

Nassau Community College
Physical Sciences a division of the Math/IT/CS Department
MET 101 B++ - Introduction to Meteorology/Weather - CRN 41662 (Synchronous-Hybrid Online)
Spring 2024

Professor: Gregory Lehenbauer

Email Address: Gregory.Lehenbauer@ncc.edu

Meeting Times: **Lecture:** Online via D2L/Brightspace in Lecture Content Widget/Module
 Lab: Mon and Wed 8:00-9:15AM on Zoom Meeting ID: 976 4490 0251

Office: Remote on Zoom Meeting ID: 972 0059 6070 On Campus: Life Sciences 248

Office Hours: Mon 930-1045AM (Zoom) and Wed 12:00-1:15PM

Course Website: This document and other helpful lecture and lab information can be found on the professors web site for MET 101:

<https://facultywebsites.ncc.edu/faculty/SCI/lehenbg/met101.html>

This web site will also be especially helpful for those experiencing difficulty with some of the labs as it provides a way for students to obtain additional practice in performing some of the concepts covered in lab. Those labs preceded with an asterisk (*) on the lab outline on page 7 have additional help available on the above website.

Textbook: Aguado, Edward and J. E. Burt, *Understanding Weather & Climate*, 7th Edition (6th, 5th, 4th also allowed) It is mandatory to obtain the textbook. Do not buy the electronic version of the textbook/eBook. It is better to obtain a real hard copy version of the textbook. The newest edition is the 7th edition, but I highly recommend buying either the 4th, 5th or 6th edition for a much lower price on a textbook reselling website like Amazon.com. At the end of each chapter there is a list of **Key Terms**. These were the terms that were used and explained in the chapter. The first time the word was used in the chapter it was typed in **bold print**. Students who understand all of these terms tend to receive higher grades. One way to learn and understand these is to write out the terms and their definitions on a piece of paper or make flash cards.

Course Description:

To understand the daily and seasonal weather, students will be introduced to the basic weather elements such as temperature, atmospheric pressure, wind, humidity, precipitation and cloudiness. Real-time weather maps and forecast models from the internet are often used in class to enhance the study of particular topics. After a good foundation in the basic principles of meteorology, various atmospheric phenomena will be discussed, including the formation of rainbows, thunderstorms, lightning, tornadoes and hurricanes. Many of these phenomena are illustrated through video media. Laboratory exercises include the study of weather observations and radar images from the WSR-88D, analysis of surface maps, including the plotting the location of warm and cold fronts, upper-air maps, the analysis of soundings on Skew-T diagrams and weather forecasting.

Outcomes and Objectives

Educational Objectives:

Upon completion of this course:

1. The student will be able to apply basic concepts in meteorology and appraise their application to everyday situations.
2. The student will implement the scientific method through the concepts, observations, and physical laws as they apply to Meteorology.
3. The student will operate meteorological equipment in order to gather data and interpret results about meteorological phenomena.
4. The student will be able to evaluate variables (dependent and independent) in controlled experiments.
5. The student will be able to make viable, logical conclusions based upon experimental observations.
6. The students will be able to address, critique, and appraise misconceptions in Meteorology.
7. The student will be developing critical thinking skills in order to assess current developments in science

Student Learning Outcomes:

1. To instill a greater awareness of the complexity of the earth's atmosphere.
2. To develop an understanding of the effect of the atmosphere and its changes upon students' daily lives.
3. To understand the forces which cause or contribute to current weather conditions.
4. To develop a realization that observation of weather is a clue to future weather changes.
5. To develop an understanding of particular weather elements, e.g. temperature, pressure, humidity, state of sky, etc.
6. To understand the properties of water, and how water relates to weather.
7. To develop a visual skill in weather observation.
8. To develop skills in the use of various weather instruments for collection of weather data.
9. To develop skills in plotting and reading surface station model information.
10. To develop skills in analyzing observations and plotted data to include isotherms, isobars, high and low pressure centers, air masses, warm and cold fronts and areas of overcast skies, precipitation, thunderstorms and fog.
11. To develop a skill in preparing a simple weather map.
12. To develop a skill in preparing simple weather forecasts: A. without instruments and/or weather maps and using Buys' Ballot's Law and/or knowledge of cloud types. B. with instruments and/or weather maps.
13. To develop a skill in preparing upper level isobaric charts.
14. To develop an understanding of the development of severe weather phenomena.
15. To develop a skill in forecasting severe weather.
16. To develop an understanding of the precautions necessary for survival during severe storm events.

