Geography 301K - Weather and Climate (Unique #84655)
First Summer Semester 2011

LOCATION AND TIME: GRG102, TuTh 11:30am to 12:45pm

INSTRUCTOR: Troy Kimmel, Senior Lecturer CV BIO (Email: tkimmel@mail.utexas.edu)
TEACHING ASSISTANT: Chris Ulack (Email: culack@mail.utexas.edu)
OFFICE: Geography Building (Northeast corner of 24th Street and Whitis Avenue), Room 340
OFFICE HOURS: M-Th 10:45 to 11:30am / other times by appointment
PHONES: Home Office 335-6472 (At times other than office hours)
        UT Office 232-1590 (Office hours only), UT Geography Switchboard 471-5116

CLASS OBJECTIVES:
Our study of weather and climate is intended for Geography majors and all others interested in a broad brush examination of the atmospheric and climatic sciences. This study will be introductory in nature with only a very basic use of mathematics. We will start with a study of meteorology. From this foundation, we will go into the different aspects of the atmosphere and then, later, into climatological matters and discuss the various climatic regimes including that of Texas and the local area.

ATTENDANCE:
While this is probably not going to be the hardest course you’ve ever taken (or will take) in your college career, it is intensive. This is due, primarily, to the amount of material to be covered during the semester. It is, therefore, my philosophy that your success in this course will vary directly with your class attendance. Be aware of the fact that attendance will be taken on a daily basis and this information will be used in the computation of your final class grade. Excessive absences will work against you while perfect attendance can help you to the next highest letter grade in borderline situations at the end of the semester.
Our class time is 11:30am to 12:45pm Monday through Friday. Promptness is expected; you should make every effort to be in the classroom by 11:30am. Late arrivals are an interruption to the class material being presented and are unfair to your fellow students that have made the effort to be on time.

GRADING PROCEDURE:
Your final grade will be determined by your numerical performance on the examinations as noted (ALL dates, as indicated on outline, are TENTATIVE and are SUBJECT TO CHANGE):

<table>
<thead>
<tr>
<th>Examination</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination #1</td>
<td>200</td>
</tr>
<tr>
<td>Examination #2</td>
<td>200</td>
</tr>
<tr>
<td>Examination #3</td>
<td>200</td>
</tr>
<tr>
<td>Place Name Exam</td>
<td>50</td>
</tr>
<tr>
<td>Examination #4</td>
<td>200</td>
</tr>
<tr>
<td>Attendance Pop Quizzes/Exercises</td>
<td>50</td>
</tr>
<tr>
<td>Final Cumulative Exam</td>
<td>300</td>
</tr>
</tbody>
</table>

Only three of the regular examination scores will count; the lowest of the four grades will be dropped (see MAKE-UP EXAMINATIONS). All numerical scores will be added together to arrive at a possible 1000 points at the end of the semester, where, when utilizing the UT “Plus” / “Minus” Final Grade Grading System and applying it to our 1000 point grading system...

900-933 = A- (GPA earned 3.67), 934-1000 = A (GPA earned 4.0)
800-833 = B- (GPA earned 2.67), 834-866 = B (GPA earned 3.0), 867-899 = B+ (GPA earned 3.33)
700-733 = C- (GPA earned 1.67), 734-766 = C (GPA earned 2.0), 767-799 = C+ (GPA earned 2.33)
600-633 = D- (GPA earned 0.67), 634-666 = D (GPA earned 1.0), 767-799 = D+ (GPA earned 1.33)
0-599 = F (GPA earned 0.00)

All examinations will be objective (multiple choice). If you have a question regarding your exams, it is your responsibility to visit during office hours when we will access your copy of the exam. Any questions regarding exams will be brought forth within one week of the exam return date otherwise the grade is considered final.
TEXTBOOK MATERIAL:
We will utilize the following textbook during the semester:
Essentials of Meteorology (6th Edition) - C. Donald Ahrens - Required (Thomson Learning)
Goode's World Atlas (22nd Edition) - Recommended (Rand McNally)

These books are available at the University Coop and other campus bookstores as well through on-line textbook web sites. Please shop around for the best price.

