

**ASTRONOMY 001 Section 1 Spring 2025**  
**Tue/Thu 12 – 1:30 pm, DRL A6**  
**Syllabus + Info**  
**Professor Bernardi**

**TEXT: *The Cosmic Perspective, 9/e.***

Homeworks, are posted on Canvas and have to be completed/submitted online.  
The tutorials can be previewed on the web at [www.masteringastronomy.com](http://www.masteringastronomy.com)

| <b>Date</b><br><b>Lecture #</b> | <b>Bennett</b>  | <b>Tutorials</b>   | <b>Homework and Exams</b>                           |
|---------------------------------|---|--|---|
| Jan 16<br>#1                    | Ch 1: A modern view of the Universe   | Scales of the Universe   |   |
| Jan 21<br>#2                    | Ch 2: Discovering the Universe for Yourself   | Seasons  | Homework #1 OUT<br>Chap. 1, 2, 3                    |
| Jan 23<br>#3                    | Ch 2: Continued   | Phases of the Moon<br><br>Eclipses   |   |
| Jan 28<br>#4                    | Ch 3: The Science of Astronomy<br>S1: sections: 1   |  |   |
| Jan 30<br>#5                    | Ch 3: Continued   | Orbits and Kepler's Laws   |   |
| Feb 4<br>#6                     | Ch 4: Making Sense of the Universe  | Motion and Gravity   | Homework #1 DUE<br><br>Homework #2 OUT<br>Chap 4, 5 |
| Feb 6<br>#7                     | Ch 5: Light and Matter  | Light and Spectroscopy<br><br>Doppler Effect                                 |   |
| Feb 11<br>#8                    | Ch 5: Continued   |  |   |
| Feb 13<br>#9                    | Ch 6: Telescopes  | Telescopes   | Homework #2 DUE                                     |
| Feb 18<br>#10                   | Ch 7: Our Planetary System<br>Ch 8: Formation of the Solar System<br><br>Review for first midterm | Formation of the Solar System<br><br>Detecting Extrasolar Planets            | Homework #3 OUT<br>Chap 6, 7, 8, 9, 10, 11, 12, 13  |
| Feb 20                          | First midterm: 12 pm – 1 pm in class<br>Chapters 1, 2, 3, S1, 4, 5                                |  |   |
| Feb 25<br>#11                   | Ch 9 - 10: Planetary Geology & Atmospheres: Earth and the Other Terrestrial Worlds                | Shaping Planetary Surfaces<br><br>Surface Temperature of Terrestrial Planets |   |

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|---------------------------------|--|----------------------------|---|
| Feb 27<br>#12                   | Ch 11: Jovian Planet Systems   |                            |   |
| Mar 4<br>#13                    | Ch 12: Asteroids, Comets and Dwarf Planets<br>Ch 13: Other Planetary Systems                     |                            |   |
| Mar 6<br>#14                    | Ch 14: Our Star  | Nuclear Fusion in the Sun  |   |
| Mar 11 and 13                   | <b>Spring Break</b>  |                            |   |
| Mar 18<br>#15                   | Ch 15: Surveying the Stars   |                            | Homework #3 DUE<br><br>Homework #4 OUT<br>Chap 14, 15, 16, 17 |
| Mar 20<br>#16                   | Ch 15: Continued<br>Ch 16: Star Birth  | The H-R Diagram            |   |
| Mar 25<br>#17                   | Ch 17: Star Stuff  | Stellar Evolution          |   |
| Mar 27<br>#18                   | Ch 18: The Bizarre Stellar Graveyard<br>S3: sections 1, 2, 3 and 4                               | Black Holes                |   |
| Apr 1<br>#19                    | Ch 18: Continued<br>Review for second midterm  |                            | Homework #4 DUE   |
| Apr 3                           | Second Midterm: 12 pm – 1 pm in class<br><br>Chapters 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 |                            |   |
| Apr 8<br>#20                    | Ch 19: Our Galaxy  |                            |   |
| Apr 10<br>#21                   | Ch 20: Galaxies and the Foundation of Modern Cosmology<br>Ch 21: Galaxy Evolution                | Measuring Cosmic Distances | Homework #5 OUT<br>Chap 18, 19, 20, 21, 22, 23                |
| Apr 15<br>#22                   | Ch 20-21: Continued  | Hubble's Law               |   |
| Apr 17<br>#23                   | Ch 22: The birth of the Universe   |                            |   |
| Apr 22<br>#24                   | Ch 22: Continued   |                            |   |

