**GGS 670 Fall 2016**

Introduction to Atmosphere and Weather

http://courses.gmu.edu/GGS670/

Course Information

Title: GGGS 670 Introduction to Atmosphere and Weather

CRN: 79014

Time: 04:30 pm-07:10 pm, Tuesdays, 08/29-12/20

Location: Room 2312, Exploratory Hall

Instructor: Dr. Donglian Sun

Telephone: (703) 993-4736

Office: Room 2413, Exploratory Hall

Office Hour: Stop by Wednesday 2:00-5:00PM or make appointment

Course Description

This course will introduce fundamental principles of the atmospheric sciences, weather and climate and provide quantitative description and interpretation to 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 the meteorology and climate, but also to prepare students for the science of atmospheric modeling and simulations. This course is designed for both science majors and non-majors taking their first course in atmosphere science.

Prerequisites

MATH 214 and PHYS 262, or permission of instructor.

**Class schedule**

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| Date | Topic |
| Week one, 8/30 | Introduction  The Earth and its Atmosphere |
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| Week two, 9/6 | Energy: Warming the Earth and the Atmosphere  Physical Basis of Radiative Transfer Models |
| Week three, 9/13 | Seasonal and Daily Temperatures |
| Week four, 9/20 | Atmospheric Pressure and Winds |
| Week five, 9/27 | Atmospheric Moisture and Clouds  Fog and Low Clouds |
| Week six, 10/4 | [Precipitation Processes](http://wps.prenhall.com/esm_aguado_uwac_3/11/2881/737598.cw/index.html) |
| Week seven, 10/11 | Atmospheric Circulation and Pressure Distributions |
| Week eight, 10/18 | Mid-term exam |
| Week nine, 10/25 | Air Masses and Fronts |
| Week ten, 11/1 | Mid-latitude Cyclones, Thunderstorms and Tornadoes |
| Week eleven, 11/8 | Tropical Cyclones and Hurricanes |
| Week twelve, 11/15 | Impacts of Severe Weather on Economy |
| Week thirteen, 11/22 | Weather Forecasting and Analysis  Numerical Weather Models and Prediction |
| Week fourteen, 11/29 | [Human Effects: Air Pollution and Heat Islands](http://wps.prenhall.com/esm_aguado_uwac_3/11/2882/737896.cw/index.html) |
| Week fifteen, 12/6 | Global Climate, Climate Variability and Climate Change |
| Week sixteen, 12/13 | Final Projects  Student Presentation |

**Final project**

Weather and climate related final presentations and final term papers are encouraged.

**Grading**

* Attendance 10%
* Homeworks 20%
* Midterm 30%
* Final Project 40%

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

**Textbooks**

## “Understanding Weather and Climate” by Edward Aguado and James E. Burt, 7th Edition, 2015, ISBN13: 978-0321987303, PEARSON.

Impacts of severe weather on economy

Numerical Weather Models and Forecasting

Ocean?

**Useful Links**

* 1. [NOAA/CDC](http://www.cdc.noaa.gov/)
  2. [NOAA/NCDC](http://www.ncdc.noaa.gov/oa/ncdc.html)
  3. [IPCC](http://www.ipcc.ch/)
  4. [Climate Conference in Copenhagen, 2009](http://www.erantis.com/events/denmark/copenhagen/climate-conference-2009/index.htm)
  5. [Global Climate Change Impacts in the United States](http://globalchange.gov/us-impacts/)
  6. [Climate Change Science Compendium 2009 by UNEP](http://www.unep.org/compendium2009/)
  7. [IPCC 2007 Reports](http://www.usgcrp.gov/usgcrp/links/ipcc.htm)
  8. [A climate threat, rising from the soil](http://www.washingtonpost.com/wp-dyn/content/article/2009/11/18/AR2009111804162.html?hpid=artslot)