

SMR 102: INTRODUCTION TO METEOROLOGY II

STUDY GUIDE

1.0 Introduction to the Course

This unit is designed to be an introductory course for undergraduate in Education, Science, Agriculture, Meteorology, Atmospheric Science, Environmental science, Wildlife management and other programs. The unit covers four branches of Meteorology, namely: Mesoscale and synoptic meteorology, Applied Meteorology, Agro-meteorology and Tropical Meteorology. It covers the definitions and explanations of the fundamental concepts of these branches of Meteorology.

2.0 General objectives

This unit on Introduction to Meteorology II has been prepared for the students with the following general objectives in mind to:

- Develop the needed knowledge and skills in fundamentals of four branches of Meteorology
- Introduce the various concepts and techniques used in the four branches of meteorology
- Enable the acquisition of knowledge in the constrains, issues and factors that affect the development of the four fields of Meteorology
- Equip the student with knowledge in the process and problems in applied Meteorology

3.0 Unit objectives

By the end of the unit the student should be able to:

- Outline the scales of atmospheric motion using equations and illustrations.
- Illustrate the general circulation of the atmosphere.

- Evaluate the effects of atmospheric general circulation on oceanic and atmospheric systems.
- Describe the basic characteristics of tropical atmosphere.
- Explain the African weather controlling systems.
- Discuss basic relationships between weather and humans, agriculture, industry and aviation.
- Explain basic concepts of climate change.

4.0 Selected Resources & references

- Ahrens, C. D., 1994: *Meteorology Today*. An introduction to weather, climate and environment. Fifth edition. West publishing Company, New York. Chapter 11, 282-305.
- Miller, a. And J. C. Thompson, 1975: *Elements of Meteorology*. Second edition. C. E. Merrill Publishing Company, Columbus, Ohio. Chapter 5, 115-145.
- Holton, J.R., An introduction to dynamic meteorology. *International Geophysical Series, vol. 48, 3rd edition, 1-150, Academic Press inc., San Diego, California 92101, 1992.*
- Arakawa, A. and V. Lamb: Computational design of the basic dynamical processes of the UCLA General Circulation Model. *Methods in Computational Physics, Vol.17, J. Chang Ed. Academic press, 1977.*
- Taha, H. A., 1982: *Operations Research: An introduction- 3rd Edition*. Macmillan publishing Co. Inc. New York, 417-433.
- Ilyas, M.: Ozone modification - Importance for developing countries in the tropical equatorial region. *In effects of changes in stratospheric ozone and global climate, Vol. 2, pp 185 - 192 , Editor - Titus J. G., 1986.*

- IPCC: WMO/UNEP Inter-Governmental Panel on Climate Change. Editors - Houghton J. T., G. J. Jenkins and J. J. Ephraums, Cambridge Univ. Press, 1990.
- Sneyers, R.: On the statistical analysis for the objective determination of climate change. *Meteorol. Zeitschrift, N.F.1*, 247-256, 1992.
- Michael Branick: A comprehensive glossary of weather. WWW.NOAA/NWSFO/ Norman

5.0 Lecturers

Prof J. N. Muthama, Prof. J. M. Ininda