Course Staff
Harry Gibson, Coordinator
Campus mail: 61552
Email: hgibson@austinc.edu
telephone: 813-2344

Guest Lecturers
George Diggs
Don Salisbury
Hank Gorman

Rooms:
MS 127 & 130
Time: 11:00 - 12:20

Exam room assignments made in class prior to each test date

Guest Lecturers
Carol Daeley
Karann' Durland
Rod Stewart

Course Readings:
Ferris, Timothy. *Coming of Age in the Milky Way*
Lakoff, George & Johnson, Mark. *Metaphors We Live By.*
HWC Packet (sold in the Campus Store)
Library Reserve Readings as Assigned

Purposes of the Course:

This is a course about science and scientists. It is a course neither in a particular science nor exclusively in the history or philosophy of science. Rather, the course is designed to introduce you to the ways scientists have come to understand the world around them, and the way they express and solve problems.

Scientists work with models to help them understand the puzzles of nature and to allow them to make predictions about natural phenomena. Scientific models serve not only to describe nature in terms understandable to scientists, but also to offer theoretical frameworks that permit scientists to anticipate how nature will respond when conditions are varied. Scientists do not work in a social and cultural vacuum. The models they construct are influenced by thinking and attitudes of the non-scientific community. In turn, scientific thinking and models influence the social and political theories of their time, and are reflected in the art and literature of the period.
HWC 44 is designed to introduce you to the language, methods, and at times, the madness of science. You must be prepared to give up many notions you now have about science and scientists. Be prepared to explore the relatively ordered world of “normal science” but also the many blind alleys, wrong turns, and false starts that characterize both “normal” and “revolutionary” science. At the same time, be willing to give careful attention to the important connections between the sciences and the humanities.

Grading

There will be four scheduled exams and one optional, cumulative final exam in this course. The dates for these exams are on the course syllabus. Your grade will be computed by averaging the four highest scores you achieve. The four unit exams are not optional; in order to take the optional final, you must have taken the four unit exams. If you achieve a higher score on the final than on one of the unit exams, that score will be substituted for the lower one.

There will also be “attendance” quizzes given several times during the course. The points from these quizzes will be added to your unit test score.

Course grades will be assigned using approximately the following distribution:

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\begin{array}{ll}
A & 100-90 \\
B & 89-80 \\
C & 79-70 \\
D & 69-60 \\
F & 59-0 \\
S & 100-70 \\
D & 69-60 \\
U & 59-0 \\
\end{array}
\]

Plus and minus grades will be assigned as appropriate.

New Grading System

In November 2000, the faculty reviewed and approved a new grading system called S/D/U. Under the S/D/U grading system, course work of a C- or better will continue to receive an S, will not be included in the GPA computation, and will count toward graduation requirements. Coursework below D- will continue to receive a U, will be computed in the GPA, and will
not count toward graduation requirements. Any student on the S/D/U grading system who earns a grade from D- through D+ will be given D-, D or D+, as appropriate. Grades of D- through D+ will be posted to the student’s transcript and will count in the GPA, and can be used to fulfill a graduation requirement. S/D/U grading is advantageous to those students who are below average in ability and who need to maintain a high GPA (3.75+) in order to keep a scholarship. Be sure to keep track of your grading system choice. If you change systems, keep your grade-system change notice until after grades are assigned.

Examination Policies

Lateness: Exams begin at 11 AM. Once the first student leaves an exam room, no one else can begin the exam. The first student usually leaves around 11:20, so oversleeping can cause you to have to take the makeup exam.

Missing an Exam: If serious circumstances beyond your control make it impossible for you to take an exam, you must notify the course coordinator of this in advance of the exam, not after you miss it. The course coordinator is Dr. Harry Gibson (AC extension 2344, e-mail hgibson@austinc.edu). You must submit your request to take a makeup exam in writing to Dr. Gibson, either at hgibson@austinc.edu or his campus box 61552. If sudden and unanticipated calamity occurs (for example an automobile accident on the way to the exam, a death in the family, hospitalization for illness) that you are unable to tell Dr. Gibson about before the exam, you must submit written documentation of this calamity as soon as possible with your request to take the makeup exam.

Taking a Makeup Exam: Permission to take a makeup in place of the scheduled exam is at the discretion of the HWC 44 staff. The staff reserves the right to deny you the opportunity to take a makeup exam. There will be one and only one opportunity to take the makeup. Typically, a makeup exam will be given at 4:30 one week following the regular exam. The makeup for the fourth unit exam is given immediately following the optional final exam. There is no makeup for the optional final.

