Australian Government
Bureau of Meteorology

Introduction to Meteorology Online
Course Overview

Course Information

Duration: 10 – 15 hours

Format: Self-paced online

Pre-requisites: Nil; limited science knowledge assumed

Course Overview

The Introduction to Meteorology Online course will equip you with a broad understanding of the driving forces in our atmosphere, how it is observed and how a range of phenomena are forecast.

In the first half of the course we explore the role of the sun in driving the weather via the global circulation. The big picture of meteorology (referred to as synoptic-scale meteorology) is then explained using the mean sea level pressure chart and features depicted on these charts as the basis. You will begin to develop predictive skills by relating synoptic-scale meteorology to the resulting weather phenomena. This extends to predicting wind direction and speed, temperature, cloud types, and precipitation to name a few. Observation systems such as satellite, radar, and surface observations are explained alongside these weather phenomena. The first half of the course concludes with a description of the forecast process used by Bureau weather forecasters and learning how to correctly interpret precipitation forecasts.

The course then introduces you to thunderstorms and severe weather in Australia, including what causes thunderstorms and how severe thunderstorms and severe weather warnings differ. The remaining modules are then focused of different aspects of the forecast and warning services the Bureau provides. You will be introduced to the key climate drivers for Australia and our climate outlook services. The fire weather and heatwaves module describes the influence of the weather on fire behaviour, the Australian Fire Danger Rating System, and the Bureau's fire weather and heatwave forecast and warning services. The tropical cyclones module explores where and why tropical cyclones form, the hazards they bring, and interpretation of cyclone warnings. Finally, the flood forecasting module introduces the different types of flooding seen in Australia and outlines the riverine flood warning service.

Each of the ten modules in this course take approximately 1 to 1.5 hours to complete, and enrolment provides 1 year of access to the course modules, including any updated content.

The training is made up of a combination of reading, bespoke graphics, instructional videos from qualified meteorologists and hydrologists, and interactive activities for you to check your understanding. Upon finishing all 10 modules, you will be awarded a certificate of completion to download.

Further details of the topics covered, and broad learning outcomes, are shown over page.

Topics	Learning Outcomes
Global Circulation	• Explain the role of the sun in driving the weather and seasons • Outline the vertical structure and properties of the atmosphere • Describe how the atmosphere redistributes heat around the globe • Explain how dry and wet areas of the planet are related to the global circulation
Synoptic-scale Systems	• Forecast general wind direction, wind strength, rainfall and temperature conditions using the synoptic weather chart • List the major surface and upper weather systems that influence Australia • Describe the seasonal movement of these systems • Explain the seasonal rainfall patterns of Australia
Watching the Weather	• Describe how wind, temperature and rain are observed • Identify the major cloud types and their associated weather • Interpret satellite imagery using the Bureau's Satellite Viewer • Interpret radar imagery and outline the limitations of radar technology
Weather Forecast Process	• Describe the process meteorologists use to produce forecasts and warnings
Thunderstorms and Severe Weather	• Describe how thunderstorms develop and evolve • Explain thunderstorm ingredients, structures, and types • List threats posed by Severe Thunderstorms • Outline thunderstorm forecast and warning services • Outline Severe Weather phenomena and thresholds • Explain the difference between severe weather warnings and severe thunderstorm warnings
Understanding Rainfall Forecasts	• Develop an understanding of rainfall probabilities • Develop an awareness of how rainfall is forecast • Clarify understanding of rainfall amount and probability forecasts • Explain how meteorologists approach uncertainty
Climate Principles	• Explain the difference between weather and climate • Outline the key influences upon the Australian climate • Identify and use climate monitoring tools • Locate and interpret climate information available from the Bureau, including ENSO and seasonal climate forecasts
Fire Weather and Heatwaves	• Describe weather conditions conducive to fires • Outline the Bureau's fire weather services • Recognise typical weather patterns that lead to increased fire danger • Define a heatwave and describe associated weather patterns
Tropical Cyclones	• List the key features of a tropical cyclone (TC) • Outline where, when, and how often TCs occur • Describe the hazards associated with TCs and how they can vary from one TC to the next • Access and interpret TC warnings and information
Flood Forecasting	• Define different types of floods • Describe the riverine Flood Forecasting & Warning Service • Explain the difference between a flood watch and warning • Describe key flood forecasting uncertainties • Use environmental information to make your own flood forecast