Attendance: Attendance is very important for the successful completion of any course. The attendance policies for the lab and lecture are different:

Lecture: The lecture portion of this course is self taught on-line with guidance from the professor in D2L/Brightspace. In your D2L/Brightspace course you will see a Table of Contents Widget called "Lecture Content". Here content will be opened by the professor, starting with Chapter 1, following the dates in the lecture course outline on page 8. Inside each chapter folder you will find lecture presentations using PowerPoint software, where my voice was embedded explaining the content of each slide. There are presentations for each lecture chapter that we are covering. Students are expected to watch, listen and take detailed thorough notes on these presentations (including the sketching of any charts/drawings/diagrams). You can go through these presentations at your own pace, stopping and starting the presentations based upon how quickly you can take notes. In addition to the presentations you will find homework questions to complete for each chapter. More information about these lecture homework questions can be found later on in this document.

Lab: The lab portion of this class is being taught live on Zoom. Attendance is mandatory and will be taken at the beginning of every lab day. As there are only 12 labs covered over 15 weeks, you are only allowed to miss one lab, after which three (3) percentage points will be deducted from the students final lab average for each additional lab missed, up to two (2) labs missed. If a student misses more than two (2) labs, without making up the work, he/she will receive an automatic grade of "F" or "WU", unless a student requests a withdrawal via the NCC Portal. This request may or may not be granted in accordance with the withdrawal policies discussed in this document. Lateness is also penalized as two (2) lateness' are equal to one (1) absence. If a student is late it is his/her responsibility to remind the professor after lab to change the attendance record from absent to late. Check with the professor if you are uncertain as to whether or not you will lose points or receive an "F" because of excessive lateness' and/or absences. Do not expect the professor to remember at a future class who arrived late the previous day or week.

An absence or lateness in lab can be made up/excused by completing a five step process: 1) Send me an email specifically asking what material/slides were covered on the day of your absence, 2) Watch/listen to the PowerPoint presentation(s) posted on D2L/Brightspace, for the notes that you missed, 3) as you watch/listen take complete handwritten detailed notes (including sketching any figures/charts) in your own notebook, 4) send me an email with an attached scan (PDF file) of the detailed notes that you took, and 5) upload the lab before the due date.

Attendance Extra Credit: A student who has perfect attendance during all lab sessions and is able to email me attached PDF scans of complete and thorough detailed notes they have taken for all lecture chapter and lab PowerPoint presentations, in separate lecture and lab notebooks, will have a five (5) percentage point bonus added to his/her overall final average. In order to get these 5 bonus points you will need to email me detailed scans of hand-written notes (that include sketches of all charts/drawings/diagrams presented) that you have taken on every lecture chapter and every lab prior to every major exam (3 exams in lecture and 2 exams in lab). As a student you should be doing this anyway in every class you register for, but in this case, in order to encourage your engagement in the course content, this extra credit is being offered. This may be very beneficial to those students who end up with for example a 84.5 average as the five additional points will raise the average to 89.5, which is then rounded up to a 90.0, which allows the student to get an A in MET 101.

Reviewing Zoom Lecture and Lab Presentations: Remember that I have posted PowerPoint presentations in D2L/Brightspace, for every lecture chapter and lab that we are covering in this course. These PowerPoint presentations include recordings of my voice teaching/explaining the material that was covered for that chapter or lab. In some cases I spend up to 3-4 minutes discussing/explaining/teaching a particular slide. This is exactly the same presentation of the material that you would have received if the class were being held on campus in a regular class/lab room. You can also use these PowerPoint presentation recordings to review what we did in lab, to remind you of how to complete the labs if you forgot how to accomplish a task, before they are due in the future. Make sure that you have Microsoft Office 365 - PowerPoint installed on your PC.

