Schedule for ATMS 211, as of 8 February 2011. ***Subject to revision.***
Instructor: Stephen Warren TA: Naomi Goldenson

Textbook: Lee Kump, James Kasting, Robert Crane: *The Earth System, Third Edition.* Prentice-Hall, 2010.

Week 1: Introduction to climate and systems
Reading: KKC Chapters 1, 2
Mon 3 Jan Course introduction, recent discoveries, time scales, math quiz
Tues 4 Jan Definition of climate. Homework 1 assigned
Wed 5 Jan Temperature, CO_2 variations. Correlations.
Thurs 6 Jan Systems, Daisyworld
Fri 7 Jan Tutorial: Daisyworld

Week 2: Energy, temperature, solar radiation
Reading: KKC Chapter 3
Mon 10 Jan Geography quiz, scientific terminology, energy.
Tues 11 Jan Temperature, units, the Sun. Homework 2 assigned.
Wed 12 Jan Solar energy, solar constant and variations. ***Homework 1 due.***
Thurs 13 Jan Emission of radiation, planetary radiation balance
Fri 14 Jan Tutorial

Week 3: Planetary radiation balance, Greenhouse effect
Reading: KKC Chapter 3
Mon 17 Jan Holiday
Tues 18 Jan Geog. review, planetary radiation balance. ***Homework 2 due.*** HW 3 assigned.
Wed 19 Jan Greenhouse effect.
Thurs 20 Jan Model of greenhouse. Atmospheric structure and composition.
Fri 21 Jan Tutorial.

Week 4: Feedbacks, clouds, solar energy distribution
Reading: KKC Chapter 4
Mon 24 Jan Climatic feedbacks: water vapor, snow, infrared radiation
Tues 25 Jan Clouds. ***Homework 3 due.*** Homework 4 assigned
Wed 26 Jan Solar zenith angle, cosine law.
Thurs 27 Jan Distribution of sunlight with latitude and season
Friday 28 Jan Tutorial.

Week 5: Atmospheric motions, tropical climates
Reading: KKC Chapter 4, handouts
Mon 31 Jan Solar zenith angle consequences. Pressure, gas law, Hadley cell
Tues 1 Feb General circulation, tropical climates (slides of Africa). ***Homework 4 due***
Wed 2 Feb General circulation, slides of Australia, Coriolis, cyclones, anticyclones.
Thurs 3 Feb Ocean gyres, monsoons
Fri 4 Feb Tutorial. Review for midterm.

Week 6: Water, ice, ocean
Reading: KKC Chapters 5, 6.

Mon 7 Feb	**Midterm exam.**
Tues 8 Feb	Properties of water. Assign Homework 5
Wed 9 Feb	"Reservoirs", hydrological cycle
Thurs 10 Feb	Ice in the hydrological cycle.
Fri 11 Feb	Tutorial. Review midterm.

Week 7: The carbon cycle
Reading: KKC Chapters 8, 15

Mon 14 Feb	Ocean, thermal inertia, the seasons
Tues 15 Feb	Measurements of CO_2. ***Homework 5 due.*** Assign Homework 6.
Wed 16 Feb	Carbon cycle, feedbacks
Thurs 17 Feb	Anthropogenically perturbed carbon cycle, future of CO_2.
Fri 18 Feb	Tutorial

Week 8: Paleoclimate, glacial cycles
Reading: KKC Chapters 15, 12, 14

Mon 21 Feb	Holiday
Tues 22 Feb	Paleoclimate. ***Homework 6 due.*** Assign Homework 7.
Wed 23 Feb	Glacial cycles.
Thurs 24 Feb	Astronomical theory of ice ages.
Fri 25 Feb	Tutorial.

Week 9: Snowball Earth, ENSO, fossil fuels
Reading: Handout, KKC Chapter 15

Mon 28 Feb	Snowball Earth
Tues 1 March	El Niño and the Southern Oscillation (ENSO). ***Homework 7 due.*** Assign Homework 8
Wed 2 March	Fossil fuels
Thurs 3 March	Other anthropogenic greenhouse gases, factors affecting CO_2 emissions
Fri 4 March	Tutorial.

Week 10: Global warming, Ozone
Reading: KKC Chapters 16, 17

Mon 7 March	Evidence for global warming
Tues 8 March	Impacts of global warming, mitigation, adaptation. ***Homework 8 due.***
Wed 9 March	Ozone chemistry
Thurs 10 March	Changes in stratospheric ozone. Course evaluation (of lecture)
Fri 11 March	Review for final exam. Course evaluation (of tutorial)

Week 11: The End

Wed 16 March	Final exam 2:30-4:20 pm