



Course Approval Form

For approval of new courses and deletions or modifications to an existing course.

registrar.gmu.edu/facultystaff/curriculum

Action Requested:

Create new course Inactivate existing course

Modify existing course (check all that apply)

Title Credits Repeat Status Grade Type

Prereq/coreq Schedule Type Restrictions

Other: Cross-List existing Course GGS 312 with CLIM 312

Course Level:

Undergraduate

Graduate

College/School: College of Science Department: Atmospheric, Oceanic & Earth Sciences

Submitted by: Barry Klinger Ext: 3-9227 Email: bklinger@gmu.edu

Subject Code: CLIM Number: 312 Effective Term: Fall Spring Summer

(Do not list multiple codes or numbers. Each course proposal must have a separate form.) Year 2014

Title: Current Physical Climatology

Banner (30 characters max including spaces) _____

New _____

Credits: Fixed or Variable to

Repeat Status: Not Repeatable (NR) Repeatable within degree (RD) Repeatable within term (RT) Maximum credits allowed: 3

Grade Mode: Regular (A, B, C, etc.) Satisfactory/No Credit Special (A, B, C, etc. +IP)

Schedule Type: Lecture (LEC) Lab (LAB) Recitation (RCT) Internship (INT)

Independent Study (IND) Seminar (SEM) Studio (STU)

Prerequisite(s): CLIM/PHYS 111/112 OR GGS 121; and PHYS 243,244, or permission of instructor

Corequisite(s): _____

Instructional Mode: 100% face-to-face Hybrid: ≤ 50% electronically delivered 100% electronically delivered

Restrictions Enforced by System: Major, College, Degree, Program, etc. Include Code.

Are there equivalent course(s)? Yes No

If yes, please list GGG 312

Catalog Copy for NEW Courses Only (Consult University Catalog for models)

Description (No more than 60 words, use verb phrases and present tense)	Notes (List additional information for the course)
Quantitative description of nature and theory of the climate system, dynamics of atmosphere-ocean-land surface, internal interactions and response to external forcing, description of the climate record and simple climate models.	Cross list with GGS 312
Indicate number of contact hours: _____ Hours of Lecture or Seminar per week: <u>3</u> Hours of Lab or Studio: _____	
When Offered: (check all that apply) <input type="checkbox"/> Fall <input type="checkbox"/> Summer <input checked="" type="checkbox"/> Spring	

Approval Signatures

Department Approval _____ Date _____ College/School Approval _____ Date _____

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

For Graduate Courses Only

Graduate Council Member _____ Provost Office _____ Graduate Council Approval Date _____

For Registrar Office's Use Only: Banner _____ Catalog _____

Course Proposal Submitted to the Curriculum Committee of the College of Science

1. COURSE NUMBER AND TITLE: CLIM 312: Physical Climatology

Course Prerequisites: MATH 113, or equivalent; CLIM/PHYS 111/112 or GGS 121; PHYS 243,244

Catalog Description: Quantitative description of nature and theory of the climate system, dynamics of atmosphere-ocean-land surface, internal interactions and response to external forcing, description of the climate record and simple climate models.

2. COURSE JUSTIFICATION:

Course Objectives: The students should gain a basic understanding of the radiative processes that force the climate system. They should become familiar with the basic dynamics and thermodynamics of the the atmosphere and ocean circulation, and their mutual interaction and interaction with the land surface. The course will enable students to understand not only the present climate, but also past climates and future climate simulations. A focus is how the entire climate system responds to external forcing.

Course Necessity: This course fills a gap in the atmospheric science curriculum within the undergraduate degrees in the AOES department. It serves not only as an introduction to the general circulation of the atmosphere and ocean and to global radiative and thermodynamic processes, but also provides students with the ability to integrate these into an understanding of how the climate has changed and may change in the future.

Course Relationship to Existing Programs: This course will be an elective in the (new) BS in Atmospheric Sciences degree, and an elective in the BS in Earth Sciences degree. It currently serves an elective in the GGS BS degrees in Global and Environmental Change and Geography.

Course Relationship to Existing Courses: This course is cross-listed with the existing GGS 312. It will prepare AOES students for 400-level classes such as PHYS 475 and GGS 456. The course complements, but does not significantly overlap, with CLIM 301 and CLIM 314.

3. APPROVAL HISTORY:

4. SCHEDULING AND PROPOSED INSTRUCTORS:

Semester of Initial Offering:
Fall 2014

Proposed Instructors:
Paul Houser

5. TENTATIVE SYLLABUS:

Overview: Quantitative description of nature and theory of the climate system, dynamics of atmosphere-ocean-land surface, internal interactions and response to external forcing, description of the climate record and simple climate models.

Instructor: Dr. Paul R. Houser Telephone: 301-613-3782 Office: Innovation – Room 2209

E-mail: Phouser@gmu.edu

Required text: Global Physical Climatology (Dennis L. Hartmann, Academic Press, pp. 411)

Prerequisites: 30 hours; and GGS 121 or CLIM 111/112, MATH 113, PHYS 243-244, or permission of instructor.

Week 1:	Ch1: Intro to climate system 1	
Week 2:	Ch1: Intro to climate system 2	HW 1 assigned
Week 3:	Ch2: Global energy balance	
Week 4:	Ch3: Radiation, clouds and climate	HW 2 assigned
Week 5:	Ch4: Surface energy balance	
Week 6:	Ch5: Hydrological cycle	HW 3 assigned
Week 7:	Project proposal presentation, discussion	
Week 8:	Ch6: Atmospheric circulation	HW 4 assigned
Week 9:	Ch7: Ocean circulation	
Week 10:	Ch8: Paleoclimate	HW 5 assigned
Week 11:	Ch9: Climate sensitivity and feedback	
Week 12:	Ch10: Climate modeling	
Week 13:	Ch11: Natural climate change	
Week 14:	Ch 12: Anthropogenic climate change	
Week 15:	Ch 12 (continued);Final project and paper presentation	

Procedure: Material will be covered by lectures, not necessarily restricted to the text and handouts. Students are expected to read the text and other assignments thoroughly prior to the lecture.

Evaluation: All work must be your own. A grade of "0" will be assigned for any work which is clearly not your own or cheating of any type.

Homework 30% - Five homework assignments

Quizzes 20% - Random closed-book 5min quizzes – lowest score dropped

Class Project 50% - Proposal, 2 presentations

Homework assignments: All assignments should be done neatly and professionally, and Emailed to instructor by due date. Incorrect homework may be neatly reworked on a separate sheet of paper and resubmitted for re-evaluation and partial credit.

Climate Indicator Project: This year's project will be to develop a short (3-5 page) proposal (1) to NASA Climate Indicators (A.47) solicitation, present the proposal to the class (2), and then develop a prototype of the indicator for presentation to the class by the end of the semester (3). Projects will be graded according to indicator originality, usefulness, and execution. Note that the project does not need to be NASA-specific