The Zoom Lab Room: When you use our classes Zoom Meeting ID to join the Zoom classroom each lab session, you will be entered into a waiting room. You need to make sure that you show/type in your actual full name as listed on the class roster. If you do not show your full name, you will not be allowed into the Zoom classroom. Once the professor starts the meeting you will be let into the Zoom classroom from the waiting room. You should join the waiting room a minimum of 5 minutes before the official class start time. Once you are let inside the Zoom classroom you will be muted. You should turn your camera on for the start of the days class session. You will be unmuted to say hello at the beginning of class. Once class begins you should mute yourself. You will also be able to use the “Raise Hand” feature in Zoom if you have a question. Do not speak on Zoom unless you are called on as when multiple people are speaking on Zoom, at the same time, no one can understand what anyone was saying. Once you are called on, you should unmute yourself to speak, and then remute yourself when you are done speaking.

Best Practices for Learning Remotely using Zoom: Students are expected to conduct themselves in a mature and responsible manner while in the Zoom classroom. Since March of 2020 faculty members across the US have learned various best practices, including the following items. Students should be sitting at a desk or a table while “actively participating”, not laying down in bed nor laying on a couch. Actively participating means taking detailed notes in a class notebook and participating by using the raise hand tool when the professor asks questions. While on Zoom you should be using a computer with a large screen like a desktop or laptop PC. It is impossible to learn on Zoom using your smartphone with its small screen as you will not be able to see the shared screen course content. Additionally all distractions should be away from you while you are learning in Zoom including other people in the room you’re in (you should try to find a room where you can be by yourself while on Zoom), music playing, tv on, pets and looking at other devices besides the device you are using for Zoom. One should not allow their cat or dog to be near them, distracting them, while participating on Zoom. Additionally, one should be fully dressed, including having a shirt on. It is also a best practice to have your camera on when the professor is not sharing his PC screen with you. This way the professor can see that you are actively participating.

Disruptive Behavior on Zoom: Anything that disturbs the learning of anyone else is considered harassment and will be dealt with accordingly. If you participate in any kind of distracting activity such as showing inappropriate things on your camera, not muting yourself, allowing noises/music/audio to be heard by others, using foul language or acting or speaking aggressively you will be removed from the Zoom meeting and reported to the Dean of Students. If you are removed from the session you can expect to meet with the Dean about your behavior and will be permanently removed from the class.

Submission of Work for Grading: All uploads into D2L/Brightspace of written assignments must be PDF format. Assignments, including the lecture HW and lab multiple choice questions, must be completed and submitted prior to 11:59 PM on the due dates found on page 7 and 8 of this document and also listed on the Calendar found on the right side of the MET 101 D2L/Brightspace page. Late assignments will not be accepted. You can not email assignments to me as there is no way to grade emailed work. It is important for professors to be able to leave comments on students work, circling things to draw your attention to the incorrect items, so that students can learn from their mistakes. The submission of work by students, with the professor providing effective feedback, is a great learning tool as it allows students to learn from their mistakes. Unfortunately submitting things by email does not allow this feedback process to occur making email a very ineffective way to submit work which is why you can not use email to submit your assignments. Email though is a very good way to ask questions about the various course assignments if you are confused by anything.

Calculator: A calculator is required for both lecture and laboratory. This should be next to you while on Zoom.

Materials to Buy: In addition to the mandatory textbook, you should obtain a set of colored pencils, a mechanical pencil to analyze weather maps in the lab and two separate notebooks, one for lecture notes and one for lab notes.

Cheating/Plagiarism: Cheating will not be tolerated this includes group work. **Group work is not allowed.** A student who is caught cheating will be dropped from the course immediately and reported to the Dean of Students. This may result in a student being dismissed from Nassau Community College, which will make it very difficult to transfer into a four-year school. There are no warnings or excuses. There are many ways for professors to detect that you worked together with another student on an assignment or project.