Here are some additional on-line links that will be useful in class:
- METARS / Surface Weather Observations Tutorial (METAR Decoding Exercise)
- NCAR / World Wide Location Identifier List (NWS Location ID Query System)
- Kimmel’s Cloud / Precipitation Types Tutorial (On Line Learning Module)
- Kimmel’s Severe and Unusual Weather Tutorial (On Line Learning Module)
- Koppen Climate Classification Flow Chart

NCDC / Local Annual LCD Documents in PDF
Texas Climate Normals 1971-2000
Austin Bergstrom Intl Airport (ID: KAUS):
Austin City (Camp Mabry) (ID: KATT):

MAKE-UP EXAMINATIONS:
There will be NO make-up "weekly" examinations under ANY CIRCUMSTANCES. It's precisely for the reasons of sickness and other unplanned absences as well as for the occasional "bad" test day that I allow your lowest "weekly" examination score to be dropped. Please note that you are required to take the final exam on the date and time as specified by the University (no excused absences).

EXAMINATION DAYS:
In order to ensure honesty in the classroom (and given the class size for this particular class and section), please note that I have set guidelines in reference to examination days:
# Beginning with the handout of the examinations, I expect silence
# All material that you bring with you on examination day will be placed on the floor under your seat
# No headwear (caps, hats) will be worn while in our classroom on examination days
# Once the examination is distributed, there will be no leaving the classroom for any reason.

UNIVERSITY OF TEXAS / POLICY ON SCHOLASTIC DISHONESTY:
In this class, there is zero tolerance for students who violate university rules on scholastic dishonesty with all suspected cases turned over to the University’s Dean of Students office. Penalties for scholastic including possibility of failure of course and dismissal from the University. Since dishonesty harms the individual, fellow students and the integrity of the University, policies on scholastic dishonesty will be STRICTLY ENFORCED in this class.

AMERICANS WITH DISABILITIES ACT (ADA):
The University of Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Division of Diversity and Community Engagement, Services for Students with Disabilities at 471-6259, 471-6441 TTY, 866-329-3986 video phone.

If you have documentation regarding accommodations from the Dean of Students office, you must meet with me, in person and during office hours, as early as possible in the semester to discuss exact accommodations. When you come to this meeting, you will be required to provide written documentation from the Services for Students with Disabilities.
CLASSROOM / CAMPUS EMERGENCY ACTION PLANS:
The status of University of Texas campus activities in times of emergency (i.e., severe/inclement weather) along with some important procedures in case of emergencies on our campus as well as in our classrooms can always be found on the University of Texas Emergency Web Page. The University of Texas maintains Emergency Action Plans that addresses emergencies that could potentially affect the our community. You can reference the various plans here. Our UT Siren System is used in times of emergencies when it is necessary for you to "shelter in place" in campus buildings (remain in or go to the nearest building on campus when the siren is activated and remain there until the "all clear" is given). The UT Siren System, as part of policy, is tested monthly on the first Wednesday of every month between 11:50 am and 12:00 noon. Please don't take the siren system tests for granted; be ready to take action if the siren system is activated! We will discuss, during the first class day of the session, our emergency plan for our specific classroom in case of fire, severe/inclement weather and other different situations. Please take this discussion seriously and ask any questions that you may have!!

