



THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Meteorology

MET310 – World Climatology

COURSE PARTICULARS

Course Code: MET310

Course Title: World Climatology

No. of Units: 3

Course Duration: Two hours of theory and one hour of tutorial per week for 15 weeks.

Status: Compulsory

Course Email Address: met310@gmail.com

Course Webpage: <http://www.met.futa.edu.ng/courseschedule.php?coursecode=MET%20310>

Prerequisite: NIL

COURSE INSTRUCTORS

Dr. E. C. Okogbue

Room 012, SEMS Phase I Building,

Dept. of Meteorology,

Federal University of Technology, Akure, Nigeria.

Phone: +2348161530011

Email: ecokogbue@futa.edu.ng , emokogbue@gmail.com

COURSE DESCRIPTION

This course is designed to expose students to the key issues in climatology including the physical basis of climatology and those aspects of climatology which are environmentally important, usually called the climatic elements, namely: temperature, wind, pressure, precipitation, etc. The decomposition of these climatic elements into zonal, meridional, standing and transient circulations will be discussed. Detailed treatment of the mean global atmospheric circulations as represented by the wind, temperature, pressure, humidity will be done to give the students the basic understanding required for modelling the atmosphere using the now popular global circulation models (GCMs). Jet stream climatology, including the synoptic and dynamic considerations for their formation and maintenance and the major jet streams of the world (poles, midlatitudes and tropics) will be treated. Global energy budget and heat transfer and angular momentum considerations and implications for energy and Jet stream maintenance. Mechanisms of achieving global balance in the various climatic elements; the roles of eddies in the general circulation. Climatic trends and climatological forecasting techniques: Frequency of occurrence will be studied in various ways, such as the frequency of both mean and extreme values within stated ranges, or the frequency of particular weather types etc.

COURSE OBJECTIVES

The objectives of this course are to provide students with opportunities to develop:

- basic understanding of the climatic environments of the world, their nature and their causes and those aspects of climatology that are environmentally important, and
- capacity to use various statistical tools and techniques that has developed rapidly with the advent of computers and associated software to analyse mean and extreme values within stated ranges, or the frequency of particular weather types.

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:

(Knowledge based)

- explain the key climatic elements and their decomposition into zonal, meridional, standing and transient circulations;
- explain the difference between weather and climate and the key issues in climatology and role of climatology in national development;
- understand the mean global atmospheric circulations as represented by the wind, temperature, pressure, humidity, and
- understand the key features of both the high and low latitude atmospheres;

(Skills)

- basic climatological forecasting skills and competences ;
- capacity to use various statistical tools and techniques that has developed rapidly with the advent of computers and associated software, and
- carry out statistical analysis such as frequency analysis of both mean and extreme values within stated ranges, or the frequency of particular weather types using data obtained from the Departmental Meteorological Observatory for purposes of :
 - making some local weather discourse
 - making some local weather forecast.

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Weather & Climate Project	20%
Test(s)	20%
<u>Final Examination</u>	<u>60%</u>
<u>TOTAL</u>	<u>100%</u>

GENERAL INSTRUCTIONS

Attendance: It is expected that every student will be in class for lectures and tutorial exercises. Attendance records will be kept and used to determine each person's qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the lecturers, indicating the reason for the absence.

Academic Integrity: Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own; that is plagiarism. All cases of

academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students' misconduct as spelt out in the Students' Handbook.

Assignments and Group Work: Students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn the student zero for that assignment. Only under extenuating circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted.

Code of Conduct in Lecture Rooms and Laboratories: Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, conversation *etc.*) during lectures. Food and drinks are not permitted in the laboratories.¹

Indecent or offensive dressing: Students who dress in an indecent or provocative manner will be sent out of the class.

Procedure for tests and exams:

1. Tests are closed-book exams.
2. For Test, only use of "foolscap sheet" is allowed.
3. Only non programmable calculators are allowed.
4. For exams, extra sheets used must be endorsed by the chief invigilator
5. Bringing cell phones into the exam hall is strictly prohibited.

Special notes

1. We will be doing a project, [analysing the weather records from the Met Observatory from inception to date](#). This will entail obtaining the data sheets from Mr. Nnoli, inputting them into excel spread sheet and analysing them. Students will work in teams and each team will have some tasks to perform with particular data sets for the years of data:
 1. Input observations from the data sheet into the excel spread sheet in particular formats
 2. Perform some statistical analysis following a suggested analysis procedures to be given by me. You should follow these [guidelines](#) for issues to present.
 3. Write a final report, guided by suggested [analysis procedures and some guidelines](#).
 4. The [guidelines](#) will be the basis for determining your grade.

The weather & Climate project reports (one from each " team") will be due by ***the end of the 9th week*** .

READING LIST

²John M.Wallace and Peter V. Hobbs (2005) Atmospheric Science - *An Introductory Survey* Second Edition *University of Washington, USA*, 505p.

²Michael Allaby and Richard Garratt(2009) *Discovering the Earth Atmosphere - A Scientific History of Air, Weather and Climate*, 257p.

Legend

- 1- Available in the University Library
- 2- Available in Departmental/School Libraries
- 3- Available on the Internet.

- 4- Available as Personal Collection
 5- Available in local bookshops.

COURSE OUTLINE

Week	Topic	Remarks
1	Introduction and General Course Overview	<ul style="list-style-type: none"> • During this first class, the Lecturer will ask prognostic questions to enable the lecturer discover his students and their level of knowledge • The expectation of the students from the course will also be documented. • a general overview of the course will be presented • Definitions weather and climate and their differences • Students will be given a project on analysing the weather data from the Met Observatory which will be due for submission at the end of the 8th week
2 & 3	<ul style="list-style-type: none"> • The decomposition of climatic elements into zonal, meridional, standing and transient circulations. 	students will be taught how to decompose the climatic elements into zonal, meridional, standing and transient circulations and tutorial questions will be given them.
4 & 5	Atmospheric Circulations <ul style="list-style-type: none"> • The mean global atmospheric circulations as represented by the wind, temperature, pressure, humidity, etc. 	Students will be taught the major circulation cells and controlling factors of the general circulation of the atmosphere. The major features of the high and low latitude atmospheres will also be discussed.
6	Jet Stream Part 1 <ul style="list-style-type: none"> • Jet stream climatology, synoptic and dynamic consideration for their formation and maintenance • Angular momentum consideration and implications for energy and jet stream maintenance. 	Students will be divided into groups and given topics to prepare slides on, for group presentation.
7 & 8	Jet Stream Part 2 <ul style="list-style-type: none"> • <i>The Jet streams of the world (poles, midlatitudes, and tropics)</i> 	MID-SEMESTER TEST

9 & 10	Global energy budget and heat transfer.	End of 9 th Week: Submission of the weather project
11 & 12	<ul style="list-style-type: none"> <i>Mechanisms of achieving global balance in the various climatic elements; the roles of the eddies in the general circulation.</i> 	
13 & 14	Climatic trends and climatological forecasting techniques.	
15	REVISION	This is the week preceding the final examination. At this time, evaluation will be done to assess how far the students' expectations for the course have been met.