Grading: Students can and should track their grades on D2L/Brightspace. Your final grade will be an average calculated from your performance in the various aspects of the course. The lecture and laboratory* portions of the course are worth 50% each.

Lecture

Homework 15%
Quizzes 15%
Exams (3) 60%
Class Participation 10%

Lab*

Lab Reports 40%
Lab Quizzes 10%
Lab Midterm 25%
Lab Final 25%

* In theory would be possible to receive a failing grade in lab and a passing grade in lecture, and after the two grades are combined have a high enough grade to pass the course. However, since you are receiving laboratory science credit towards graduation for this course, in order to receive a passing grade for this course, a student must pass the laboratory portion of the class before a final overall average will be calculated.

Your final letter grade is based upon your overall average and is determined by NCC Policy:

90-100%	=	A	70-74%	=	C
85-89%	=	B+	65-69%	=	D+
80-84%	=	B	60-64%	=	D
75-79%	=	C+	Below 60%	=	F

Lecture Grade Component Information:

Lecture Exams/Final Exam: There will be two lecture exams based upon material from lecture as well as a Lecture Final Exam scheduled for the last day of class. Exams are an important and very serious part of this course as they make up 60% of your lecture grade. In general make up exams are not given, but it is understood that occasionally an emergency happens that prevents you from taking the exam at its scheduled time. If an emergency does happen, you must inform the professor of the emergency either **before or during** the scheduled exam time via email. Failure to inform the professor before or during the exam is an indication that you did not consider the exam to be an important event in your life and therefore **no make-up will be**

given. Any emergencies require documented proof of the emergency. However, there will be no make-up exam for the Final Exam. Once an exam date has been determined by the professor individual students should not ask for special permission to take the exam on a different date. The professor reserves the right to change previously announced exam dates due to school closure or other delays in covering course material. As this is a synchronous/remote course, the exams will be on D2L/Brightspace and a time limit will be set. The exams will be open and you can use your notes, textbook and D2L/Brightspace. The only thing you are not allowed to use is another person. Software maybe deployed to insure that you are not communicating (texting, talking etc...) with another person while you take an exam.

Lecture Quizzes: There will be several lecture quizzes given at various times during the semester covering the lecture PowerPoint presentations and the lecture homework questions. There will be no make-up quizzes. As this is a synchronous/remote course, the quizzes will be on D2L/Brightspace and a time limit will be set. The quizzes will be open and you can use your notes, textbook and D2L/Brightspace. The only thing you are not allowed to use is another person. Software maybe deployed to insure that you are not communicating (texting, talking etc...) with another person while you take a quiz.

Lecture Homework: Homework questions will be assigned in D2L/Brightspace from the various assigned chapters as well as three additional written homework assignments that will be scanned as a PDF file and uploaded into D2L/Brightspace. The due dates for all of these assignments can be found on the "Lecture Outline" page of this document (page 8). The homework assignments consist of questions pertaining to the material in the chapter/topic. The homework questions will be activated once we begin that chapter/topic and then they will be deactivated by D2L/Brightspace at 11:59PM on the due date. These questions will be set up so that you can keep redoing the questions over and over again until you receive a 100%. The professor will record the score of your last attempt in the grade book. This process should enable you to have close to a 100% average in the HW category (15% of your lecture grade) and more importantly help you do better on quizzes and tests as you may see very similar questions on exams and quizzes. The handwritten assignments will either be from the textbook or PDF files to print, complete, scan (as PDF) and then submit on D2L/Brightspace.

Lab Grade Component Information:

Lab Exams: There will be a midterm and a final laboratory exam based upon material covered in the lab sessions. As we are learning lab remotely on Zoom this semester, the exams will be on D2L/Brightspace and a time limit will be set. The exams will be open and you can use your notes, textbook and D2L/Brightspace. The only thing you are not allowed to use is another person. Software maybe deployed to insure that you are not communicating (texting, talking etc...) with another person while you take exams.

