

Earth Science 130

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Astronomy

Spring 2008

(syllabus subject to change)

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Office hours: MWF 11:00 - noon

| Date | Class | Topics | Pathways to Astronomy | Web site: www.mhhe.com/schneider | | Starry Night CD-ROM |
|--------|-------|---|--------------------------|---|-------------|---------------------------|
| | | | | Animation | Interactive | |
| Jan 15 | 1 | Introduction; Atmosphere | 1,2,3,4,5, 30 ,36 | 5,30A,30B,36 | | Go: satellites |
| 17 | 2 | Rotation of Earth | 7,13 | 7 | | Go: analemma |
| 22 | 3 | Revolution of Earth (select term project topic) | 6 | 13 | 6 | |
| 24 | 4 | Earth as a planet | 35 | 6A,6B,6C | | |
| 29 | 5 | Optics and Telescopes* | 26,27, 28 ,29 | 35A,35B,35C | | |
| 31 | 6 | Earth/ Moon System | 8,10,19,37 | 19,37A,37B,45 | 8A,8B | Go:book:solar:eclipse 1-4 |
| Feb. 5 | 7 | Timekeeping & Navigation | 9 | | | |
| 7 | 8 | History of Astronomy (project progress report due) | 11,12 | 11A,11B, 12A,12B | 11,12A,12B | Go: Earth centric |
| 12 | 9 | Motion of the Planets* | 14,15,16,17,18 | 16A,16B,18 | 16,18A,18B | |
| 14 | 10 | Test # 1 (classes 1-9); Mercury | 32,33,34,38 | 33A,33B, 33C,38 | 32,34 | Go: inner solar system |
| 19 | 11 | Venus and Mars | 39,40,48 | 39 | | |
| 21 | 12 | Jupiter* | 42,43 | 43 | 42 | Go: outer solar system |
| 26 | 13 | Saturn, Uranus, Neptune | 44 | 44 | | Go: book: planets:Saturn |
| 28 | 14 | Comets and Asteroids | 41,45,46, 47 | 41A,41B,47A,47B,47C | 31 | Go:book:planets:asteroids |
| Mar 11 | 15 | The Sun | 49,50,51 | 49,50,51A,51B | | |
| 13 | 16 | Nature of Light | 21,22,23,24,25 | 21A,21B,21C | 23,24 | |
| 18 | 17 | Stellar Spectra* | 52,53,54,55 | 25,52,54 | 25,52,55 | Window: HR diagram |
| 20 | 18 | H-R Diagram | 57,58 | 57 | 58 | |
| 25 | 19 | Stellar Properties | 59,60,61 | 59 | | Go: solar neighborhood |
| 27 | 20 | Stellar Mass | 56 | 56 | 56,34 | |
| Apr. 1 | 21 | Test #2 (classes 10-20); Variable Stars* | 62,63 | 62 | | |
| 3 | 22 | Nebulae, Clusters* & Milky Way | 69,70,71,72,73 | 70,71,73 | | |
| 8 | 23 | Stellar Genesis* | 64,65,66,67,68 | 65,67,68 | 67 | |
| 10 | 24 | Galaxies | 74,75,76 | 74 | | |
| 15 | 25 | Quasars | 77,78 | 81 | 78A,78B | |
| 17 | 26 | Term Project Presentations | | | | |
| 22 | 27 | The Universe | 79,80,81 | 79 | | |
| 24 | 28 | Cosmology | 82,83,84 | 82 | 82 | |

* Indicates laboratory activities scheduled **Bold:** more important chapters.

The dates are only suggestive since the class may run ahead or behind the proposed syllabus. The sequence of topics, however, will occur in the order proposed here. Exam #1 and exam #2 will be scheduled according to the sequence rather than the dates. Copies of previous lecture tests are kept on reserve in the library.

Final Exam: Classes 20-30 emphasized, but exam is comprehensive. When scheduled by the Registrar.

COMPUTER PROGRAMS ON THE MORAVIAN INTRANET

On all Moravian public computers at "Start – Programs – Moravian Courseware – Astronomy Programs –"

Most astronomy programs can be downloaded from "My Computer – S drive – Moravian Courseware – Astronomy Programs -"

PUBLISHER'S INTERNET RESOURCES: Available from <http://www.mhhe.com/schneider>

TEXT: Pathways to Astronomy, Schneider and Arny, McGraw Hill Publishing, 2007.

NECESSARY EQUIPMENT:

Protractor of the type shown in class, metric rule, and pencil with eraser. Please carry this equipment to class as a matter of routine.

ATTENDANCE POLICY:

Attendance will be taken in each class period. Unexcused absences in excess of three will reduce the final average of a student at a rate of 1% per absence. Students have the responsibility to secure and present evidence of the nature of excused absences.

**FINAL
GRADE:**

| | |
|------------|---|
| 30% | average of homework and laboratories (the one lowest grade will be dropped) |
| 20% | lecture test 1 |
| 20% | lecture test 2 |
| 20% | final exam (comprehensive, emphasizing last part of course) |
| <u>10%</u> | term project |
| 100% | |

HOMEWORK AND LABORATORY ASSIGNMENTS:

All laboratory and homework assignment are due within one week from the time the assignment is made. Assignments will be accepted one class period later than the time limit, but a penalty of 20 points will be subtracted from the score (except in those cases where an excused absence applies). Assignments later than indicated above will not be accepted. All homework assignments and laboratories are to be done in pencil. The policy on academic honesty, as stated on the appropriate pages of the most recent version of the *Student Handbook*, will apply to all graded portions of this course.

TERM PROJECT:

Each student will complete a project that involves observations over the course of the semester. Students may select one project from a list that will be supplied, or they may propose a project of their own design. All term projects represent work done by individual students; no group projects are permitted. Each project requires the student to (1) observe astronomical phenomena to gather data, (2) organize and present the data, and (3) make reasonable deductions based on the data.

The grade will be determined by the person's ability to do the three steps outlined above. The term project should be selected by the third class period. A progress report on the project is due by the 8th class period. A final written report and a short oral report to the class are scheduled for the third-last class period of the semester.

OBSERVATION SESSIONS:

On several occasions during the semester the class will go to the telescope platform on the upper roof of Collier Hall of Science for telescopic observation sessions. On cold nights, which are characteristic of winter evenings that are clear, you should dress warmly for class and wear a hat and gloves because we may be outside on the roof for as long as two or more hours. These observation sessions are usually spontaneous because they are based upon the prevailing weather, the current sky conditions, the available celestial objects, and the material currently or previously covered in the course.

Course Objectives: Students will understand and/or demonstrate the following:

- the basic elements of time, date, seasons, positional coordinates, and observed celestial motions
- the appropriate methods by which celestial objects and systems are observed, studied, presented, and analyzed
- the use of the telescope for making astronomical observations
- a reasonable sense of scale concerning sizes, distances, brightness, masses, speeds, forces, and processes
- application of appropriate fundamental scientific principles to study celestial objects and systems
- the interaction and evolution of celestial objects and systems through time