

## NRM 140, The Climatic Factor

Course Web-site: Log into your personal portal to BlackBoard at <http://bb.gvsu.edu>  
-- your login is your student network login which for most is your GVSU e:mail name and your password as you have set it.

CATALOG DESCRIPTION: A study of the atmosphere, broad aspects of weather and climate, microclimatology, the geography of climate and effects on terrain, vegetation, and people.

PREREQUISITES: none

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SPECIAL NEEDS: If there is any student in this class who has special needs because of learning or physical disabilities, please contact the Office of Academic Support (OAS), at 331-2490 as soon as possible.

GENERAL EDUCATION INFORMATION: NRM 140 is a physical science foundation category course. The physical sciences explore and seek to explain the behavior of the physical universe. They seek to understand the fundamental workings of nature, from the behavior of particles of matter to the functioning of the galaxies. Study of the concepts, history, contexts, and methodologies of the physical sciences assists students in becoming scientifically literate. This course is a broad introduction to climatology and will contribute to the development of critical thinking and problem-solving skills, and help students apply an understanding of scientific ways of thinking to their own lives and careers.

NRM 140 is an examination of the principles and questions that define climatology. We will seek an understanding of how scientists use information and theory to explain the phenomena observed in our climate system. And we will study the forces of nature, the structure of materials, and the role of energy in the climate system as unifying concepts of the physical sciences.

In NRM 140 we will work to help each other become more skilled at effective speaking and writing by participating in those activities. We will work to learn to think more critically and creatively. And we will try to improve our skills of locating, evaluating, and using information more effectively.

TEXT: Lutgens, Frederick K., and Edward I. Tarbuck. 2004. THE ATMOSPHERE: an Introduction to Meteorology. 9th ed. Prentice Hall; Upper Saddle River, N. J.

OBJECTIVES: The big idea of the course is to recognize the interactions between climatic factors and human activities. In order to do this, a substantial amount of knowledge of the climate system is essential. At the end of the course, the student will be able to:

1. discuss the nature of the atmosphere.
2. discuss the structure and function of the climate system.
3. relate atmospheric processes to climate.
4. relate climate to selected geographic features.
5. relate vegetation to climate characteristics.
6. relate human activities to climate.

COURSE REQUIREMENTS: Each STUDENT is expected to take all examinations and submit all assignments on time. Unexcused late assignments, reports, lab exercises and other papers will be penalized 50% for each calendar day they are late and the student's grade will be docked 50% of each one that is not submitted. Each STUDENT is expected to contribute to each laboratory session. Each STUDENT must supply his/her own #2 pencil to mark computer scored answer sheets. The name and student number must be encoded on each quiz/exam scantron sheet.

TENTATIVE REQUIREMENTS AND BASIS FOR GRADING: (may be altered if necessary)

Quizzes and Exams (ALL WILL BE CLOSED BOOK/NOTES).....220 Pts.

Laboratory work (60 pts) and lab exam questions (50 pts).....110 Pts.

Final comprehensive EXAM..... 110 Pts.  
 TOTAL..... 440 Pts.  
 Additional work and scoring at instructors discretion.....variable

GRADING POLICY:	A	93-100%	A-	90-92%
	B+	87-89%	B	83-86%
	B-	80-82%	C+	77-79%
	C	73-76%	C-	70-72%
	D+	67-69%	D	60-66%
	F	0-59%		

The instructor reserves the right to lower but not raise this scale.

ABSENCES: You cannot afford to miss class. Please review the standard Class Attendance policy of GVSU in the current catalog as it is the basic policy for absences in this course. It is expected that every student will be present at every scheduled course meeting. Known absences will be recorded. The absent student is solely responsible for material missed. The instructor will not redeliver lectures on a one-to-one basis. If instructor is to allow make-up work for a non-catastrophe excused absence, the request must be submitted before the next class period. At the instructor's discretion, the points lost for an excused absence may be assigned to the final exam. If possible, notify instructor in advance of the absence. A request for make-up work and excusing an absence must be made IN WRITING. A special form will be provided, however a generic note will be acceptable.

BRIEF STATEMENT OF TEACHING PHILOSOPHY: I expect the student members of the class to contribute to the success of the class and work to try to relate the class content to their professions and their lives. The instructor will work to motivate the students, to identify the important aspects of the topic at hand, to provide meaningful opportunities to learn, and to maintain appropriate standards of performance. The administration of this course will be based on the premise that each student will be present on time every session in order to learn facts, methods, principles, theories, hypotheses, and opinions -- both directly and indirectly concerning the subject. The instructor cannot say everything about the subject at hand that is important, thus the student is expected to be a scholar in training; to make detailed notes, to study and search lecture notes, textbooks, library reference materials, course assignments, and the world in which we live. In short, the student is expected to be a modern hunter and gatherer -- of information. Since it is hoped that the student will be able to synthesize facts and theories into solutions to problems and answers to questions, test questions may not have been explicitly answered in lecture. Thus success does not depend solely upon memorization of facts.