UT POLICY ON EMAIL NOTIFICATION
Instructor to student email is a recognized and accepted form of official communication here at the University of Texas. For the University policy, read this. It is critically important that (1) you make sure to have your current and most frequently checked email address on file in UT Direct and (2) you check it on a daily basis. I will send class email frequently during the semester and you'll be given updates and change notices in references to lectures as well as exams.
## GRG301K Class Notes - Outline

<table>
<thead>
<tr>
<th>DATE</th>
<th>SUBJECT MATTER</th>
<th>TEXT CHAPTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 Jun</td>
<td>Introduction to Weather, Climate and the Atmosphere</td>
<td>Ch 1</td>
</tr>
<tr>
<td>6 Jun</td>
<td>Earth-Sun Relationship; Heat Transfer &amp; Balance; Greenhouse Effect,</td>
<td>Ch 2, 3</td>
</tr>
<tr>
<td></td>
<td>Energy Balance</td>
<td></td>
</tr>
<tr>
<td>7 Jun</td>
<td>Latent Heat, Latitudinal Heat Balance; Heat and Temperature;</td>
<td>Ch 3</td>
</tr>
<tr>
<td></td>
<td>Temperature Scales, Data, Uses</td>
<td></td>
</tr>
<tr>
<td>8 Jun</td>
<td>Moisture, Moisture Measurements; Atmospheric Stability; Dew/Frost;</td>
<td>Ch 4, 5</td>
</tr>
<tr>
<td></td>
<td>Cloud Formation; Fogs Types and Formation</td>
<td></td>
</tr>
<tr>
<td>9 Jun</td>
<td>Cloud Classification, Types/Features; Precipitation Formation/Types</td>
<td>Ch 5</td>
</tr>
</tbody>
</table>

**EXAMINATION #1 (Covers in class lecture material roughly pertaining to chapters 1 through 6)**

<table>
<thead>
<tr>
<th>DATE</th>
<th>SUBJECT MATTER</th>
<th>TEXT CHAPTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-14 Jun</td>
<td>Atmospheric Pressure; Pressure Readings;</td>
<td>Ch 6</td>
</tr>
<tr>
<td></td>
<td>The &quot;Standard&quot; Atmosphere; Global Scale/Upper Level Winds;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forces at Work; Wind Measurement</td>
<td></td>
</tr>
<tr>
<td>15 Jun</td>
<td>General Air Circulation; Jet Streams, El Nino/La Nina/ENSO;</td>
<td>Ch 7, 8</td>
</tr>
<tr>
<td></td>
<td>Local Scale Winds; Airmasses; Weather Patterns; Cyclogenesis</td>
<td></td>
</tr>
<tr>
<td>16-17 Jun</td>
<td>High and Low Pressure Areas; Fronts and Associated Weather</td>
<td>Ch 8</td>
</tr>
<tr>
<td>20 Jun</td>
<td>Weather Forecasting</td>
<td>Ch 9</td>
</tr>
</tbody>
</table>

**EXAMINATION #2 (Covers in class lecture material roughly pertaining to chapters 6 through 9)**

<table>
<thead>
<tr>
<th>DATE</th>
<th>SUBJECT MATTER</th>
<th>TEXT CHAPTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>22-24 Jun</td>
<td>Introduction to Thunderstorms; Thunderstorm Hazards - Lightning, Hail, Flash</td>
<td>Ch 10</td>
</tr>
<tr>
<td></td>
<td>Floods</td>
<td></td>
</tr>
<tr>
<td>27 Jun</td>
<td>Severe Thunderstorms</td>
<td>Ch 10</td>
</tr>
<tr>
<td>28 Jun</td>
<td>Tornadoes</td>
<td>Ch 10</td>
</tr>
<tr>
<td>29 Jun</td>
<td>Tropical Meteorology</td>
<td>Ch 11</td>
</tr>
</tbody>
</table>