Why You Should Avoid Makeup Exams: Examinations are difficult to construct. The best sets of questions will have been used in constructing the regularly scheduled examinations. This means that the make-up exams are unavoidably more difficult than the regular exams; routinely, grades are lower on make-ups. It is
therefore to your advantage to take the regularly scheduled
exams, even in the face of some hardship.

Getting Your Exam Results: The HWC 44 staff want you to have
your exam results as quickly as possible. In order for this to
happen, we need your attention and cooperation to some important
procedures. First, do not at any time in this course use your
Instead, use your 5-digit campus mailbox number as your PIN
(personal identification number) on all exams. Use the same
campus mailbox number on all exams—your own. Your exam results
will be mailed to this mailbox. In fairness to you, we will not
mail these results until after the makeup exam is administered.
After the makeup exam, copies of the regular unit exam will be
available to you under the table in the Moody Science lobby that
is used for HWC 44 materials.

Academic Integrity

The principles of academic integrity apply to all your work in
this course. You are responsible for your own work. During
examinations you are neither to give nor receive help from any
source except course staff (if, for example, you have questions
during the exam). Cheating on an exam will be dealt with
harshly; it may result in expulsion from the course with a grade
of F for a first offense. Austin College's published guidelines
will be followed in dealing with any and all infractions of the
honor principle.

Preparing for Exams

Doing the assigned readings and attending class regularly will
do wonders for your exam performance. Keep in mind that
questions may cover video, film, slide, or tape material as well
as assigned readings.

Outlines of each lecture are available before the lecture on the
table in the Moody Science lobby used for HWC 44 materials. Be
sure to pick these up; they will not only help you follow the
lecture but also are invaluable aids in organizing your
studying.

Usually, audiotapes are made of the lectures; you can use these
to help you review and expand your notes. Because of copyright
laws, however, we cannot record for you most of the videotaped
or audiotaped material used during lectures. The lecture tapes
are not, therefore, an adequate substitute for attending class.
The staff normally will conduct a question/answer session on an evening prior to each unit exam. The Academic Skills Center also conducts course help sessions. And don’t forget the staff are available after lectures to answer questions.

We encourage you to work together in mastering the course material and preparing for exams. And we encourage you to meet together regularly to formulate ten possible exam questions for each lecture and to make sure you understood the lecture material.

Plenty of research shows that students who don’t study until just before exams actually spend more time studying but do less well on the exam. Doing it all along really does help, and it’s a lot less painful.

**Tips for Taking Multiple-Choice Exams**

Be sure to read the questions very carefully. Many wrong answers are the result of misreading the question. Pay special attention to words like although, but, not, both/and, either/or. These little words are easy to slide over but often make the difference between the right answer and the wrong one. Be sure to consider each of the five possible answers; start by crossing out the ones you know are wrong. Then look very carefully at those which remain.
Spring 2002 Calendar

LECTURES AND RELATED READING ASSIGNMENTS

UNIT I: MODERN SCIENCE

Meeting #1—February 4, 2002 -- Monday
Introduction to the Course, Underlying Themes, the Staff and Unit 1 (Gibson)
TOPIC Where in the World is Science? (Daeley)
REQUIRED READING
HWC Packet
Ferris: “Not rocket science.”

Meeting #2 – February 6, 2002 -- Wednesday
TOPIC Models, Theories, Hypotheses, and Model Evaluation in Science (Gorman)

Meeting #3 -- February 8, 2002 -- Friday
TOPIC Watching the ancient skies: regularities and cosmic drama (Salisbury)
REQUIRED READING
Ferris: Chapter 1-2, pp 19-45

Meeting #4 -- February 11, 2002 -- Monday
TOPIC To heaven and back: world systems from Aristotle to Copernicus (Salisbury)
REQUIRED READING
Ferris: Chapter 4-5, pp 61-101

Meeting #5 -- February 13, 2002 -- Wednesday
TOPIC Newton and the clockwork universe (Salisbury)
REQUIRED READING
Ferris: Chapter 6, pp 103-122

Meeting #6 -- February 15, 2002 -- Friday
TOPIC Einstein’s gravity: the fabric of space and time (Salisbury)
REQUIRED READING
Ferris: Chapters 10, pp 177-204.

Meeting #7 -- February 18, 2002 -- Monday
TOPIC Cosmic expansion and microscopic wonders (Salisbury)
REQUIRED READING
Ferris: Chapter 11 and 15, pp 205-214, pp 285-299

Meeting #8 -- February 20, 2002 -- Wednesday
TOPIC Stellar Ovens
REQUIRED READING
Ferris: Chapters 15, pp 255-282.

