

## ATM/MSC 220: Climate and Global Change

### **RECOMMENDED TEXTBOOKS:**

*“The Earth System”* by L.R. Kump, J.F. Kasting and R.G. Crane, 3<sup>rd</sup> edition

*“Atmospheric Science: An introductory survey”* by J.M. Wallace and P.V. Hobbs

*“Earth’s Climate: Past and Future”* by W.F. Ruddiman

### COURSE OUTLINE

#### **Introduction:**

The meaning and importance of Global Climate Change

#### **Components of the Climate System:**

Atmosphere: Composition, Structure and Circulation (2 lectures)

Oceans: Circulation and Sea Level (2 lectures)

Land and Sea Ice (1 lecture)

#### **How the Climate System Operates:**

Radiation and Energy Balance (2 lectures)

Carbon Cycle (1 lecture)

Water Cycle, Aerosols and Pollutants (1 lecture)

Climate Sensitivity and Feedbacks (1 lecture)

#### **Lessons from the Past:**

Slow Climate Changes and Ice Ages (2 lectures)

Abrupt Climate Change and the Role of Ocean Circulation (1 lecture)

#### **Changes of the Present:**

Anthropogenic Influence on the Energy Balance and Carbon Cycle (1 lecture)

Observations of Climate Change and Sea Level Rise (2 lectures)

Attribution of Climate Change (1 lecture)

#### **Looking into the Future:**

Climate Modeling and Future Projections (2 lectures)

Regional Climate Impacts (2 lectures)

Climate Impacts on the Rise and Fall of Civilizations (1 lecture)

Sea Level Rise: A global threat and lessons from South Florida (2 lectures)

Solutions: Mitigation and Adaptation (2 lectures)