Fall 2014 Physics 101 Elementary Astronomy

Professor
Dr. Jared Workman

Class Location
Dominguez Hall 104

Class Hours
Section 001: Mon Wed Fri 1:00-1:50

Text Book
Cosmic Perspective, 6th Edition With Mastering Astronomy, Bennet et al.

http://myhome.coloradomesa.edu/~jworkman/teaching/fall14/101/index101.php
If you ever forget the link to this site go to www.jaredworkman.com and scroll down to the "My Colorado Mesa University Webpage" link.

Welcome to Physics 101, Elementary Astronomy

This syllabus is your guide to class policies and procedures as well as a tool for planning. Each student is encouraged to work with the instructor and their peers. My own background is in theoretical/computational astrophysics which means I did my work on a computer and not in front of a telescope. My goal for this course is to introduce you to astronomy and much of the fascinating material it contains. We will take a tour through the history of astronomy, our skies, our solar system and planetary atmospheres, stars, galaxies, cosmology, and astrobiology. I am particularly fascinated by astrobiology. We are living in an era of unprecedented advances in astronomy driven by advances in observational techniques, computing power, and the great orbiting observatories. One thing you may not be aware of is that we have found close to 1000 planets orbiting other stars. As we speak there is an observatory trailing the earth in our orbit looking at 145,000 stars in the Cygnus constellation looking for potentially habitable planets.

This course will be mostly non-quantitative however there WILL be some math in the form of simple power laws and ratios. I want you to experience some of the wonder I do when my mind and eyes drift out into the night sky. I want this course to be fun for you so I am not going to give you particularly onerous homework assignments or exams but you will be doing a lot of reading. You need to keep up with the reading to pass this course.

If you have a topic you find particularly interesting come to me and I'll try to cover it. This course deals with huge stars dying and exploding, some of them outshining their host galaxies, others synthesizing every element heavier than iron. We will talk about black holes, the beginning of our universe, possible life in the universe, and much more. I only ask that you keep up with the reading and come along on an introductory journey into the universe beyond our little pale blue dot.

Course objectives

Learn (Topical Course Outline)

- The History of Astronomy
- How We Observe The Universe & The Nature Of Light
- A Bit of Physics, Gravity, Newton, Angular Momentum, & More
- The Day & Night Sky
- The Tides, The Seasons, Eclipses, & Phases of the Moon

- Our Solar System, Its Origins and Constituents and Planetary Atmospheres
- Stars - From Birth to Death and how we tell them apart and what their properties are
- The Cosmic Distance Ladder
- Galaxies - How they formed, what they are
- Cosmology and large scale structure
- Extrasolar Planets & The Possibility Of Life Elsewhere In Our Galaxy (Astrobiology)

Goal

The main objective of this course is to gain deeper understanding of the universe around us, its origins, fate, and constituents, and gain an understanding of the scientific method.

CMU Catalog Description

Introduction to astronomy. Survey of topics such as observational astronomy, the solar system, stellar astronomy, galaxies and cosmology. Emphasis on basic conceptual aspects of astronomy. ***Minimal use of elementary mathematics such as basic arithmetic, fractions, square roots and powers.*** *The course is designed for students in all majors.*

What to look for in this syllabus

- How to contact me
- Evaluation (grades)
- Mastering Astronomy &Homework
- Exams
- Observing Sessions
- Reading Schedule & Attendance
- Class Notes
- Resources for student assistance
- Student Success at CMU
- Student Conduct
- Important Dates
- Course Learning Objectives
- Student Learning Objectives
- Work Load

How to Contact Your Instructor

Visit my office: WS 230C
Office Hours: Mon Tue Wed 10:00-11:00, Friday 10:00-12:00, or by appointment
Leave me a message at: (970)-248-1327
Email me at: mailto:jworkman@coloradomesa.edu

Evaluation

Homework 35%
Exams 65%
Attendance – see below

Grading

Grades will be assigned as follows:

Excellent	A	> 90%
Good	B	80%-90%
Average	C	70%-80%
Deficient	D	60%-70%
Failing	F	< 60%

A curve may be used at the end of the semester. This is at my discretion. I can be contacted at any time to give you an update of your current grade.