An often quoted guideline suggests that a University student should expect to spend two hours studying outside the classroom for each 50 minutes (one contact hour) spent in the classroom. Some students may need more time and others less time for the level of mastery desired by and acceptable to the student. All class activities are conducted for the explicit purpose of helping each student learn. Unless otherwise stated by the instructor, it is intended that each student should work independently. You are expected to come prepared to work until the end of each class period.

The grade assigned at the end of the course will be the instructor's best judgment of the students level of ability to perform in the area of study as evidenced by scores earned in the course. The student and instructor share a responsibility to maintain a current accurate record of progress. All course materials should be kept by the student until the grade is verified. The instructor will work to guide and facilitate the learning process, but will not accept responsibility for a student's lack of performance. A grade of A designates an all-around superior performance. A student cannot get an A in the course based on one good scholarly strength or product or mode of evaluation. You must do well on exams, reports, and all other work.

PORTFOLIO DEVELOPMENT: I recommend that you enhance your personal portfolio with materials from the course, which may include your course journal, class notes, reading notes, presentation notes and aids, and other products.

#### IMPORTANT DATES

Other quizzes, exams, and assignments to be announced

Jan. 9, 2004: FRI., Last day to drop/add

Feb. 27, 2004: FRI., Last day to drop with a W

Mar. 1-5, 2004: Spring Break

Apr. 16, 2004: FRI., Last day of this class

Apr. 20, 2004 : TUE., 2:00-3:50, FINAL EXAM (comprehensive, computer scored 110 pts.)

LECTURE TOPICS: This course will consist of a systematic study of the structure and processes of the climate system with a focus on their relationships to climatic causation, occurrence of world climates, and the methods for measuring and understanding weather phenomena. A brief overview of the climates of the world will set the context for the work of the semester, then the text will be covered generally in order at a rate of approximately one chapter per week. Certainly, some memorization is required, but the goal is to be able to explain why climates are what and where they are, or, given a location, predict the climate rather than memorizing the locations of the climates.

LABORATORY WORK: There will be one hour and fifty minutes of laboratory work per week and completion of the assigned exercises will be required. Each student is expected to be involved in conducting weekly mini-projects and submitting an appropriate research report. Students will be grouped and each group will be assigned to make outdoor observations and will be expected to keep observation records. Records may be kept for:

- 1) The amount and type of cloud cover
- 2) Current air temperature, wind chill, dew point, humidity
- 3) High and low periodic temperatures
- 4) Precipitation type and amount if any
- 5) Wind speed and direction
- 6) Estimate of upper air wind speed
- 7) Upper air wind direction (by observing clouds)
- 8) Barometric pressure
- 9) Passage of high and low pressure systems
- 10) Current conditions
- 11) Soil and surface temperatures
- 12) Snow cover and melt water equivalent
- 13) others as appropriate

Those observations will be summarized at the end of each day.

If there is a valid reason that a student should not be expected to make these outdoor observations, an alternate assignment will be given upon request.

Students may be grouped for some of the other laboratory exercises. The laboratory work will include geographic exercises and map work related to climate studies, experiments and observations involving record-keeping, data manipulations, calculating weather summaries, and studying videos.

Each student is expected to submit her/his own original reports and products. Even group work then provides the opportunity and incentive for originality.

TENTATIVE LABORATORY SCHEDULE: (may be altered if necessary)

Lab # Lab exercise in progress

- 1 Experimental Design & weather observation prep -- Read Box 1-3 before this lab.
- 2 1st weather observation mini-project. Please come prepared to spend 30-40 minutes outdoors doing field work. Summarization and tabulation of observation data.
  
- 3-10 Outdoor observations at start of lab plus experiments, exercises, and videos each week. Mini-project write-up due one week later.
  
- 3 MP/Earth-sun relationships -- Read chapter 2 before this lab. (4+4)
- 4 MP/Weather Watch data retrieval -- Read chapter 3 before this lab. (4+4)
- 5 MP/Dew point experiment -- Read pp 95-107, 494 and Appendix C before this lab. (4+4)
- 6 MP/Snowfall exercise -- Read pp 144-6, 149, and 233-8 before this lab. (4)
- 7 MP/World geography (4)
- 8 MP/Geography and Electric Skies video -- Read pp 280-295 before this lab. (4+4)
- 9 MP/Tornado video -- Read pp 295-310 before this lab. (4)
- 10 MP/Hurricane movie -- Read chapter 11 before this lab. (4)
- 11 Man Made Desert video and Aral Sea -- read Box 15-3 before this lab
- 12 US climate mapping & Climograph construction -- Read Box 15-1, pp 420-1, and 426-443 before this lab. (4)
- 13 World climate mapping -- Read chapter 15 before this lab. (4)
- 14 Koeppen climate classification -- rewatch World Climate video (4)

Alternate lab work as appropriate

- Geography and map work
- Scientific inquiry using G.R. temperature data
- Cooling, Heating, and Growing Degree days, etc.
- Frost exercise
- Cloud chamber experiment
- Soil/Plant water exercise
- Chasing El Nino video
- Flood video
- Others to be developed