fail/Credit-No credit >70%.

March 1 first exam with problem set sent; due on March 8, 2019
April 19, second exam with problem set sent; due on 26 April, 2019

Attendance: Attendance is compulsory. Two unexcused absences per semester are permitted. All further absence requires your instructor’s approval in advance. An unapproved absence results in one-half grade step penalty, i.e. A to A-. Makeup exams are given only for absences due to documented illnesses or family emergencies.

IMPORTANT: The class procedures and rules contain, by reference, all rules pertaining to the Washington University student manual, the faculty manual, and all other pertinent rules for class activities and behavior.

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