Mastering Astronomy and Homework

You must register for Mastering Astronomy to pass this course. The homework assignments there will constitute 35 percent of your grade. All students musts be registered by the first Friday of the semester or suffer a homework grade penalty.

Homework will be assigned on Mondays on the Mastering Astronomy website. It will be due the following Monday by the beginning of class. Late homework is not accepted.

The homework will not always match the material in class. It is meant to complement AND supplement the in class material. You will need to be doing the reading to do the homework.

The **Mastering Astronomy website** is the most popular astronomy textbook site available to students. The core of the website - the highly acclaimed and award-winning **Tutorials** - feature a comprehensive collection of interactive and animated study aids for self-paced learning, each built to address key areas of learning difficulty. The site also features narrated animations, movies, interactive figures from the text, chapter-specific quizzes, chapter summaries and overviews, web links, and more. The Mastering Astronomy website will help you improve your grades when you use it regularly.

You will need an access code to register for The Mastering Astronomy website. You can get a 12-month access code in two ways:

1. **The Mastering Astronomy site is free when you purchase a new textbook.** You will find a Student Access Kit in the front of your textbook.
2. **Purchase access online with a credit card**, if you bought a used book. Go to http://www.masteringastronomy.com , choose your text, and click on the "**Buy Now"** button. The cost is $65.

Once you have your access code, check the Site Requirements and then follow the Step-by-Step Registration Instructions below. You only register ONCE to create your personal login name and password. You will log in subsequently using the personal login name and password you created.

Site Requirements

You'll find everything you need to optimize your computer for use of this website on the Site Requirements page, including system requirements, links to update your web browser, and links to update your plug-ins. (You need Shockwave Player 8, Flash

Player 7.0 and QuickTime 6.0.) **To see the Site Requirements page, click on "Site Requirements" near the bottom of the Login screen.**

Step-by-Step Registration Instructions

1. Go to **www.masteringastronomy.com**
2. Click on the cover of your text.
3. Under **"First-Time User?",** click on **Register**.

STEP 1: Access Information Screen

4. **Do You Have a Pearson Education Account? section**: If you've already registered for an online product published by Addison Wesley, Allyn & Bacon, Benjamin Cummings, Longman, or Prentice Hall, type in your Login Name and Password under "Yes, Look Me Up". If not, select "No, I Am a New User".
5. In the **Access Code section**, enter the 6-word access code (from your textbook) in the boxes.
6. In the **School Location section**, type in your School Zip or Postal Code and select your School Country.
7. Click Next.

STEP 2: Account Information Screen

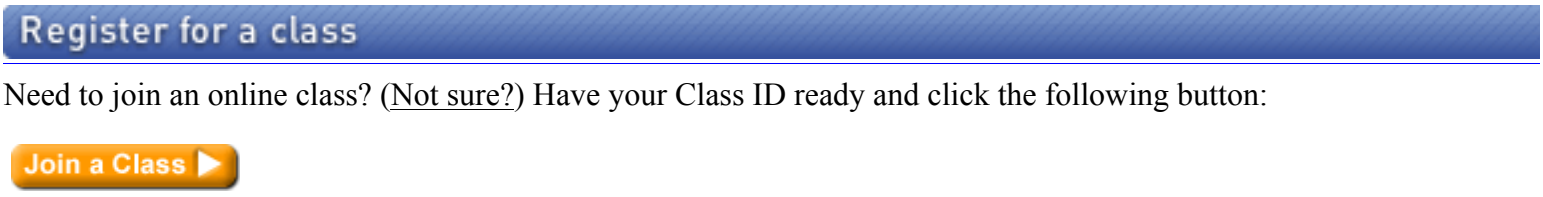
8. In the **Personal Information section**, type in your First Name, Last Name and E-mail Address. Use you S-number when asked for your student id.
9. In the **School Information section**, choose your school from the pull-down menu.
10. In the **Login Name and Password section**, create your own personal login name and password. Re-type your password.
11. In the **Security Question section**, choose a security question from the pull-down menu and fill in your answer.
12. Click Next.

STEP 3: Confirmation & Summary Screen

13. Once your login name and password have been accepted, you will see a Confirmation Summary page. You'll also get an email with this info. You may want to print out this information for future reference.