Lab Quizzes: There will also be three announced lab quizzes, during the semester, that will cover material from previous labs. There will be no make-up quizzes. As we are learning lab remotely this semester, the quizzes will be on D2L/Brightspace and a time limit will be set. The quizzes will be open and you can use your notes, textbook and D2L/Brightspace. The only thing you are not allowed to use is another person. Software maybe deployed to insure that you are not communicating (texting, talking etc...) with another person while you take a quiz.

Lab Exercises: Lab exercises are due on D2L/Brightspace in PDF format at 11:59PM one week after we finish going over the lab notes for that lab on Zoom. Labs are to be completed in pencil (NOT PEN).

Labs done in pen will not be accepted. Be sure that you answer all of the questions found inside each lab. Four of the labs (marked as D2L on the lab outline on page 7) have questions similar to the lecture HW questions online. The due date/time for the online completion of these questions is also at 11:59 PM on the same day the lab the questions are associated with is due. Each lab exercise, except for two of them, will be worth 20 points. Except for the two labs which are worth 40 points, students will be allowed

to drop their lowest lab exercise score. A student who misses one lab will of course have a ZERO dropped instead. Make sure that before you scan your lab to be submitted, that you verify the pages that need to be uploaded. Specific directions about which pages need to be scanned and uploaded will be provided for each lab. Please visually check your PDF scans (for clarity, not cut off, pages in order) before uploading the lab document pages into D2L/Brightspace. You may need to rescan your lab if any pages are not clear or cut off etc.

Class Participation: In order to receive the maximum amount of these points students should be actively participating by paying attention and taking notes on the current topic. There will be random Zoom checks to make sure that you are there. Additionally at various random times during the semester students will be called upon randomly to answer a question regarding the current topic. This means no one should be walking away from the Zoom class session to do something else. The professor will note who is and who isn't prepared for class, including those who do not respond when they have been called upon to answer a question or a Zoom check.

Email Extra Credit: As per NCC policy, students should only use their NCC student email to communicate with their professors. Prior to February 1, 2024 @ 1159PM, you should send the professor an email from your NCC student email account. This email can be used to introduce yourself, explain what your major is and what your plans are for the future. Students who do this will receive extra credit as discussed on the first day of lab. It is strongly recommended that students set their smart phone to receive their NCC student email as instant notifications. This can be accomplished by using badges and banners in the notification settings on your phone.

Withdrawal: In order for there to be no record of this course on your transcript you must drop the class prior to 11:59PM on Wednesday, February 14, 2024. After this date, the last official day to receive an automatic "W" is Monday, April 8, 2024. Students who wish to withdraw from the course after this date must meet with the professor on Zoom to discuss why a withdrawal is necessary and to discuss any other alternative steps that may be taken. Students may do this up until 3:45PM on Thursday, May 16, 2024. After this time the student will receive the appropriate grade for the course work completed. It is noted that a student who has been absent 3 or more times, without making up the missed work as discussed prior, will receive an "F" or "WU" unless he/she officially withdraws from the course by requesting a withdrawal via the NCC Portal. A grade of "WU" is given out if a student disappears from the class and does not request a withdrawal by the proper date. Keep in mind that a "WU" may impact your ability to receive financial aid in the future. FYI at NCC students have the ability to retake any course for a higher grade to replace any "WU", "F" or other low grades that were earned.

Statement for Students with Disabilities: If you have a physical, psychological, medical, or learning disability that may have an impact on your ability to carry out the assigned coursework, I urge you to contact the staff at the Center for Students with Disabilities (CSD), via email, CSDOffice@ncc.edu or by phone at 516-572-7241. The counselors at CSD will review your concerns and determine to what reasonable accommodations you are entitled as covered by the Americans with Disabilities Act and section 504 of the Rehabilitation Act of 1973. All information and documentation pertaining to personal disabilities will be kept confidential.