| Date            | Bennett  | Tutorials  | Homework and Exams |
|-----------------|--|--|--------------------|
| Lecture #       |  |  |                    |
| Apr 24<br>#25   | Ch 23: Dark Matter, Dark Energy and the Fate of the Universe | Detecting Dark Matter in Spiral Galaxies<br><br>Fate of the Universe |                    |
| April 29<br>#26 | Review   |  | Homework #5 DUE    |
| May             | FINAL EXAM:<br>Cumulative                                    |  |                    |

## COURSE INFO

**Instructor: Mariangela Bernardi**

**Office:** DRL 4N2b

**Contact Information:**

E-mail: [bernardm@sas.upenn.edu](mailto:bernardm@sas.upenn.edu)

**Class Time/Room:** Tue/Thu 12 – 1:30 pm, DRL A6

**Text:** The Cosmic Perspective, 9th Ed.

**Webpage/Syllabus:** <http://canvas.upenn.edu/>

**Office hours:** By appointment (just email me)

We can meet in my office (DRL 4N2b) or use Zoom

**Join Zoom Meeting:**

<https://upenn.zoom.us/my/bernardm>

or Meeting ID: 7023995066

This course will be taught **in person**. All the material will be posted on Canvas (except for the Tutorials which are on the masteringastronomy.com website – see below). Assignments have to be completed/submitted online as .pdf files (on Canvas).

**Slides** will be posted on Canvas prior to each nominal class date as listed in the syllabus. To see the slides click on “Files”.

**Grading:**

- Exam 1: 15%; Exam 2: 15%; Final exam: 30%
- Homework: 15%
- Observing Lab: 5%
- Tutorials: 10%
- In class questions: 10%
- Total: 100%

- **Exams:** Two midterms and one final. The final exam is cumulative (i.e. it will cover the material of the full semester).

**Midterm #1:** Thursday February 20, 12 pm – 1 pm ET (in class)

**Midterm #2:** Thursday April 3, 12 pm – 1 pm ET (in class)

**Final:** May

- **Homework:** Schedule on syllabus. Assignments/solutions posted on Canvas.  
Assignments will typically consist of about 10 problems.  
Solutions will be posted soon after the homework is due.  
No late homework will be accepted.  
Each homework problem is worth 4 points, and is graded on the following scale:
  - 0 (missing or totally wrong)
  - 1 (something there, mostly wrong)
  - 2 (good try, partly right)
  - 3 (almost, but not quite, correct)
  - 4 (totally right)

- **Observing Lab:** To be scheduled during the semester. Telescope- and computer-based exercise.

- **Tutorials and in class questions:**

**Each student MUST register for a Student ID on the Pearson website**  
(<http://www.masteringastronomy.com/>).

The Course ID is: **bernardi56584**

- Students Registration Instructions are
  - provided on Canvas (see [MastringAstronomy\\_Students\\_Registration\\_Instructions.pdf](#))
  - included with your text
- Make sure you pick the right book (THE COSMIC PERSPECTIVE, 9th Ed.)!

**Tutorials:** The tutorials are worth a total of 10% of the final grade. The tutorials are divided in three sets. Each set must be completed by the due date (given on the webpage; the due date corresponds to the date of the first, second and final exams). Students are responsible for following the syllabus and completing the tutorials. No grade is assigned, just a check to see if it was done.

**In class questions:** during each lecture students will have to answer a few questions related to the material using their laptops or phones. These are worth a total of 10% of the final grade (half of this is participation and half is correctness). For this you can directly login to <https://learningcatalytics.com/> using the same Student ID and password of the Addison-Wesley website <http://www.masteringastronomy.com/>