

## Cover Sheet: Request 13154

### MET4XXX Thermodynamics of the Atmosphere

#### Info

Process	Course New Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Esther Mullens emullens@ufl.edu
Created	10/10/2018 11:13:35 AM
Updated	11/3/2019 11:01:52 AM
Description of request	New Course Request for Core Meteorology Course. Planned Fall 2019.

#### Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CLAS - Geography 011609000	Jane Southworth		1/4/2019
No document changes					
College	Recycled	CLAS - College of Liberal Arts and Sciences	Joseph Spillane	The Committee recycles this request, with the following changes needed: 1) remove the co-listing explanation, unless there is going to be a specific-numbered graduate version of the course; 3) please clarify the repeatable credit--if the course is repeatable, then 6 repeatable credits allowed; 3) please revise the Course Description using the committee's guide (see link below); 4) please revise the Course Objectives (see the link below for assistance); 6) consider changing Transcript Title to "Thermo of Atmosphere"  <a href="https://gov.clas.ufl.edu/files/CorProblems-Checklist.pdf">https://gov.clas.ufl.edu/files/CorProblems-Checklist.pdf</a>	2/8/2019
No document changes					
Department	Approved	CLAS - Geography 011609000	Jane Southworth		3/18/2019
No document changes					
College	Recycled	CLAS - College of Liberal Arts and Sciences	Joseph Spillane	None of the requested changes have been made.	4/22/2019
No document changes					
Department	Approved	CLAS - Geography 011609000	Jane Southworth		7/21/2019
No document changes					

Step	Status	Group	User	Comment	Updated
College	Conditionally Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane	The College Curriculum Committee conditionally approves this request, with the following changes requested: 1) please make sure all the course objectives conform to UCC style guidelines (see <a href="https://gov.clas.ufl.edu/files/College-Curriculum-Committee-Problems-Checklist.pdf">https://gov.clas.ufl.edu/files/College-Curriculum-Committee-Problems-Checklist.pdf</a> ); 2) please change "affecting" to "affect" in the course description.	10/14/2019
No document changes					
Department	Approved	CLAS - Geography 011609000	Jane Southworth		10/24/2019
No document changes					
College	Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane		11/3/2019
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			11/3/2019
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

## Course|New for request 13154

### Info

**Request:** MET4XXX Thermodynamics of the Atmosphere

**Description of request:** New Course Request for Core Meteorology Course. Planned Fall 2019.

**Submitter:** Esther Mullens emullens@ufl.edu

**Created:** 12/9/2019 10:59:35 AM

**Form version:** 19

### Responses

**Recommended Prefix** MET

**Course Level** 4

**Number** XXX

**Category of Instruction** Advanced

**Lab Code** None

**Course Title** Thermodynamics of the Atmosphere

**Transcript Title** Thermo of Atmosphere

**Degree Type** Baccalaureate

**Delivery Method(s)** On-Campus

**Co-Listing** No

**Co-Listing Explanation** None

**Effective Term** Earliest Available

**Effective Year** 2019

**Rotating Topic?** No

**Repeatable Credit?** No

**Amount of Credit** 3

**S/U Only?** No

**Contact Type** Regularly Scheduled

**Weekly Contact Hours** 3

**Course Description** Detailed survey of atmospheric thermodynamics, which deals with energy transfers and processes involving moisture and stability that affect atmospheric motions and weather systems. Lecture material reinforced and supplemented through lab exercises. This class will appeal to those who intend to pursue a profession in meteorology, physics, atmospheric/climate science or engineering.

**Prerequisites** MET3503 (C) &

CHM 2045 (C) &

MAC 2312 (C) &

PHY 2048/L (C)

**Co-requisites** None

**Rationale and Placement in Curriculum** This course is a 'core' course in meteorology, and one of several that will be developed in the coming years to grow UF's meteorology program. This course is more numerically intensive, and students may enroll once they have completed math/physics prerequisites, as well as introductory meteorology courses.

**Course Objectives** Students who successfully complete this course will be able to:

- Explain the basic principles of thermodynamics as they apply to dry and moist air-masses and describe how different phases of water affect thermodynamic processes in the atmosphere
- Apply their understanding of the basic theory to describe how thermodynamic processes lead to the observed structure of the atmosphere globally and regionally
- Calculate, from observations and models, the stability structure of the atmosphere and its implications for weather phenomena.
- Explain the mechanisms that lead to precipitation development and modulation of precipitation type and intensity.

**Course Textbook(s) and/or Other Assigned Reading** Wallace and Hobbs - Atmospheric Science, an Introductory Survey (2nd Edition up) ISBN-13: 978-0127329512 - selected chapters on thermodynamics.

Sam Miller - Applied Thermodynamics for Meteorologists ISBN-13: 978-1107100718. This would be the core text for the course.

Final course texts subject to change

**Weekly Schedule of Topics** Weeks 1-2: Overview, basic concepts, atmospheric context

Weeks 3-4: First law of thermodynamics

Weeks 5-6: Second law of Thermodynamics

Weeks 7-8: Thermodynamics of dry and moist air

Week 9: Thermodynamic diagrams

Weeks 10-11: Atmospheric statics

Weeks 12-14: Mixing and stability

Weeks 15: Precipitation formation

Week 16: Final exam

Schedule of assessments

Midterm to be held first or second week in October

6-8 homework assignments spread throughout the semester, due approximately every other week

Project will be initiated after the mid-term and due the last week of class.

Regular in-class activities, approximately one graded activity per two-weeks

**Links and Policies** Syllabus will contain

Grading scheme <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Policy on absences (including religious) Class attendance & class participation

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Accommodations & DRC [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)

Sexual misconduct

Academic misconduct & student code <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

Health and Wellness <https://counseling.ufl.edu/>

Evaluations <https://evaluations.ufl.edu>

**Grading Scheme** Assessments to measure learning will consist of:

- Homework, such as short essays, mathematical analysis, and online quizzes.
- A mid-term and final exam
- Regular in-class exercises (roughly one per two weeks) within a portion of the regular class period, to be graded bi-weekly.
- Class participation, including group activities applying theory to real-world meteorological events, online discussions based on textbook readings and/or critical evaluations of assigned reading from peer-reviewed literature.
- Individual projects on an aspect of the course material, culminating in a scientific paper and brief presentation. In particular, they will be asked to explain the concepts for a non-scientific audience and why the concept is important to the meteorological event or condition that their project is based on.

Grade breakdown:

Two exams (30% total) - one midterm (10%), one final (20%).

In class and online group participation (e.g., through attendance, online and in-class discussion, short activities) - 10% of grade.

In-class graded assignments - 10% of grade (anticipate 6-8 activities, consisting of short-answer questions & calculations)

Individual home works - 30% of grade. Six planned, will involve more extensive short answer, short essay, data interpretation and math analysis.

Semester project (individual) - 20% (culminates in scientific paper and short 5-8 minute oral presentation).

**Grades**

A => 90

B+ = 86-89.99%

B = 83-86.99%

B- = 80-82.99%

C+ = 77-79.99%

C = 73-76.99%

C- = 70-72.99%

D+ = 67-69.99%

D = 63-66.9%

D- = 60-62.99%

**Instructor(s)** Dr Esther Mullens, Assistant Professor, University of Florida

Lecturer in atmospheric science (TBC).