Office Hours/Extra Help: If for any reason you do not understand any of the material covered in class, do not hesitate to ask for extra help. I will be available for help during my office hours. If you can not meet during my scheduled office hours talk with me to arrange an appointment. Office hours can also be used to go over assignment or homework questions before or after they are due. Students who wish to inform the professor of learning disabilities or medical conditions may come to Zoom office hours to discuss the situation in private. The Zoom Meeting ID number for office hours is different than our regular lecture and lab Zoom Meeting ID number. The Zoom Meeting ID for office hours can be found at the beginning of this document.

Other Important Notes:

- 1) The deadline to apply for a May 2024 graduation/degree is Monday, February 26, 2024. Students who miss this deadline will have to wait until August of 2024 to graduate.
- 2) Conversion Day: Thursday, April 25, Day and Eve classes follow a Tuesday schedule

MET 101 B++ - Spring 2024 - Laboratory Outline (Tentative)

Preparation: At a minimum, students are required to read each lab/labs and any reading assignments from the textbook before coming to the laboratory Zoom session. There are PowerPoint presentations posted in D2L/Brightspace regarding the new concept(s) for the week and how to do the lab. You could watch these and get started on the lab before our Zoom start time. If you can show me your completed lab and complete notes in your notebook, you could leave the Zoom lab session early.

Note: Those labs below with the letters (D2L) after the title of the lab have required questions to complete online inside D2L/Brightspace. The due date/time for online completion of these questions is at the start time/date of the next lab session.

<u>Date</u>	<u>Lab #</u>	<u>Lab(s) Covered</u>	<u>Lab Manual Pages</u>	<u>7th Edition Textbook Reading Assignment</u>
Jan 29	0	Syllabus		
Jan 31/Feb 5	1	Using Doppler Radar: WSR-88D	143-152	326-329
Feb 7/12	2	Isopleth Analysis * Isotherms (D2L)	13-16 17-26	69-76
Feb 14/21	3	The Effect of Heat Capacity on Temperature (D2L)	31-38	56-57, 64-67
Feb 26/28/Mar 4	4	* Isobars	39-46	25, 98-100
Mar 6/18	5	ASOS and METAR	7-12	401-402
Mar 20/25	6	Surface Station Models	59-79	26-27, 401-402, 410-412, 530-533
Mar 27/Apr 1	7	Air Masses and the Stationary Front (D2L)	115-118	262-268, 277, 288-292
Apr 3/8	8	* Warm and Cold Fronts (D2L) Announced Lab Quiz 1: Surface Station Models ^(See Note 2)	119-130	268, 270-279, 288-292
Apr 6 or 7		Lab Midterm Exam		
Apr 10/15	9	* Skew-T Diagram Part I (Up to RH ₂) ^(See Note 1)	80-86	401-402, 416-417
Apr 17/22	9	* Skew-T Diagram Part II (Max Temp to End) ^(See Note 1)	87-96	418, 165-169, 173-174
Apr 24/29	10	Precipitation Processes	97-106	141, 190-196
	11	Upper Air Station Models	107-112	401-402, 412-415
May 1/6	12	* Severe Weather Analysis ^(See Notes 1 and 3) Announced Lab Quiz 2: Warm and Cold Fronts ^(See Note 2)	131-142	345-348, 412-415
May 8/13/15	12	* Severe Weather Analysis ^(See Notes 1 and 4) Announced Lab Quiz 3: Air Masses and Analysis of Warm and Cold Fronts ^(See Note 2)	131-142	
May 18 or 19		Lab Final Exam		
May 21/22/23		Make-Up Days if Necessary		

Note 1: This lab will be worth double the normal points (40 Points).

Note 2: This quiz will open at the conclusion of the days lab session and will be due prior to 1159PM.

Note 3: Begin this lab prior to the start time on Zoom. Finish maps 1, 2 and 3 ahead of time. The professor will have you individually show maps 1, 2 and 3 at the beginning of lab that day on Zoom.

Note 4: This lab will be due and must be submitted on D2L/Brightspace before 9:15AM on May 15, 2024.

MET 101 B++ - Meteorology - Spring 2024 - Lecture Outline (Tentative)

As the lecture portion of the class is online, you should be taking detailed notes from the chapter PowerPoint's following the dated guide below. Since you have been given this dated outline it is your responsibility to know when assignments are due and when quizzes or tests will be given. Reminders of due dates for Lecture HW, Quizzes and Exams can also be found in the D2L/Brightspace calendar.

