

## Fall 2015 Physics 101 Elementary Astronomy

### Professor

Dr. Jared Workman

### Class Location

Wubben Science 141

### Class Hours

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

### Text Book

Cosmic Perspective, 7<sup>th</sup> Edition With Mastering Astronomy, Bennet et al.

### Class Website

<http://org.coloradomesa.edu/~jworkman/teaching/fall15/101/index101.php>

If you ever forget the link to this site go to [www.jaredworkman.com](http://www.jaredworkman.com) and scroll down to the “My Colorado Mesa University Webpage” link.

READ THIS – I will not respond to emails asking me for information which can found in this syllabus or on the course website. Such emails will be deleted immediately. You will have reading assignments, quiz dates, homework due dates, and class notes posted on this website.

## 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
- Course Structure
- Evaluation (grades)
- Mastering Astronomy & Homework
- Quizzes
- Final Exam
- Attendance
- Resources for student assistance
- Student Success at CMU
- Student Conduct
- Important Dates
- Course Learning Objectives
- Student Learning Objectives
- Essential Learning Objectives
- Work Load

## **How to Contact Your Instructor**

**Visit my office:** WS 230C

**Office Hours:** TUE 10:00-11:00, WED 2:00-3:00, THU 10:00-11:00 & 1:30-2:30, FRI 12:00-1:00

**Leave me a message at:** (970)-248-1327

**Email me at:** [jworkman@coloradomesa.edu](mailto:jworkman@coloradomesa.edu)

## **Course Structure**

This will be a reading and lecture based course. I will post all assignments under the announcement section of my website. You will generally be given 20-40 pages of reading assignments a week and a short quiz covering this material each Monday. We will have lectures on Mondays, Wednesdays, and half of Fridays. The second half of Friday will be reserved for a special topics lecture on some current mission or discovery in Astronomy or a related scientific field. I am always happy to tailor the topical interest lecture towards specific things if people request it.

We will be using response feedback cards along with in lecture reading questions. These responses will not be graded but they should serve to let you know where you stand with understanding the material.

## **Evaluation**

Homework 50%

Quizzes 30%

Final Exam 20%

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 as your homework will all be assigned and completed on this site. The homework assignments will constitute 50 percent of your grade. All students must be registered by the first Friday of the semester or suffer a homework grade penalty.

Homework will be assigned 1-2 times per week. Check the course website's announcement section to check if new homework is posted after each class. You will generally have 3-5 days to complete an assignment. The due date will be posted on the Mastering Astronomy website. It is your responsibility to keep up with this. If you miss an assignment you get zero credit for it.

## **INSTRUCTIONS**

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.pearsonmylabandmastering.com/northamerica/masteringastronomy/>, choose your text, and click on the “**Buy Now**” button. The cost was \$65 last fall.

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 your 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:

### Register for a class

Need to join an online class? (Not sure?) Have your Class ID ready and click the following button:

Join a Class ▶

- **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.

**MAWORKMAN2015**

Join the one which corresponds to the section you are in

## Step-by-Step Log In Instructions

1. Go to [www.masteringastronomy.com](http://www.masteringastronomy.com)
2. Choose your textbook. (cosmic perspective 7<sup>th</sup> 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>

MAWORKMAN2015

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 TUTORIALS, **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

### Quizzes

There will be 9-12 quizzes given during the semester. These quizzes will be given on Mondays and will be 5-10 questions long. They will be based on the reading assignments for the previous week and the material covered in the course on the previous week. I will drop one quiz, after this, missed quizzes will be assigned a grade of zero. Quizzes will be announced on the course website. Quizzes will be 30 percent of your grade.

Quizzes are closed book, closed note. If you don't read the book, you won't pass the quizzes

### Final Exam

The Final Exam will be held from 1:00-2:50, Wednesday, December 9<sup>th</sup>. The final exam will be cumulative and is worth 20% of your total grade. The Final Exam is open note.

### 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.

### 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](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/student-services/conduct.html> . Some specific items that are important in this class are:

1. Don't call me mister, it's Dr. Workman.
2. Show up on time, if you are going to be late, do not enter the class.
3. Create and sustain a respectful and quiet 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 dis-enroll you from the course.
4. Due to the rapid pace of this course, late work is 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.
5. 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.
6. Turn off your cell phone.
7. If you are going to be using your cellphone, tablet, or laptop please sit in the back row. This will mitigate the disruptive influence this behavior imposes on other students. I reserve the right to temporarily or permanently remove a student for the continued disruptive use of electronic equipment.
8. 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.
9. 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.
10. Please arrive to class on time and wait until class is over to leave. I will remove students who regularly arrive late from the course.
11. It is your responsibility to learn of any missed work from a class mate or my web site.
12. Don't talk during class, raise your hand whenever you want to but don't talk. I reserve the right to require you to leave the class for the day or completely dis-enroll you from the course for talking during lecture.

**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;

### **Essential Learning Outcomes**

This course is part of CMU's essential learning curriculum and satisfies the following essential learning outcomes:

1. Demonstrate investigative and analytical thinking skills to solve problems.
2. Select and use appropriate information in an academic project.

### **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 and syllabus. It is tentative based on class progress.