Meeting # 9 -- February 22, 2002 -- Friday
TOPIC The big bang (Salisbury)
REQUIRED READING
Ferris: Chapters 17 and 18, pp 335-366

Meeting #10 -- February 25, 2002 -- Monday

**********UNIT 1 EXAM**********
Given in rooms, as assigned in class

UNIT II: SEEING AND THINKING

Meeting #11 -- February 27, 2002 -- Wednesday
Introduction to Unit: Why Light, Vision, & Thinking as a Unit (Gorman)
TOPIC Newton’s Rainbow (Salisbury)
REQUIRED READING
HWC Packet:
Newton, “Questions on Natural Philosophy”

Meeting #12 -- March 1, 2002 -- Friday
TOPIC An Eyeful of Eyes: The Anatomy of Very Early Vision (Gorman)
REQUIRED READING
HWC Packet:
Peterson, C. Vision, from Psychology: A Biosocial Approach
REQUIRED READING
HWC Packet:
Walsh, V. and Kuliskowski, J. “Seeing colour.” from Gregory et. al The Artful Eye

Meeting #13 -- March 4, 2002 -- Monday
TOPIC On Seeing Color (Gorman)

Meeting #14 -- March 6, 2002 -- Wednesday
TOPIC Perception and Vision I
REQUIRED READING
HWC Packet:

Meeting #15 -- March 8, 2002 -- Friday
TOPIC Perception and Vision II (Gorman)

Spring Break !
Meeting #16 -- March 18, 2002 -- Monday
TOPIC How Do Children See Depth? (Gorman)
REQUIRED READING
http://cogweb.english.ucsb.edu/CogSci/Spelke.html

Meeting #17 -- March 20, 2002 -- Wednesday
TOPIC How Do Children See Objects? (Gorman)

Meeting #18 -- March 22, 2002 -- Friday
TOPIC Vision and Metaphors (Gorman)
REQUIRED READING
Lakoff & Johnson, from Metaphors We Live By, pp 3 – 76

Meeting #19 -- March 25, 2002 -- Monday
TOPIC Artificial Intelligence or Natural Stupidity? (Gorman)
REQUIRED READING
HWC Packet:
Searle, “Is the Brain’s Mind a Computer Program?”
“Machine Consciousness” from Consciousness: Robots and Minds
Allen, “Mind and Its Place in nature”

Meeting #20 -- March 27, 2002 -- Wednesday

***********UNIT 2 EXAM***********
Given in rooms, as assigned in class

UNIT III: THE DARWINIAN REVOLUTION

Meeting #21 -- March 29, 2002 -- Friday
TOPIC Pre-Darwinian Paradigms (Diggs)
REQUIRED READING
Appleman, “Biology Before the Beagle” (33-39)
RECOMMENDED READING
HWC Packet:
Mayr, “The Nature of the Darwinian Revolution”

Meeting #22 -- April 1, 2002 -- Monday
TOPIC The Darwinian Revolution: Evolution of a Paradigm Shift (Diggs)
REQUIRED READING
Appleman, “Introduction” (3-20)
“Introduction” to Origin of Species” (95-98)
“Who is Darwin?” (23-29)
Principles of Geology (285-287)
RECOMMENDED READING
“Objections to Mr. Darwin’s Theory of the Origin of Species” (265-267)

*Meeting #23 -- April 3, 2002 -- Wednesday*

TOPIC  The Darwinian Revolution (Continued) (Diggs)
REQUIRED READING
Appleman, "Evolution and the Nature of Science" (289-304)
HWC Packet:
Dobzhansky, “Nothing in Biology Makes Sense Except in the Light of Evolution”
Mastny, "Antimicrobial Resistance Growing"
On closed reserve for HWC 44 in library: The Evidence for Evolution
RECOMMENDED READING
Appleman, *Origin of Species* (VI, 135-147)
Appleman, *Descent of Man* (Intro, 175-177; I, 177-194)

*Meeting #24 -- April 5, 2002 -- Friday*

TOPIC  Human Evolution Part 1 (Diggs)
REQUIRED READING
HWC Packet:
Lemonick & Dorfman, "One Giant Step for Mankind" from Time
Tattersall, I. "Once we were not alone" Scientific American, January 2000, pp 56-62.