Register For a Class

On the Confirmation & Summary screen, you will see the following:



- ***YES*** ***If your instructor has created an online class,*** clicking Join a Class prompts you to complete a few more registration steps, including entering the Class ID supplied to you by your instructor. You will not be able to join a class now if you do not know the Class ID. If you do not have a Class ID, contact your instructor to get it. You can join a class later, once you have your instructor's Class ID.

- ***NO – Jared Workman has created a class (see above). Only do this if you DON'T want your work recorded.*** ***If you are unsure whether you should be joining an online class or not,*** ignore this option. You do not need to enroll in an online class

to use the educational website. You can always join an online class later (if available), by logging into the educational website, clicking Join a Class, and supplying the Class ID then.

WORKMAN2014
Join the one which corresponds to the section you are in

Step-by-Step Log In Instructions

1. Go to www.masteringastronomy.com
2. Choose your textbook. (cosmic perspective 6th edition)
3. First, **click on "Site Requirements"** near the bottom of the page, and make sure your computer meets the **system requirements** and to see if you have the **necessary plug-ins**: Shockwave, Flash and QuickTime. If you don't, click on the links to download these to your computer.
4. Click your browser's "Back" button to get back to the Login screen.
5. Under "**Established User?",** type your login name and password that you created during registration. Click the "Log In" button.
6. Choose the chapter from the pull-down menu at the top of the screen, and then choose what you'd like to explore from the menu items on the left.

Technical Support

Click on the **Tech Support button** at the top of the screen and **fill out the online product support request form.** Your information will be submitted and you will be contacted by a Product Support specialist.

WHEN YOU DO TUTORIALS, TO GET CREDIT, BE SURE THAT:

Each time you log in there should be, in the UPPER RIGHT hand of the screen:

Welcome <your name>

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If you don't see this, and you HAVE followed the registrations instructions, contact tech support at masteringastronomy (you can click "tech support" near the top of the screen) AND confer with another student or your TA. Most students are able to register ok.

WHEN YOU DO THE TURORIALS, you must check YES on the first screen that comes up , "Do You Want to Record Your Work/Scores for this Tutorial?" WHEN YOU FINISH, YOU MUST ALSO CHOOSE "**SUBMIT.**" This sends your results into the class gradebook

Exams

There will be two to three exams and a final exam. The first exams will not be cumulative, the final will be cumulative. Each of the first three exams will be worth 15 percent of your grade, the final exam will be 20 percent of your grade. Exam material will be taken from the reading and the lecture notes with the emphasis on lecture notes which will be posted and revised frequently. Exam dates will be mentioned in class, I am not posting hard dates in the syllabus.

The exams will be open note, bring as many pages as you like, do not print mine out and bring them, bring your own notes.

If you miss an exam you will receive a zero for it unless you have sufficient documentation to excuse the miss and this documentation is accepted by student services. Acceptable reasons include hospitalization, doctor verified illness, or deaths in the family.

I will replace your lowest exam grade (except for zeros from missed exams) with your final exam grade if the final exam grade is higher.

I will NOT be asking you to remember exact numbers but you should know scales. If the earth is one astronomical unit from the sun I expect you to know the solar system is ~100 astronomical units across, our galaxy is ~50,000 light years across, the distance to the Andromeda galaxy is ~2.5 million light years, etc. I will not ask you to memorize the sun's mass but I will expect you to remember it is 100 times larger than the earth and a million times more massive, etc.

The Final Exam will be held from 1:00-2:50, Wednesday, December 10th.

Attendance

I do not keep attendance as part of the grade but I may keep an attendance sheet to sort out the students who are frequently absent. If you choose to miss class on a regular basis it is likely that you will fail the course and I do not want to be approached after several absences and asked what you can do to pass the course.

Reading Schedule

This is a tentative schedule, I may spend more or less time or skip topics entirely depending on class progress. I am trying to keep the reading to approximately 40 pages a week. If you do the reading and take notes you will, (in all likelihood) pass this course. If you do not do the reading you will very likely fail this course. If you do not understand the mathematical insight sections don't worry. I will go over the portions that I want you to know in class. The exam dates

Chapters 1,2,3,4,5,6,7,13,14,15,16,17,18,19,20,21,22,23,24

Resources for Students

Your instructor: I am here to help you learn; please let me know if you are having trouble with anything! My contact information is at the top of the syllabus, or you can talk to me after class or during my office hours.

