

**GEORGE MASON UNIVERSITY  
COLLEGE OF SCIENCE**

**GGG 121 – Dynamic Atmosphere/Hydrosphere  
Fall - 2017**

**Syllabus**

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**Instructor:**

**Name:** Dr. Paul R. Houser

**Email:** [phouser@gmu.edu](mailto:phouser@gmu.edu) (preferred method of communication)

**Phone:** (301) 613-3782

**Office Hours: In Person:** Exploratory 2209; Wednesdays 4-6pm or by appointment

**Virtual:** Email, Phone, Skype (prhouser),

I am generally available Monday at 9 am to Friday at 5 pm for student inquiries. During this 5 day period, I will respond to student inquiries within 24 hours.

### **Course Description:**

This natural science lab course is a systematic study of Weather, Climate, Energy, and Hydrologic Systems and their relationship to global and environmental change, viewed from a geo-spatial and global perspective. We will study the spatial distribution and relationships of earth's climate and hydrologic systems to other earth systems and the processes driving and changing them, including energy, climate, weather, and water resources. This course is a core course for the BS in Global and Environmental Change Major, and is open to any student. There are no prerequisites.

### **Laboratory:**

This class has a mandatory laboratory session, where students will complete a series of laboratories. One combined grade will be assigned for the lab and course.

### **Course Prerequisites:**

None.

### **Goals:**

Why do we study the global distribution of weather and water? To understand the spatial variation of climate, weather, and water; to understand how atmospheric processes create global and regional climate and hydrologic variation and weather activity; to understand the connection between the spatial distribution and processes of energy, moisture, gases, chemistry, and motion in our atmosphere and hydrosphere and how that drives other earth systems and influences their global distribution; to understand the importance of our atmospheric system in maintaining the delicate balance of physical and biological systems on earth and the interconnectedness of the Atmosphere, the Hydrosphere, the Biosphere, and the Geosphere; and to understand how these interconnected processes respond to global scale change, and human impact and response to these natural systems.

Through the lecture and lab projects, the students will learn the critical approach of the scientific method, to relate theory and experiment, become skilled at the use of quantitative and qualitative information, and will learn about the development and elaboration of major ideas in atmospheric and hydrologic science such as the global atmospheric and ocean circulation models, Earth's energy budget model, and the hydrologic cycle. Students will be assessed through a series of graded laboratory projects and exams.

### **Course Expectations:**

1. Working online requires dedication and organization. Proper preparation is expected every week. You are expected to log in to the course on a **daily** basis and complete the assignments and activities on or before the due dates.
2. Students must check their GMU email messages on a **daily** basis for course announcements, which may include reminders, revisions, and updates.

3. It is expected that you will familiarize yourself with and adhere to the [Honor Code](#). Student members of the George Mason University community pledge not to cheat, plagiarize, steal, and/or lie in matters related to academic work.
4. It is essential to communicate any questions or problems to me promptly.

### **Online Learning Community:**

This online course is taught via Blackboard Courses (Log into <http://mymason.gmu.edu>, select the Courses Tab, and the course can be found in the Course List).

This course is offered completely online, and is asynchronous (meaning there are no live sessions). Each week begins on Monday and ends on Friday. The laboratory is a major part of this course, requiring weekly work sessions.

In our online learning community, we must be respectful of one another. Please be aware that innocent remarks can be easily misconstrued. Sarcasm and humor can be easily taken out of context. When communicating, please be positive and diplomatic. I encourage you to learn more about [Netiquette](#).

### **Technology Requirements:**

**The technology requirements for this online course are listed below:**

#### **Hardware:**

You will need access to a Windows or Macintosh computer with at least 2 GB of RAM and to a fast, reliable broadband Internet connection (e.g., cable, DSL, 4G). For optimum visibility of course material, the recommended computer monitor and laptop screen size is 13-inches or larger. You will need computer speakers or headphones to listen to recorded content. A headset microphone is recommended for recording your project presentations. For the amount of computer hard disk space required to take an online course, consider and allow for the space needed to: 1) install the required and recommended software and, 2) save your course assignments.

For hardware and software purchases, visit [Patriot Computers](#).

#### **Software:**

Web browser (See [Blackboard Support](#) for supported web browsers)

Blackboard Courses (Log into <http://mymason.gmu.edu>, select the Courses Tab)

Adobe Acrobat Reader ([free download](#))

Flash Player ([free download](#))

Microsoft Office ([purchase](#))

**Note:** If you are using an employer-provided computer or corporate office for class attendance, please verify with your systems administrators that you will be able to install the necessary applications and that system or corporate firewalls do not block access to any sites or media types.