*Meeting #25 -- April 8, 2002 -- Monday*

TOPIC  Human Evolution Part 2 (Diggs)
REQUIRED READINGS
HWC Packet:
Lemonick, “One Less Missing Link” from Time

*Meeting #26 -- April 10, 2002 -- Wednesday*

TOPIC  Uses and Abuses of Biology: Racial Pseudo-science (Stewart)
REQUIRED READING
HWC Packet:
Begley, "Three is not enough" from Newsweek

*Meeting #27 -- April 12, 2002 -- Friday*

TOPIC  Changes in Worldview: Sociobiology (Diggs)
REQUIRED READING
HWC Packet:
Rensberger, “On Becoming Human”
Grady, “The Brains of Gay Men”

RECOMMENDED READING
Appleman, from Sociobiology: The New Synthesis (409-414)
Appleman, “Biological Potentiality vs. Biological Determinism” (415-419)

Meeting #28 -- April 15, 2002 -- Monday
TOPIC Sex and Murder: Matching and Dispatching, (Gorman)
REQUIRED READING
HWC Packet:
Buss and Schmitt, Sexual Strategies Theory: An Evolutionary Perspective on Human Mating

Meeting #29 -- April 17, 2002 -- Wednesday
TOPIC Creationism (Diggs)
REQUIRED READING
HWC Packet:
Set of Creationism articles (13 pages)
RECOMMENDED READING
Appleman, "Mainstream Religious Support for Evolution" (527-533)
Appleman, "Frequently Asked Questions about Evolution and the Nature of Science" (617-623)

Meeting #30 -- April 19, 2002 -- Friday
***********UNIT 3 EXAM***********
Given in rooms, as assigned in class

UNIT IV: THE ENVIRONMENT
Meeting #31 -- April 22, 2002 -- Monday
TOPIC Plate Tectonics (Diggs)
REQUIRED READING
On closed reserve for HWC 44 in library: Miller excerpt, “A Mysterious and Mobile Earth” and Marvin excerpt
HWC Packet:
Hallam, "Alfred Wegener and the Hypothesis of Continental Drift"

Meeting #32-- April 24, 2002 -- Wednesday
TOPIC Plate Tectonics (cont.) (Diggs)
REQUIRED READING
HWC Packet:
Molnar & Tapponnier, "The Collision between India and Eurasia" Magnuson & Angier, "A Noise Like Thunder" and "Anatomy of an Earthquake"
Meeting #33 -- April 26, 2002 -- Friday
TOPIC The Environment: An Overview (Diggs)
REQUIRED READING
HWC Packet:
Brown, "World Grain Harvest Drops"
Gardner, "Population Increases Steadily"
Larsen, "Hydrological Poverty Worsens"

Meeting #34 -- April 29, 2002 -- Monday
TOPIC Ozone Depletion and Global Climate Change (Diggs)
REQUIRED READING
HWC Packet:
Dunn, "Global Temperature Steady"
Karl and Trenberth, "The Human Impact on Climate" Scientific American, (6), 1999, pp 100-105

Meeting #35 -- May 1, 2002 -- Wednesday
Biodiversity and the Extinction Crisis (Diggs)
REQUIRED READING
HWC Packet:
Blaustein, "Amphibians in a Bad Light"
Carpenter & Holmes, "Living with Nature"
Lewin, "Damage to Tropical Forests, or Why Were There So Many Kinds of Animals"
Wilson, "Threats to Biodiversity"

Meeting #36 -- May 3, 2002 -- Friday
TOPIC Tropical Rain Forests (Diggs)
REQUIRED READING
HWC Packet:
Raven, "Tropical Rain Forests: A Global Responsibility"
Raloff, "Unraveling the Economics of Deforestation"
Holloway, "Sustaining the Amazon"

Meeting #37 -- May 6, 2002 -- Monday
TOPIC: Why care about the environment? (Durland)
REQUIRED READING
HWC Packet:
Des Jardins, J. “Biocentric Ethics and the Value of Life.”
Meeting #38 – May 8, 2002—Wednesday
TOPIC  The Environment of North Central Texas: From the Local Perspective to the Global (Diggs)
REQUIRED READING
HWC Packet:
Diggs, Lipscomb, and O’Kennon, “The Blackland Prairie”

Meeting #39 -- May 10, 2002 -- Friday

***********UNIT 4 EXAM***********
Given in rooms, as assigned in class

Meeting #40 -- May 10, 2002 -- Monday
Question and Answer Session

Meeting #41 -- May 15, 2002 -- Wednesday
optional EXAM 12 to 2 pm. Given in rooms, as assigned in class