

Kursbok

Kursbok är "The Earth System" av Kump, Kasting och Crane. Främst används "Pearson New International Edition" (grönt omslag, ISBN 9781292021638), men även "3rd edition" (svart omslag, ISBN 978-0321597793) fungerar.

Läsanvisningar för bokens kapitel

Läsanvisningar gäller den gröna versionen, de sista kapitlen är i annan ordning i den andra versionen.

- a, Högsta prioritet, tas upp på föreläsningar
- b, Främst egen läsning
- c, Ingår i kursen, men låg prioritet
- , Ingår ej i kursen

1 Global change

- a Introduction
- a Global change on short time scales
- b Global change on long time scales

2 Daisyworld

- a The system approach
- a The Daisyworld climate system
- a External forcing: The response to increasing solar luminosity

3 Global energy balance

- b Introduction
- b Electromagnetic radiation
- b Temperature scales
- a Blackbody radiation
- a Planetary energy balance
- a Atmospheric composition and structure
- b Physical causes of the greenhouse effect
- a Effect of clouds on the atmospheric radiation budget
- c Introduction of climate modeling
- a Climate feedbacks

4 The atmospheric circulation system

- a The global circulatory subsystems
- A closer look: How hurricanes work
- a The atmospheric circulation
- a Global distributions of temperature and rainfall

5 The circulation of the oceans

- a Wind and surface currents
- c A closer look: Vorticity
 - A closer look: The 1982-1983 and 1997-1998 ENSO Events
- a The circulation of the deep ocean
 - A closer look: The salt content of the oceans and the age of earth
 - Useful concepts: Isotopes and their use
 - A closer look: Carbon 14 - A radioactive clock

6 The cryosphere

- b Introduction
- b River and lake ice, seasonal snow cover, and permafrost
- a Glaciers and ice sheets
- a Sea ice and climate

7 Circulation of the solid Earth: Plate tectonics

- b Introduction
- a Anatomy of the Earth
 - A closer look: The principle of the Seismograph
- b The theory of plate tectonics
- a Plates and plate boundaries
 - A closer look: Deep-Sea Life at Mid-Ocean Ridge Vents
- b The physiology of the solid Earth
- a Recycling of the lithosphere
- c Plate tectonics through Earth history

8 Recycling of the elements

- a System approach to the carbon cycle
- a The short-term organic carbon cycle
- b The long-term organic carbon cycle
- a The inorganic carbon cycle
- b The carbonate-silicate geochemical cycle
- b Links between the organic and inorganic carbon cycle

9 Focus on the biota: Metabolism, ecosystems and biodiversity

- Kapitlet ingår ej, men läs gärna iallafall

10 Origin of the Earth and of life

- Kapitlet ingår ej, men läs gärna iallafall

11 Effect of life on the atmosphere: The rise of oxygen and ozone

- Kapitlet ingår ej, men läs gärna iallafall

12 Long-term climate regulation

- a Introduction
- a The faint young sun paradox revisited
- b The long-term climate record
- c Variations in atmospheric CO₂ and climate during the Phanerozoic

13 Biodiversity through Earth history

- Kapitlet ingår ej, men läs gärna iallafall

14 Pleistocene glaciations

- c Geologic evidence of Pleistocene glaciation
- a Milankovitch cycles
- a Glacial climate feedbacks

15 Global warming, Part 1: The scientific evidence

- Kapitlet ingår ej här, men del av kursen Klimatmodellering

16 Global warming, Part 2: Impacts, adaptation, and mitigation

- Kapitlet ingår ej här, men del av kursen Klimatmodellering

17 Ozone depletion

- a Ultraviolet radiation and its biological effects
- a Ozone vertical distribution and column depth
- a The Chapman mechanism
- a Catalytic cycles of nitrogen, chlorine and bromine
- a Sources and sinks of ozone-depleting compounds
- b The Antarctic ozone hole
- b Evidence of midlatitude ozone depletion
- b Mechanisms for halting ozone depletion

18 Climate stability on Earth and Earth-like planets

- a Introduction
- a Climate evolution in the distant future
- Climate evolution on Venus and Mars
- b Habitable planets around other stars
- a The Drake equation
- c Ensuring our long-term survival

19 Human threats to biodiversity

- Kapitlet ingår ej, men läs gärna iallafall