<u>Day #</u>	<u>Date</u>	<u>Chapter</u>	<u>Topic/Important Notes</u>
1	Jan 25	1	Outline/Syllabus, Chapter 1: What is Meteorology? Definition of Weather
2	Jan 29	1	Internet Map Discussion, Where can we obtain weather info?, Who uses weather info? Jobs available in the field of meteorology, Weather and Basic Commodity Prices, The Atmosphere, Permanent Gases, Variable Gases: 1) Water Vapor, 2) Carbon Dioxide, 3) Ozone, 4) Methane
3	Jan 31	1	5) Aerosols/Particulate Matter; Density and Air Pressure, Air Pressure Rule of Thumb, Layers of Atmosphere Based on Temperature
4	Feb 5	1	Internet Map Discussion, Ionosphere, Ozone Dilemma
5	Feb 7	1	HW # 1 Due, Ozone Dilemma cont., Weather vs. Climate, History of Meteorology
6	Feb 12	2	Chapter 2: Energy and Energy Types (Kinetic Energy, heat energy and electromagnetic radiation), Heat
7	Feb 14	2	Quiz Chapter 1, Electromagnetic Radiation, Conduction, Convection, Radiation Laws,
8	Feb 21	2	Stefan Boltzmann Law, Wien's Law, Radiation of the Sun and the Earth, Why the Earth has Seasons, Milankovitch Cycles, Perihelion, Aphelion, Rotation/Revolution Website, Length of the Day, Arctic Circle, Antarctic Circle, Solar Elevation Angle, Solar Declination, Annual Migration of Direct Rays of the Sun
9	Feb 26	2	HW # 2 Due, Summer/Winter Solstice and Autumnal/Vernal Equinox, Tropic of Cancer, Tropic of Capricorn, Why the times and/or dates of the solstices and equinoxes differ each year?, Atmospheric Beam Depletion, Changes in Energy Receipt with Latitude, Winnipeg vs Austin
10	Feb 28	3	Review for Exam I, Chapter 3: Insolation, Absorption, Reflection, Scattering, Rayleigh Scattering, Blue Sky, Mie Scattering, Haze, Red Sunrise/Sunset, Non-Selective Scattering
11	Mar 2 or 3		Lecture Exam I (Chapters 1 & 2)
12	Mar 4	3 & 17	Chapter 17: Rainbows, Rainbows and Weather Forecasting (Not in text), Primary Rainbow, Secondary Rainbow, Chapter 3(cont): White Clouds, Scattered Light and Colored Clouds (Not in text)
13	Mar 6	3	HW # 3 Due, Pass back Exam I, Solar Energy Distribution (The Fate of Solar Radiation), Greenhouse Effect, Sensible and Latent Heat: Human Perspiration and Air Cooled Rain, Atmospheric Window
14	Mar 18	3	Earth's Annual Energy Balance, Latitudinal Variations and the Energy Balance, Advection, Ocean Currents, Geographical Influences on Temperature
15	Mar 20	3, 4 & 5	HW # 4 Due, Air Temperature and Human Comfort: Wind Chill Factor, Heat Index, Chapter 4: Air Pressure, Dalton's Law, Surface Pressure vs Sea Level Pressure
16	Mar 25	4	The Equation of State (Ideal Gas Law), Pressure Gradients: 1) Horizontal and 2) Vertical, Hydrostatic Equilibrium, Microburst, Coriolis Force, Friction, Convergence vs Divergence, High and Low Pressure Systems
17	Mar 27	4 & 5	Quiz Chapter 3, Surface Wind Directions around High and Low Pressure Systems in the N. and S. Hemispheres, Buys-Ballot's Law, Buys-Ballot's Law and Weather Forecasting, Chapter 5: Introduction to Atmospheric Moisture, Phase Changes of Water, Saturation
