ASTR181: Principles of Astronomy II
Spring 2014: January 13–May 17
MWF 10:00 AM–10:50 AM, Room: STB 225

Draft 3: June 27, 2014 (subject to change)

Instructor:	Kathy Cooksey, Ph.D., STB 219; kcooksey@hawaii.edu; 808-932-7195
Office Hours:	M 2–3 PM, W 3–4 PM, R 10–11 AM, and by appointment
Websites:	Laulima ASTR-181-001 (HIL.15331.SP14); `http://www.masteringastronomy.com`, course UHHASTR181SPR14
Textbook:	*The Cosmic Perspective,* ***7th Ed.*** by Bennett, Donahue, Schneider, and Voit, **with** `MasteringAstronomy`

Course Description: A survey of modern stellar, galactic, and extragalactic astronomy, with emphasis on the underlying physical principles. Topics covered include stellar structure, interstellar environments and the formation of stars, stellar evolution and death, the structures of galaxies, and cosmology. Intended for science majors and prospective science teachers. The student should have a good operational familiarity with high school algebra. (CRN: 15331, Section: 001)
Pre-requisites: ASTR 180

Course Goals:

1. Understand how astronomers know what they know about the universe.
2. Form a conceptual framework of the content, structure, and evolution of the universe.
3. Practice and improve problem-solving skills.
4. Learn/practice "reading" equations and figures for information.

Email, Textbook, and Websites:

- UHH considers email and Laulima an official form of communication; students are responsible for receiving and returning information in a timely manner.
- The student must ensure that the instructor has her/his correct email address.
- The required textbook is *The Cosmic Perspective,* ***7th Ed.*** by Bennett, Donahue, Schneider, and Voit, **with** `MasteringAstronomy`.
- Students **must** purchase a `MasteringAstronomy` student acces code (if you do not have one from ASTR180) and sign up at: `http://www.masteringastronomy.com`. The course ID is UHHASTR181SPR14. Please enter your UH email as your student ID when registering
- The Laulima course website is listed under ASTR-181-001 (HIL.15331.SP14). This site will be the hub for all course information.

Class Rules:

1. Students are responsible for their own learning, which includes preparing for class, submitting work, asking questions, seeking additional help.
2. Students should be respectful and supportive of their peers' learning, which means*helping* each other with difficult concepts but *not* just giving the answer.

3. Students should convey (either in person, by email, through an intermediary, or somehow) to the professor questions, comments, and concerns about the course.
4. The professor should be receptive to and respectful of the students' needs and interests and should generally follow the class rules as detailed for the students.
5. **Sign in each class.** There will be an attendance sheet. Participation is part of the grade, and this is one component of that.
6. Bring an **ABCD voting card** to each class. If you lose your copy, search the internet for "ABCD_VotingCard.pdf" or go to Laulima and print another one.
7. A calculator is not necessary for every class, though it may often come in handy.

General Course Outline (*Subject to Change*):

Week 1: January 13–17: Properties of light (Ch. 5)

- Review Ch. 5: Light and Matter this week
- Read "Misconceptions about the Big Bang" by Lineweaver & Davis, *Scientific American*, 2005, Vol. 292, pp 24–23 (ISSN: 0036-8733) by **Jan 22nd**. Available at Mookini.

Week 2: January 22–24 (20th: MLK Day): Overview of the universe (Ch. 20, 22, 23)

- Monday the 20th (yes, MLK Day): `MasteringAstronomy` Ch. 5 "due" (optional)

Week 3: January 27–31: The Sun (Ch. 14)

- Monday the 27th:
  - `MasteringAstronomy` **reading quizzes begin**
  - Quiz #1: Light & Cosmology (Ch. 5, "Misconceptions about the Big Bang")
- Wednesday the 29th:
  - `MasteringAstronomy` math review "due" (optional)
  - Homework #1 (dimensional analysis, scale model) due
- Friday the 31st: Current Events in Astronomy. Everyone finds a news story or recent publication to summarize for the class in 5 minutes. Slides optional. Sign-up on the course Wiki.

Week 4: February 3–7: Fundamental physics (Ch. S4)

- Monday the 3rd: Current Events in Astronomy (cont'd)
- Wednesday the 5th: In-class problem-solving #1: Fundamental Physics

Week 5: February 10–14: Stars (Ch. 15), Stellar evolution (Ch. 16)

- Wednesday the 12th:
  - In-class problem-solving #2: Stars (also part of Homework #3)
  - Homework #2 (blackbody radiation, nucleosynthesis) due

Week 6: February 19–21 (17th: President's Day): Stellar evolution (Ch. 16)

- Wednesday the 19th: In-class problem-solving #3: Stars

Week 7: February 24–28: Stellar evolution (Ch. 17)

- Wednesday the 26th:
  - In-class problem-solving #4: Stellar Evolution (also part of Homework #4)
  - Homework #3 (parallax error, binary systems) due
- Friday the 28th: Current Events in Astronomy (half the class)

