

University of Houston-Downtown

Course Prefix, Number, and Title: GEOL 1304: Introduction to Meteorology

Credits/Lecture/Lab Hours: 3/2/2

Foundational Component Area: Life and Physical Sciences

Prerequisites: None

Co-requisites: None

Course Description: An integrated lecture/laboratory course for non-science majors. This course will focus on the study of the atmosphere – its composition, structure and properties with emphasis on the processes responsible for weather, climate controls and change and the impact of atmospheric phenomena on society. Students will collect, analyze and synthesize online, real-time weather data in order to understand current weather conditions and be able to make predictions of future weather circumstances.

TCCNS Number: N/A

Demonstration of Core Objectives within the Course:

Assigned Core Objective	Learning Outcome Students will be able to:	Instructional strategy or content used to achieve the outcome	Method by which students' mastery of this outcome will be evaluated
Critical Thinking Empirical & Quantitative Reasoning	Utilize scientific processes to identify questions pertaining to natural phenomena.	Comprehension of Meteorology – Students will use scientific processes to analyze questions about the natural phenomena covered in the field of meteorology. These processes include: weather, climate controls an change, and the impact of atmospheric phenomena on society.	Students' ability to understand phenomena is addressed through exams and quizzes.
Critical Thinking Empirical & Quantitative Reasoning	Utilize scientific processes to develop hypotheses, collect and analyze data using quantitative and qualitative measures.	Students will work on laboratory exercises that are related to lecture topics and require them to analyze real-time data online using data from the American Meteorological Society. For example, Weather Formation Case: Students must propose an experiment to test the use of pressure block concept to	Lab exercises will be submitted electronically and evaluated. Students will also be given exams where they demonstrate comprehension of topics covered in lab.

GEOL 1304: Introduction to Meteorology

		demonstrate the influence of air density and air temperature on change in air pressure with altitude, and hypothesize development of clouds. Students must quantitatively and qualitatively analyze example study data and write a summary.	
Critical Thinking Empirical & Quantitative Reasoning Communication	Utilize scientific processes to effectively communicate the analysis and results using written, oral and visual communication.	Students will create a presentation that contains both visual and oral components over a topic in meteorology. For example, students might analyze global warming data and present.	This class is often taught online. As such, an oral presentation has never been included in this online course. By 2014 (when the course will be taught with these new guidelines) an oral presentation will be required. Students will have to give an oral presentation using either Skype or Collaborate available in Black Board Learn. The presentation will be evaluated on scientific merit and communication skills using a rubric.
Teamwork	Collaborate in the evaluation of the quality of scientific evidence from multiple perspectives toward the goal of reaching a shared objective.	Students will be assigned some assignments in groups online. Students will have to work collaboratively (online) to complete the assignment (analysis of online data). For example, Cloud Composition Analysis where students must predict cloud composition (type) based on air pressure, temperature and elevation distributions.	Successful completion of the exercise (which required groups working together) will be incorporated into the grade for the course. Students will submit an assessment of team-work contributions to the instructor and this will be used to determine a percentage of the grade.

Additional Course Outcomes: N/A

Course Outline:

Lecture Topics:

INTRODUCTION/MONITORING WEATHER
ATMOSPHERE: ORIGIN, COMPARISON AND CIRCULATION
SOLAR AND TERRESTRIAL RADIATION
HEAT, TEMPERATURE AND ATMOSPHERIC CIRCULATION
AIR PRESSURE
HUMIDITY, SATURATION, AND STABILITY
CLOUDS, PRECIPITATION, AND WEATHER RADAR
WIND AND WEATHER
ATMOSPHERES PLANETARY CIRCULATION
WEATHER SYSTEMS OF MIDDLE LATITUDES
THUNDERSTORMS AND TORNADOES
TROPICAL WEATHER SYSTEMS
WEATHER ANALYSIS AND FORECASTING
LIGHT AND SOUND IN THE ATMOSPHERE
CLIMATE AND CLIMATE CHANGE

Grading/Course Content which Demonstrates Student Achievement of Core Objectives:

Course Grade **A: 90-100** **B: 80-89** **C: 70-79** **D: 60-69** **F: 0-59**

Summary of Course Exams, Quizzes, Activities, and Final	
Quizzes and Assignments	20%
Investigates Exercises (Lab Projects)	15%
Oral Presentation	5%
Interim Tests (20% each)	40%
Final	20%
Total	100%