### **Learning Outcomes:**

At the end of this course, students will be able to:

- **LECTURE:**
  - Understand how scientific inquiry is based on investigation of evidence from the natural world.
  - Recognize the scope and limits of science.
  - Recognize and articulate the relationship between the natural sciences and society (e.g. sustainability, global warming).
  - Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information)
- **LAB:**
  - Participate in scientific inquiry and communicate the elements of the process, including:
    - Making careful and systematic observations
    - Developing and testing a hypothesis
    - Analyzing evidence
    - Interpreting results

### **Required Text:**

1. ***Exercises for Weather & Climate***, 8/E Carbone, 2013 ([eTextbook](#) \$36.99)

2. ***Understanding Weather and Climate***, 7/E Aguado & Burt, 2015

***\*\*get a eTEXT version with MasteringMeteorology access – this is best done through blackboard (\$72.90):***

- a. Enter your Blackboard course.
- b. Click Tools in the left navigation bar.
- c. Click Pearson's MyLab and Mastering on the Tools page. The Pearson's MyLab and Mastering page is now displayed. The top area of the page lists the links into the MyLab and Mastering course. The lower area displays the course's Support Tools.
- d. Click any course link in the top area of the page. The End-User License Agreement and Privacy Policy is displayed.
- e. Continue with the procedure in 2. Register and pay for your Pearson course.

NOTE that you can get temporary access for 14 days.

### **Performance-based Assessments:**

#### **1. On-line Discussions:**

There are two on-line class discussions, and the general knowledge café discussion. Discussions will open on Blackboard on Sunday at 6 a.m. EST. Submit your initial posts no later than Tuesday before midnight EST. Read your classmates' posts and reply to two of them between Tuesday and

Thursday before midnight EST. See the Discussion Rubric.

**2. Session Quizzes:**

Session quizzes will assess student progress toward learning objectives. At the end of each session, students will be presented with random questions (selected from a larger database of questions), and will have 10min to present their answers. Students are expected to do their own work.

**3. Activities:**

Two homework activities will be assigned during the course to hone student skills. Assignments will be submitted in PDF format.

**4. Lab Assignments:**

Laboratories will be assigned on a session basis to hone student skills. Assignments will be submitted in PDF format.

**Grading:**

Students will be evaluated in the following areas:

- **Discussions (12%)**
  - Discussion 1 – 4 points (1 point for each thoughtful/useful post)
  - Discussion 2 – 4 points (1 point for each thoughtful/useful post)
  - Knowledge Café – 4 points (1 point for each thoughtful/useful post)
- **Activities (8%)**
  - 2 activity assignments at 4 points each
- **Quizzes (28%)**
  - 14 quizzes at 2 points each
- **Laboratories (52%)**
  - 13 laboratories at 4 points each

Grades are assigned using a ten point scale (+/- grades determined at instructor discretion):