**EXAMINATION #3 (Covers in class lecture material roughly pertaining to chapters 10 and 11)**

<table>
<thead>
<tr>
<th>DATE</th>
<th>SUBJECT MATTER</th>
<th>TEXT CHAPTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Jul</td>
<td>Introduction to Climatology and Climate Classification</td>
<td>Ch 13</td>
</tr>
<tr>
<td>5 Jul</td>
<td>Koppen Climate Types A (Tropical) and B (Arid)</td>
<td>Ch 13</td>
</tr>
<tr>
<td></td>
<td>Koppen Climate Types C (Subtropical) and D (Temperate)</td>
<td>Ch 13</td>
</tr>
<tr>
<td></td>
<td>Koppen Climate Types E (Polar) and H (Highland)</td>
<td>Ch 13</td>
</tr>
<tr>
<td>6 Jul</td>
<td>US/Texas/Austin Climate</td>
<td>Ch 14</td>
</tr>
<tr>
<td></td>
<td>Climate Change</td>
<td>Ch 14</td>
</tr>
</tbody>
</table>

**EXAMINATION #4 (Covers in class lecture material roughly pertaining to chapters 13 and 14)**

<table>
<thead>
<tr>
<th>DATE</th>
<th>SUBJECT MATTER</th>
<th>TEXT CHAPTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fri/8 Jul</td>
<td>FINAL GRG301K CUMULATIVE EXAMINATION (2 - 5 pm) - REQUIRED</td>
<td></td>
</tr>
</tbody>
</table>
This is a list of geographic locations of which all graduating high school and college students should be aware. Put your atlas skills to work by using your Goode’s World Atlas (strongly recommended), get to know the actual locations of each place listed here.

### GLOBAL SCALE FEATURES

- Equator
- Arctic Circle
- South Pole
- Tropic of Cancer
- Antarctic Circle
- Prime Meridian
- Tropic of Capricorn
- North Pole
- International Date Line

### CONTINENTS

- Europe
- South America
- Australia
- Africa
- Asia
- North America
- Antarctica

### OCEANS

- Atlantic
- Arctic
- Pacific
- Indian

### SEAS, BAYS, GULFS, STRAITS, CHANNELS, PASSAGES, CANALS

- Mediterranean Sea
- Black Sea
- Arabian Sea
- South China Sea
- Gulf of Mexico
- Strait of Florida
- Drake Passage
- North Sea
- Strait of Hormuz
- Strait of Gibraltar
- Suez Canal
- Persian/Arabian Gulf
- Gulf of Alaska
- Caribbean Sea
- Windward Passage
- Cape of Good Hope
- Yucatán Channel
- Prince William Sound
- Dardanelles
- Red Sea
- Bay of Bengal
- Hudson Bay
- Panama Canal
- Strait of Magellan
- Cape Horn
- Bering Sea

### MAJOR ISLANDS AND ISLAND GROUPS

- Greenland
- Lesser Antilles
- Cyprus
- New Guinea
- Aleutian Islands
- Azores
- Bermuda
- Philippines
- Iceland
- British Isles
- Sicily
- Taiwan
- Hawaiian Islands
- Canary Islands
- Trinidad
- Seychelles
- Greater Antilles
- Madagascar
- Borneo
- Japan
- New Zealand
- Bahama Islands
- Windward Islands

### OCEAN CURRENTS

- North Equatorial Current
- Gulf Stream
- East Brazil Current
- Alaska Current
- Equatorial Counter Current
- Labrador Current
- Japan (Kuroshio) Current
- Peru (Humboldt) Current
- South Equatorial Current
- Canary Current
- California Current
- East Australian Current

### MAJOR MOUNTAIN RANGES, PLATEAUS AND BASINS

- Alps
- Brazilian Highlands
- Hindu Kush Mountains
- Congo Basin
- Iranian Plateau
- Andes Mountains
- Arabian Plateau
- Rocky Mountains
- Great Basin
- Atlas Mountains
- Himalayas
- Ural Mountains
- Amazon Basin
**DESERTS**

* Atacama  * Australian  * Gobi  
* Kalahari  * Patagonian  * Sahara  
* Mojave  * Sonora  * Chihuahua  

