**MET 1205 Tropical Meteorology (3CU)**

**Description**

This course deals with tropical general circulation and systems that interact to cause the weather/climate in the tropical with special reference on Eastern Africa.

**Objectives**

The course will help the students to achieve the following objectives

* Describe the different atmospheric phenomena dominant in the tropics
* Explain the concept of the ITCZ and its relevance to the tropics
* Describe the jet streams and their relevance to weather and climate

**Learning outcomes**

By the end of this course, students should be able to:

* Explain the observed temporal variability of meteorological elements and phenomena in the tropical atmosphere.
* Describe the various types of instability and their role in the convection process using relevant examples.
* Distinguish among the characteristics of the disturbances found in the tropical atmosphere, including their causes, growth and development, and dissipation
* Outline the properties of tropical cyclones and describe their prediction and modeling.
* Elucidate the distribution and controls of zonally asymmetric features of the tropics
* Review the properties of tropical stratosphere that influence tropical climate/weather

**Intellectual, Practical and transferable skills**

* Problem solving
* Analytical
* communication

**Teaching and learning patterns**

The mode of learning involves direct contact with students in form of lectures, Tutorials and assignments

**Indicative content**

* Tropical general circulation: observed mean fields: temperature, zonal wind, mean meridional motions, humidity, sea level pressure, angular momentum balance and maintenance of temperature field; water balance in the atmosphere.
* The tropical stratosphere and mesosphere. Zonal asymmetric features of the tropics: quasi-stationary waves, east-west circulation.
* ITCZ vertical and seasonal characteristics.
* Monsoons and the associated weather with particular reference to Africa and South-East Asia.
* Tropical jet streams and there relationship to thermal wind; subtropical, tropical easterly, west Africa and East African low level jets, easterly waves, major African anticyclones, tropical cyclones, west African squall lines.
* Seasonal location, intensity and structure of the extra-tropical systems which control weather over Africa with special reference to Eastern Africa.

**Assessment Method**

The assessment method is structured to include course work, and final examination. Course work consists of assignments, reports and tests and accounts for 30% of the final grade. The final examination will account for 70% of the final grading

**Core Reference materials**

* **Asnani, G.C**., (1993): Tropical Meteorology, Volume 2, *Pune press*
* **James R. Holton** (2004): An Introduction to Dynamic Meteorology, 4th Edition, *Academic press.*
* **Holton, J.R**., (1992): An Introduction to Dynamic Meteorology, third Edition. *Academic press.*