Montgomery County Community College
GLG 125
The Science of Climate Change
4-3-3

COURSE DESCRIPTION:
The Science of Climate Change is an introductory survey of the causes and consequences of climate change at a variety of time and spatial scales throughout Earth's history. Natural and human-induced climate change will be studied as physical processes with varying dimensions of biophysical and societal impacts. This course should be considered by the following students: those needing to fulfill a lab science Core requirement, those preparing for a career in environmental science, and those considering a Geology or Atmospheric Sciences major seeking a geoscience elective. This course is subject to a course fee. Refer to http://mc3.edu/adm-fin-aid/paying/tuition/course-fees for current rates.

REQUISITES:
Previous Course Requirements

ENG 010A - Basic Writing, ENG 011 Basic Writing II or ESL 011 ESL Basic Writing II

MAT 011 Beginning Algebra or MAT 011B - Beginning Algebra with Review of Arithmetic

REA 011 Fundamentals of College Reading or REA 017 - Vocabulary and Reading Comprehension Development II

Concurrent Course Requirements
None

LEARNING OUTCOMES
Upon suc1 Tm06

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
2. Access online datasets as well as instrumental measurements, conduct quantitative analysis of these data, and apply them in problem-solving.	Collaborative and Individual Projects Computer Simulation	Laboratory Reports Group and Individual Project Reports
3. Relate the physical factors which determine global and regional climate.	Individual and Group Projects Lab and Computer Simulations Text and Outside Readings Lecture	Laboratory Reports Group and Individual Project Reports Examinations
4. Relate the processes responsible for former and current natural climate change.	Text and Outside Readings Lab and Computer Simulations Group and Individual Projects Lecture	Laboratory Reports Group and Individual Project Reports Presentations Examinations
5. Present the causes of anthropogenic climate change.	Text and Outside Readings	

C. Climate Fundamentals
1.

V. Conclusion
   A. What Can Be Done?
   B. What Can You Do?

LAB ACTIVITIES
Lab investigations will center upon, but not be restricted to, the following content areas:

Heat Budget Parameters: inverse square law; angle of incidence
Climate Proxies: North African lake sediments
tree rings
Ice Cores: NCDC and EPICA datasets
Instrumental Record: trends in minimum/maximum temp. & precip.: NCDC
urban heat island: field data and NASA/GISS data
Climate Modeling: NASA/GISS EdGCM model runs & interpretation
Crisis Events: deluge: NCDC rainfall; USGS hydrographs; flood ranking
tropical cyclones: AVHRR imagery/SST; various datasets on Gulf hurricanes
Societal Impacts: sea level rise; agricultural productivity; infectious diseases; species migration; etc.: NASA/GISS TV/SEDAC spatial analyses

LEARNING MATERIALS:
Ruddiman, William. (2008). *Earth's Climate, Past and Future* (2nd ed.). W.H. Freeman.
Supplementary Handouts
Numerical Simulation & Spatial Analysis Software

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:
Prepared by:

. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.