**PENINSULAS**

* Arabian  * Balkan  * Crimean  
* Florida  * Iberian  * Korean  
* Italian  * Indochina  * Indian  
* Scandinavian  * Yucatan  * Baja California  
* Labrador  * Palmer (Antarctic)  

**NORTH AMERICAN PHYSICAL FEATURES**

<table>
<thead>
<tr>
<th></th>
<th>Sierra Nevada</th>
<th>Sierra Madre Oriental</th>
<th>Sierra Madre Occidental</th>
</tr>
</thead>
</table>
| Appalachian Mountains | Alaska Range Brooks Range | Long Island  
| Baffin Island | Vancouver Island  
| Newfoundland | Gulf of St. Lawrence  
| James Bay * | Cape Hatteras  
| Tampa Bay | Chesapeake Bay  
| Long Island Sound | Grand Canyon  
| Lake Superior | Lake Michigan  
| Lake Erie | Lake Ontario  
| Lake Okeechobee | Columbia-Snake River  
| Fraser River | Colorado River (Southwest US)  
| Mississippi River | Missouri River  
| Ohio River | Tennessse River  
| Potomac River | Rio Grande River  
| Red River (Texas/Oklahoma) | Brazos River  

**CANADIAN PROVINCES**

* Price Edward Island  * Nova Scotia  * New Brunswick  
* Newfoundland  * Quebec  * Ontario  
* Manitoba  * Saskatchewan  * Alberta  
* British Columbia  

**CANADIAN TERRITORIES**

* Northwest Territories  * Yukon  * Nunavut  

**UNITED STATES**

* Know All Fifty States and the State Capital of Each  
* District of Columbia  
* Major Cities:  
  - New York City  | Chicago  | Los Angeles  
  - San Francisco  | Seattle  | Dallas/Fort Worth  
  - Miami  | Boston  | Washington DC  
  - Houston  | St Louis  | New Orleans  
  - Minneapolis/St. Paul  | Denver  | Memphis  
  - Atlanta  | Miami  | Detroit  

**MEXICO**

* Know That it Consists of 31 States and Federal District of Mexico City  
* Know Locations of the U.S./Mexico Border States:  
  - Sonora  | Chihuahua  | Coahuila  
  - Nuevo Leon  | Tamaulipas  

**CENTRAL AMERICAN REGION**

* Belize  * Guatemala  * El Salvador  
* Honduras  * Nicaragua  * Costa Rica  
* Panama  