A= 90 – 100 B = 80 – 89.9 C= 70 – 79.9 D= 60 – 69.9 F= 0 – 59.94

**A combined course-lab grade will be assessed.**

Learning Module	Readings	eMaterials	Assessments (due at session end)
<b>Session1:</b> Aug 28-Sep 1 <ul style="list-style-type: none"> <li>• Course Welcome</li> <li>• Composition and Structure</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Course Welcome in Blackboard</b> About the Instructor and Getting Started</li> <li>• <b>TextBook:</b> Ch 1</li> <li>• <b>LabBook:</b> Ch 1</li> </ul>	<ul style="list-style-type: none"> <li>• Orientation</li> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Contact instructor if you are experiencing any difficulties in accessing course content</i></li> <li>• <b>Student Intro: Submit</b> Blog Post</li> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> </ul>
<b>Session2:</b> Sep 4-8 <ul style="list-style-type: none"> <li>• Solar Radiation</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b> Ch 2</li> <li>• <b>LabBook:</b> Ch 2</li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> </ul>
<b>Session3:</b> Sep 11-15 <ul style="list-style-type: none"> <li>• Energy Balance</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b> Ch 3</li> <li>• <b>LabBook:</b> Ch 3</li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> <li>• <b>Homework 1</b> (due 1 week after session)</li> </ul>
<b>Session4:</b> Sep 18-22 <ul style="list-style-type: none"> <li>• Atmospheric Pressure</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b>Ch 4</li> <li>• <b>LabBook:</b> Ch 4</li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> <li>• <b>Discussion 1</b> (due 1 week after session)</li> </ul>
<b>Session 5:</b> Sep 25-Sep 29 <ul style="list-style-type: none"> <li>• Atmospheric Moisture</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b>Ch 5</li> <li>• <b>LabBook:</b> Ch 5</li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> </ul>
<b>Session6:</b> Oct 2-6 <ul style="list-style-type: none"> <li>• Clouds</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b>Ch 6</li> <li>• <b>LabBook:</b> Ch 6</li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> </ul>
<b>Session7:</b> Oct 9-13 <ul style="list-style-type: none"> <li>• Precipitation</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b> Ch 7</li> <li>• <b>LabBook:</b> Ch 7</li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> </ul>
<b>Session8:</b> Oct 16-20 <ul style="list-style-type: none"> <li>• Atmospheric Circulation</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b> Ch 8</li> <li>• <b>LabBook:</b> Ch 8</li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> <li>• <b>Homework 2</b> (due 1 week after session)</li> </ul>
<b>Session9:</b> Oct 23-27 <ul style="list-style-type: none"> <li>• Air Masses &amp; Fronts</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b> Ch 9</li> <li>• <b>LabBook:</b> Ch 9</li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> <li>• <b>Discussion 2</b> (due 1 week after session)</li> </ul>
<b>Session10:</b> Oct 30-Nov 3 <ul style="list-style-type: none"> <li>• Mid-Latitude Cyclones</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b> Ch 10</li> <li>• <b>LabBook:</b> Ch 10</li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> </ul>
<b>Session11:</b> Nov 6-10 <ul style="list-style-type: none"> <li>• Lightning &amp; Tornadoes</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b> Ch 11</li> <li>• <b>LabBook:</b> <b>Ch 12</b></li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> </ul>
<b>Session12:</b> Nov 13-17 <ul style="list-style-type: none"> <li>• Tropical Storms</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b> Ch 12</li> <li>• <b>LabBook:</b> <b>Ch 13</b></li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> </ul>
<b>Session13:</b> Nov 27-Dec 1 <ul style="list-style-type: none"> <li>• Weather Forecasting</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b> Ch 13</li> <li>• <b>LabBook:</b> <b>Ch 11</b></li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> <li>• Lab</li> </ul>
<b>Session14:</b> Dec 4-8 <ul style="list-style-type: none"> <li>• Human Effects</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Textbook:</b> Ch 14</li> </ul>	<ul style="list-style-type: none"> <li>• Videos/PPT</li> <li>• Pearson Mastering</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Quiz</b> (10min, 2 questions)</li> </ul>

## **Student Expectations:**

### **Academic Integrity**

Students must be responsible for their own work, and students and faculty must take on the responsibility of dealing explicitly with violations. The tenet must be a foundation of our university culture. [See <http://academicintegrity.gmu.edu/distance/>].

### **Honor Code**

Students must adhere to the guidelines of the George Mason University Honor Code [See <http://oai.gmu.edu/honor-code/masons-honor-code/>].

### **MasonLive/Email (GMU Email)**

Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account. [See <https://thanatos.gmu.edu/masonlive/login/>].

### **Patriot Pass**

Once you sign up for your Patriot Pass, your passwords will be synchronized, and you will use your Patriot Pass username and password to log in to the following systems: Blackboard, University Libraries, MasonLive, myMason, Patriot Web, Virtual Computing Lab, and WEMS. [See <https://thanatos.gmu.edu/passwordchange/index.jsp>].

### **University Policies**

Students must follow the university policies. [See <http://universitypolicy.gmu.edu>].

### **Responsible Use of Computing**

Students must follow the university policy for Responsible Use of Computing. [See <http://universitypolicy.gmu.edu/1301gen.html>].

### **University Calendar**

Students must follow the university policies. [See <http://catalog.gmu.edu>].

### **Students with Disabilities**

Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See <http://ods.gmu.edu>].

### **Religious Holidays**

A list of religious holidays is available on the University Life Calendar page (<http://ulife.gmu.edu/calendar/religious-holiday-calendar/>). Any student whose religious observance

conflicts with a scheduled course activity must contact the Instructor at least 2 weeks in advance of the conflict date in order to make alternative arrangements.

**Students are expected to follow courteous Internet etiquette.**

## **Student Services:**

### **University Libraries**

University Libraries provides resources for distance students. [See <http://library.gmu.edu/distance>].

### **Writing Center**

The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. [See <http://writingcenter.gmu.edu>]. You can now sign up for an Online Writing Lab (OWL) session just like you sign up for a face-to-face session in the Writing Center, which means YOU set the date and time of the appointment! Learn more about the [Online Writing Lab \(OWL\)](#) (found under Online Tutoring).

### **Counseling and Psychological Services**

The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance [See <http://caps.gmu.edu>].

### **Family Educational Rights and Privacy Act (FERPA)**

The Family Educational Rights and Privacy Act of 1974 (FERPA), also known as the "Buckley Amendment," is a federal law that gives protection to student educational records and provides students with certain rights. [See <http://registrar.gmu.edu/privacy>].