Week 8: March 3–7 : Stellar evolution (Ch. 18), Content synthesis

- Wednesday the 5th: Quiz #2: Light & Stars (Ch. 5, S4, 14–17)

Week 9: March 10–14: Milky Way Galaxy (Ch. 19)

- Wednesday the 12th:
  - In-class problem-solving #5: Milky Way Galaxy (also part of Homework #5)
  - Homework #4 (stars) due

Week 10: March 17–21: Galaxies (Ch. 20)

- Wednesday the 19th: In-class problem-solving #6: Galaxies

Spring Break: March 24–28
Week 11: March 31–April 4: Galaxy evolution (Ch. 21)

- Monday the 31st: Current Events in Astronomy (other half of class)
- Wednesday the 2nd:
  - In-class problem-solving #7: Galaxy Evolution (also part of Homework #6)
  - Homework #5 (Hubble's Law) due

Week 12: April 7–11: History of universe revisited (Ch. 22)

- Wednesday the 9th: Quiz #3: Galaxies (Ch. 18–21)

Week 13: April 14–16 (18th: Good Friday): General relativity (Ch. S3)

- Wednesday the 16th:
  - In-class problem-solving #8: Big Bang & GR (also part of Homework #7)
  - Homework #6 (galaxy sizes and Big Bang) due

Week 14: April 21–25: Future of universe revisited (Ch. 23)

- Wednesday the 19th: In-class problem-solving #9: Future of Universe
- Friday the 25th: Current Events in Astronomy

Week 15: April 28–May 2: Course synthesis

- Monday the 28th: Current Events in Astronomy (cont'd)
- Wednesday the 30th:
  - Quiz #4: Evolution of Universe, General Relativity (Ch. 22, S3, 23)
  - Homework #7 (universe) due

Week 16: May 5–7: Astrobiology (Ch. 24)
Finals Week: May 12–16: Final is Wednesday, May 14th, 9:40–11:40AM

There will be a `MasteringAstronomy` reading assignment due before the start of the first class each week (i.e., Monday or Wednesday). The goal is to read a chapter one week and resolve outstanding questions the following week. The students are responsible for re-reading parts of the chapters they didn't understand during the week of lecture on that chapter.

Grading:

- The grade depends on the following items: homework assignments (45%); in-class participation including pre-lecture reading assignments on `MasteringAstronomy` (20%); quizzes (20%); and the final exam (15%).
- **There will be no make-up work** other than the final exam.
  - If you are excused, any graded work will *not* be included in your final grade. For example, if you are excused from a lecture with a quiz, neither the in-class participation nor quiz points will be included in your total points.
    - Note: it is *not* to a student's advantage to have a lot of excused work. More excused work means each graded work has a larger impact on the final grade.
  - If you must miss a class for a "reasonable reason," email the professor *before* the start of class time. Emails are time-stamped.
    - Defining "reasonable reason" is tough because Life happens in diverse ways—illness, emergencies, utter transportation fails.[1] However, these Life happenings are *irregular*; the professor may get suspicious or even un-excusing of *patterns*.
  - If you are unable to email in advance due to *extreme* circumstances, contact the professor as soon as possible. Such instances will be judged on a case-by-case basis.
  - If you manage to be excused from all points in a given category, the percentage of the other categories will be increased to fill the void. Nature abhors a vacuum.
- **Homework assignments are never excused** since their due dates are known in advance. If you are unable to hand in your assignment, it is your responsibility to get it in somehow, either by giving it to another student to submit or by scanning and emailing it to the professor.
- **Late homework is accepted within 24 hours of the deadline** for 75% credit.
- Group work is encouraged in class and for homework assignments. However, all submitted work must be in your own words *and* writing with reference to whom your partners were.
- All references (e.g., websites, books other than the official course textbook, etc.) used to complete assignments must be cited, including numbers, techniques, facts, etc.
- **Cheating is not tolerated.** Any question of cheating will be tested with an oral exam, to see whether the student(s) involved understand the material.
- The letter grade will be given based on the chart below:

Advising: Advising is a very important resource designed to help students complete the requirements of the University and their individual majors. Students should consult with their advisor at least once a semester to decide on courses, check progress towards graduation, and discuss career options and other educational opportunities provided by UH Hilo. Advising is a shared responsibility, but students have final responsibility for meeting degree requirements.

Grade	% Required
A	≥ 93
A−	$[90, 93)$
B+	$[87, 90)$
B	$[83, 87)$
B−	$[80, 83)$
C+	$[77, 80)$
C	$[73, 77)$
C−	$[70, 73)$
D	$[60, 70)$
F	< 60

where e.g., $[90, 93)$ means $\geq 90\%$ and $< 93\%$.

[1] "Mental health days" are totally understandable, but they aren't an excusable reason.