

# GGG 670 Fall 2018

## Introduction to Atmosphere and Weather

<http://estc.gmu.edu/Course/GGS670-18/>

### Course Information:

Title: GGS 670 Introduction to Atmosphere and Weather

CRN: 81734

Time: 04:30 pm-7:10 pm, Tuesdays, 08/27-12/19/2018

Location: Exploratory Hall 2312

Instructors: [Prof. John Qu](#) and [Dr. Xianjun Hao](#)

Telephone: (703) 993-3958 and (703)-993-9322

Office: Room 2412, and Room 3409 Building: Exploratory Hall

Office Hour: Stop by 1:30-3:30PM Tuesdays or make appointment

### Course Description:

This course will introduce the students to the fundamental principles upon which the atmospheric sciences are based and to provide quantitative description and interpretation of the wide range of atmospheric phenomena with an emphasis on sub-synoptic scales (i.e. weather and regional scale climate). One of the main goals of this course is not only to provide the basic knowledge of fundamentals of the atmosphere science and weather, but also to prepare students for the science of climate. This course is designed for both science majors and non-majors taking their first course in atmosphere science. We will focus on “Eco-meteorology” in Fall 2018.

### Prerequisites

College Math (such as MATH 214) and physics (such as PHYS 262), or permission of instructor.

### Final project:

Weather and atmosphere science related final presentations and final term papers are encouraged.

### Grading:

Grades will be based upon your performance on the homework exercises, midterm, class attendance and final term paper and presentation. The weighted contribution of each of these items to your final grade is given below:

Homework 30%

Midterm 30%

Final Project 30%

Class attendance 10%  
(A=90-100, B=80-89, C=70-79, D=60-69, F=<60)

### **Textbook:**

Required Textbook:

Required Textbook: “Meteorology: Understanding the Atmosphere”, Fourth Edition, by Steven A. Ackerman and John A. Knox 2014, Jones & Bartlett Learning (2014), ISBN 978-1-284-02737-2 (paperback edition), 575 pages.

Recommended References:

1: Wallace, J. M., and P. V. Hobbs, Atmospheric Science: An Introductory Survey (Second Edition), Academic Press, 2006.

### **Detailed Schedule**

Week one 08/28	Introduction to the Atmosphere
Week two 09/04	The Energy Cycle
Week three 09/11	Energy Balance and Temperature
Week four 09/18	Water in the Atmosphere
Week five 09/25	Observing the Atmosphere
Week six 10/02	Atmospheric Forces and Winds
Week seven 10/09	Global and Small Scale Winds Mid-term
Week eight 10/16	Atmosphere-Ocean Interactions: El Niño and Tropical Cyclones
Week nine 10/23	Air Masses and Fronts (DL)
Week ten 10/30	Extratropical Cyclones and Anticyclones
Week eleven 11/06	Thunderstorms and Tornadoes
Week twelve 11/13	Independent Reading for final project
Week thirteen 11/20	Weather and Climate Forecasting
Week fourteen 11/27	Past, Present and Future Climate
Week fifteen 12/04	Final project presentations
Week sixteen 12/11	Final term papers