

SMR 404: Operational Training

Introduction

Operational training is a core course for the student taking Bachelor of Science in Meteorology. This course is offered at fourth level as it requires the application of knowledge gained at level one to three. However, the main prerequisite is Synoptic meteorology and weather analysis. The overall goal of this course is to enable the learner to be thoroughly familiar with the best methods and practices that are applied in weather forecasting over the region. The course is therefore structured to enable the learner to be competent in weather analysis and forecasting. The course has therefore two components, theory and practicals.

As you pursue this course will find out the course is challenging but also exciting. To successfully complete the learner is required to do all the exercises and practicals.

Course Outline

Real-time data collection and processing. Techniques in data analysis, filtration of wrong data, filling in of data holes. Synoptic circulations, three and four dimensional analyses, structures and interpretation of the weather systems. Short, medium and long-range weather forecasts with special reference to eastern Africa and Kenya. Preparation of climate normals: 5 days, monthly, seasonal and mean annual averages and deviations of wind, pressure, temperature precipitation, humidity and other general circulation parameters. Forecasting of extreme weather events and severe local storms. Current weather discussion. using facsimile and forecasting products from Kenya Meteorological Department. Preparation of real-time forecasts for different days ahead. Analysis, identification and forecasting of 24-hour changes. The 24-hour changes in pressure, temperature, humidity, clouds, precipitation and visibility. Diurnal systems: Mountain/valley winds, land and sea breeze, Lake Victoria and Mozambique channel troughs, low level turbulence, haze. Forecasting methods: Statistical, dynamical. Forecasting techniques; historical forecasting, methods used in the Tropics. Forecasting ranges: nowcasting, short, medium and long range. Special forecasts and users: Aviation, marine, agrometeorological, hydrometeorological and the forecast for the general public. Remote sensing: methods, application, satellite, radar and the **APT** techniques; interpretation and use of satellite imagery in weather forecasting. Use of meteograms and thermodynamic diagrams in forecasting.

Course Objectives:

At the end of this the student should be able to:

1. Describe the real-time data collection and processing

2. Differentiate between the various forecasting ranges: nowcasting, short, medium and long range.
3. Discuss the Short, medium and long-range weather forecasting in the tropics
4. Discuss the methods use to forecasting the extreme weather events including severe local storms.
5. Describe how the seasonal climate prediction is done.
6. Explain how the weather charts are used to forecast several days ahead
7. Describe the various forecasting methods including: Statistical, dynamical and dynamical-Statistical.
8. Discuss the user specific forecasts with particular reference to Aviation, marine, agrometeorological, hydrometeorological and the forecast for the general public.
9. Discuss the use of APT techniques in interpretation and use of satellite imagery in weather forecasting.
10. Describe how the meteograms and thermodynamic diagrams are used in weather forecasting.