<table>
<thead>
<tr>
<th>Region</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caribbean Region</td>
<td>Puerto Rico, U. S. Virgin Islands, Cuba</td>
</tr>
<tr>
<td></td>
<td>Haiti, Dominican Republic, Jamaica</td>
</tr>
<tr>
<td>South American Region</td>
<td>Colombia, Venezuela, Guyana, Ecuador</td>
</tr>
<tr>
<td></td>
<td>Suriname, French Guiana, Brazil, Bolivia</td>
</tr>
<tr>
<td></td>
<td>Peru, Chile, Paraguay, Argentina</td>
</tr>
<tr>
<td></td>
<td>Dominican Republic, Brazil, Paraguay, Argentina</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>England, Wales, Scotland</td>
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<tr>
<td></td>
<td>Northern Ireland</td>
</tr>
<tr>
<td>Europe</td>
<td>Finland, Sweden, Norway, Belgium</td>
</tr>
<tr>
<td></td>
<td>Denmark, Iceland, Republic of Ireland, Hungary</td>
</tr>
<tr>
<td></td>
<td>France, Luxembourg, Portugal, Malta</td>
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<tr>
<td></td>
<td>Austria, Spain, Greece, Hungary, Serbia</td>
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<tr>
<td></td>
<td>Italy, Poland, Bulgaria, Bulgaria</td>
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<tr>
<td></td>
<td>European Turkey, Croatia, Herzegovina</td>
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<tr>
<td></td>
<td>Czech Republic, Bosnia, Herzegovina</td>
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<tr>
<td></td>
<td>Republic of Macedonia, Montenegro, Albania</td>
</tr>
<tr>
<td>Southwestern Asia</td>
<td>Turkey, Syria, Lebanon, Yemen</td>
</tr>
<tr>
<td></td>
<td>Jordan, Saudi Arabia, Qatar, Iraq</td>
</tr>
<tr>
<td></td>
<td>Oman, United Arab Emirates, Iraq</td>
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<td></td>
<td>Bahrain, Kuwait, Iran</td>
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<tr>
<td></td>
<td>Israel</td>
</tr>
<tr>
<td>Southern Asia</td>
<td>Pakistan, India, Bangladesh, Nepal</td>
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<tr>
<td></td>
<td>Sri Lanka, Myanmar / Burma, Nepal</td>
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<tr>
<td></td>
<td>Bhutan</td>
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<tr>
<td>Southeastern Asia</td>
<td>Thailand, Laos, Vietnam, Brunei</td>
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<td></td>
<td>Cambodia, Malaysia, Philippines</td>
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<tr>
<td></td>
<td>Indonesia</td>
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<tr>
<td>East and Interior Asia</td>
<td>People's Republic of China (Mainland),</td>
</tr>
<tr>
<td></td>
<td>People's Republic of Mongolia</td>
</tr>
<tr>
<td></td>
<td>Democratic People's Republic of Korea (North</td>
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<tr>
<td></td>
<td>Korea), Republic of Korea (South Korea)</td>
</tr>
<tr>
<td>Northern Africa</td>
<td>Morocco, Algeria, Tunisia</td>
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<tr>
<td></td>
<td>Libya, Egypt</td>
</tr>
<tr>
<td></td>
<td>Algeria, Egypt</td>
</tr>
<tr>
<td>Saharan Africa</td>
<td>Mauritania, Mali, Niger</td>
</tr>
<tr>
<td></td>
<td>Chad, Sudan</td>
</tr>
<tr>
<td></td>
<td>Mali, Sudan</td>
</tr>
<tr>
<td></td>
<td>Mauritania, Mali, Niger</td>
</tr>
<tr>
<td></td>
<td>Chad, Sudan</td>
</tr>
</tbody>
</table>
### Western Africa
- Gambia
- Guinea-Bissau
- Ghana
- Benin
- Sierra Leone
- Senegal
- Liberia
- Burkina Faso
- Nigeria
- Guinea
- Ivory Coast (Cote D’ivoire)
- Togo
- Cameroon

### Equatorial / Central Africa
- Central African Republic
- Congo Republic
- Central African Republic
- Equatorial Guinea
- Democratic Republic of Congo (Zaire)
- Gabon

### Eastern Africa
- Ethiopia
- Uganda
- Tanzania
- Somalia
- Rwanda
- Djibouti
- Kenya
- Burundi
- Eritrea

### Southern Africa
- Angola
- Botswana
- Swaziland
- Namibia
- Zambia
- Zimbabwe
- Lesotho
- Malawi
- Mozambique
- Republic of South Africa

### Russian Federation
- Russia
- Azerbaijan
- Kazakhstan
- Tadzhikistan
- Estonia
- Ukraine
- Belarus
- Kyrgyzstan
- Turkmenistan
- Latvia
- Armenia
- Georgia
- Moldavia
- Uzbekistan
- Lithuania

### Australia
- Australian Capital District
- Queensland
- South Australia
- Western Australia
- New South Wales
- Tasmania
- Victoria
- Northern Territory

### Oceania
- Polynesia (Area Inside a Triangular Line That Connects Hawaiian Islands)
- Easter Island and New Zealand - Means "Many Islands."
- Micronesia (North & West of Polynesia - Means "Small Islands."
- Melanesia (Narrow Area West of Polynesia - Means "Black Islands,"
  Which Mainly Refers to the Color of the Inhabitants of These Islands)

Last updated 01/15/2011  tmk