18	Apr 1	5	HW # 5 Due, Hydrologic Cycle, Wx. Channel Video "Water Oceans to Air", Transpiration, PWAT, Indices of Water Vapor Content, Vapor Pressure, Saturation Vapor Pressure, Relative Humidity, Dew-Point Temperature (Td), Sling Psychrometer Demo Video
19	Apr 3/8	5	HW # 6 Due, Dew-Point Temperature and RH, Three Methods of Achieving Saturation, Dew, Frost, Frozen Dew, Black Frost
20	Apr 10/15	5	Quiz Chapter 4 & 17, HW # 7 Due, Condensation Nuclei, Hygroscopic Nuclei, Haze, Types of Fog (Handout), Distribution of Fog, Positive and Negative Aspects of Fog
21	Apr 17	5 & 6	HW # 8 Due, Review HW # 6 and 8, Review for Exam II, Chapter 6: Formation and Dissipation of Cloud Droplets, Cloud Classification System: 4 Groups of Clouds
22	Apr 20 or 21		Lecture Exam II (Chapters 3, 4, 5 and 17)
23	Apr 22/24	6	Cirrus, Cirrostratus, Cirrocumulus, Altostratus, Altocumulus, Stratus, Nimbostratus, Stratus-fractus or Scud, Stratocumulus, Cumulus humilis, Cumulonimbus, Mammatus, Lenticular, Banner, Cloud Pictures, USPS Cloud Stamps
24	Apr 29	6 & 13	Conditions one would Experience as a cB Cloud Passed Overhead, Clear Air Lightning, Storm Chasing, The Four (4) Mechanisms that Lift Air, Chapter 13: Three (3) Satellite Image Types: 1) Visible 2) Infrared and 3) Water Vapor
25	May 1	6	HW # 9 Due, Orographic Uplift Effect, DALR, MALR, California Central Valley, Deserts, Discuss Orographic Uplift HW Problem
26	May 6	7	HW # 10 Due, Chapter 7: Distribution of Precipitation, Precipitation Types (Handout), Rain, Drizzle, Differences in the Formation of Sleet, Snow, Freezing Rain and Rain
27	May 8	7 & 11	HW # 11 Due, Hail, Largest Hailstone, Annual Average Number of Hailstorms in the US, Chapters 11 and 12: Air Mass Thunderstorms, Severe Thunderstorms, Derecho
28	May 13	11 & 12	Quiz Chapter 6 (Clouds) & 13 (Satellites): Discuss Video Questions Handout, Thunderstorms Video, Formation of Lightning (Handout), Electrification of Clouds-Charge Separation (Handout), Tornado Formation, Enhanced Fujita Scale Downtown Miami Tornado Video
29	May 15	12	Hurricanes, Development (Tropical Disturbance, Tropical Depression, Tropical Storm, Hurricane) Weather Channel - Weather in the Classroom Videos: Hurricanes - Episode 7a (Formation, Structure and Storm Surge) and Episode 7b (Hurricane Season, Names, Saffir-Simpson Scale), Dangers Edge Video
30	May 20		HW # 12 Video Questions Due, Lecture Final Exam
MD	May 21/22/23		Possible Make-Up Days

HW Assignments (Due dates are listed above)

HW # 1: Chapter 1: D2L/Brightspace

HW # 2: Chapter 2: D2L/Brightspace

HW # 3: Chapter 17 (Rainbows): D2L/Brightspace

HW # 4: Chapter 3: D2L/Brightspace

HW # 5: Chapter 4: D2L/Brightspace

HW # 6: Chapter 5: Problems & Exercises 3, 4a and 4b ^{Note 1}

Note 1: Use the Fahrenheit data and tables to determine your answers.

HW # 7: Chapter 5: D2L/Brightspace

HW # 8: Dew/Frost/Frozen Dew/Black Frost HW Problem

HW # 9: Chapter 6 & 13 - Clouds & Satellites: D2L/Bright...

HW # 10: Orographic Uplift HW Sheet

HW # 11: Chapter 6 - Stability: D2L/Brightspace

HW # 12: Video Questions