The Course Website: Contains all class information and several helpful (and some just fun) links.

Tutorial Learning Center: HH113 http://www.coloradomesa.edu/tutoring/index.html

Students With Disabilities: Students with disabilities have certain privileges extended to them including but not limited to extended exam time. It is your responsibility to contact the EAS (Educational Access Services) At Houston Hall, Room 108, 1-970.248.1856 http://www.coloradomesa.edu/eas/links.html and bring me the necessary forms for any special dispensations received.

Student Success at CMU

http://www.coloradomesa.edu/academics/documents/StudentSuccessatCMU_WCCC.pdf

Class Policies

All students expected to follow the Student Code of Conduct. Violations of the Student Code of Conduct may result in disciplinary action. The code of conduct is here here http://www.coloradomesa.edu/academics/policies/academic_integrity.html. Some specific items that are important in this class are:

1. Don't call me mister, it's Dr. Workman.
2. Create and sustain a respectful learning environment. Allow your fellow students to learn and the instructor to teach. Disrespectful, disruptive or abusive behavior toward an individual or group is unacceptable. If you disrupt your classmates I will throw you out of the class permanently.
3. Due to the rapid pace of this course, late work is generally not accepted. In the event of illness, family emergency or other special circumstances, you must contact me BEFORE the deadline to make arrangements for late work or early tests. At the instructor's discretion, you may then turn in the work within 1 week of the deadline.
4. I encourage participation, ask questions, email me, ask for reading material for your own edification after the course is over, provide me with feedback. I am not directly grading you on participation but it will play a factor in the end of the semester grade. This is an interesting topic and I want you to be involved in learning it.
5. Turn off your cell phone.
6. No smart phones, ipads, earphones, etc during class time, no texting or web browsing. You all get one freebie phone ring then I may ask you to leave.
7. Laptops are fine for note taking but please do not web surf during class. If I find you surfing the web you forfeit your laptop privileges. Students using laptops are required to sit at the front of the class.
8. I will turn any students I find cheating, copying each other's work, or plagiarizing material over to the department chair, no exceptions. If you are unsure if something is prohibited, ask me. You are encouraged to work together but please do not hand in identical assignments, they will not be accepted.
9. Please arrive to class on time and wait until class is over to leave. I will remove students who regularly arrive late.
10. It is your responsibility to learn of any missed work.
11. Don't talk during class, raise your hand whenever you want to but don't talk, I reserve the right to kick you out of the course for talking.

Important dates:

http://www.coloradomesa.edu/registrar/dates.html

Course Learning Objectives:

1. describe and classify various celestial objects,
2. explain qualitatively phenomena that can be observed with the naked eye such as seasons and eclipses,
3. describe major historical developments from ancient astronomy to those of Newton,
4. explain qualitatively astronomical phenomena and observations in terms of the underlying physics,
5. explain qualitatively the operation and limitations of telescopes,
6. describe and explain qualitatively the properties of the solar system, its planets and its moons,
7. describe and explain qualitatively the properties the sun,
8. explain qualitatively the properties of stars, stellar evolution,
9. describe and explain qualitatively the properties of galaxies, and

10. describe the tenants of modern cosmology and the history and possible fates of the universe.

Student Learning Outcomes

The physics program has several learning outcomes that will be attained by graduates of the program; this course contributes to the attainment of these two objectives

1: Understand the structure and discipline of mathematical thought and its use in problem-solving;

2: Have knowledge of the natural world and an understanding of scientific methods;

Work Load Expectations:

An undergraduate student should expect to spend on this course a **minimum** of two hours outside the classroom for every hour in the classroom. The outside hours may vary depending on the number of credit hours or type of course. More details are available from the faculty member or department office and in CMU's Curriculum Policies and Procedures Manual.

Disclaimer:

The instructor reserves the right to modify the schedule. It is tentative based on class progress.