

Course 12.812, General Circulation of the Earth's Atmosphere
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Section 1: Introduction

The goal of this course is to describe and elucidate the general circulation of the earth's atmosphere. The focus is on the vertical and latitudinal structure of the zonal mean state of the atmosphere. These variations in height and latitude are generally much stronger than those in the zonal direction. However, this does not mean that zonal variations are unimportant – indeed, as we shall see, the zonal variations associated with eddies are of fundamental importance in maintaining the zonal mean structure. However, in this course we do not discuss many phenomena for which the zonal variations are fundamental, e.g., the Walker circulation, and the monsoons. The course's focus is also on the time mean state including the mean seasonal cycle. Thus interannual variations and associated phenomena such as the North Atlantic oscillation and the Southern oscillation are not discussed. The diagnostic studies that are described, in addition to being valuable for deductive theories of the general circulation, are of great value for testing models of the atmosphere and climate.

The lectures are based primarily on the references given in "Study Materials." A lot of the material can be found in the textbook by Peixoto and Oort (1992). This course was started by Victor Starr some 40 years ago, and Jose Peixoto and Abraham Oort were both Starr's students.

All course term papers are required to include some kind of diagnostic calculation based on actual data, either from observations or models.