Physics 105 - Astronomy: Stars and Galaxies
4 Credit Hours
Winter 2014
THIS IS AN ONLINE COURSE

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Virtual Office Hours: upon request - via Skype video conferencing

Course Management System: Moodle

Course (Catalog) Description: Nature and Evolution of stars, the Milky Way and other galaxies, Cosmology.
Topics include: Matter and Energy; Universal Motion; Light and Spectroscopy; Telescopes. Our Sun. The Stars: Stellar classification and evolution (birth, maturity & death of stars). Pulsars, Neutron Stars and Black Holes. Our Galaxy. Galaxies: classification & evolution. The expansion of the Universe. Basic elements of Cosmology.

Prerequisites: None

General Education Learning Outcomes: This course satisfies the university general education requirement in the Natural Science and Technology (NST) Knowledge Exploration area.
The learning outcomes for NST courses state that the student will demonstrate:

- Knowledge of major concepts from natural science and technology, including developing and testing hypotheses; drawing conclusions; and reporting of findings through some laboratory experience or an effective substitute (Laboratory experiences are met by either a limited number of interactive experiences, collecting and interpreting raw data, or other effective experiences such as a virtual laboratory). Requires at least 3 laboratory experiences during the course.
- How to evaluate sources of information in science and technology.

In addition to the general-education learning outcomes, this course also includes the crosscutting capacity of Critical Thinking.

Course Goals and Objectives: From the very onset of human civilization, kings, priests and philosophers alike have scrutinized the skies for answers. After thousands of years we still do so. On one side, with the help of more and more powerful Telescopes, astronomers are studying the dynamics of birth and evolution of Stars, the clustering of stars into Galaxies, and scrutinizing the outskirts of the Universe for new types of objects, such as Quasars. On the other side, Cosmologists seek for a theory that describes birth, evolution and future of the Universe.

The main goal of this course is fostering the appreciation of Astronomy as a science. Therefore the scientific method of research will be introduced.

The course will also introduce basic concepts of mechanics, optics, magnetism and nuclear physics as an aid to understand the processes that are ongoing in the core of the stars, etc.

The nature of this course is descriptive: therefore a very minimal amount of mathematics will be used. To deepen the understanding of concepts, though, a number of tools will be used:

- **Web Tutorials** – the web tutorials are actual online lessons that are meant to consolidate the student's understanding of main concepts. The student will have to answer a set of questions posted on Moodle for each tutorial lesson.
- **Sky Simulation Activities** – using an interactive desktop planetarium (the Voyager: SkyGazer CD), the student will reproduce events such as eclipses, seasonal changes in the sky, and phases of planets. The student will also study patterns of motion of celestial objects over very long periods of time, recreating events that cannot be experienced in a lifetime of observing. These activities will be used as virtual Laboratory experience.
- **Online Quizzes** – on the Mastering Astronomy website, include reading, concept and visual quizzes.

Textbooks: Bennett: The Cosmic Perspective: Stars and Galaxies – Edition 7/E
packaged with:

- Mastering Astronomy Access Code
- Voyager: Sky-Gazer v5.0 Access Code

Pearson Publishing – ISBN: 978-0321928177

You may choose to purchase the package

- at the Campus B&N bookstore
- at Textbook Outlet (2592 N. Squirrel Rd. @ Walton)
- online through Pearson's website
  www.mypearsonstore.com (Search the book by ISBN)
- in electronic format through Pearson's website
  www.masteringastronomy.com
  Scroll down to 'Learn about e-Textbook options' – available are:
  - NOOK Study
  - Kindle eText

Notice: *it is recommended that you purchase the complete package new.*
Used books will have a used Access Codes to Mastering Astronomy and SkyGazer, so you would have to purchase these Access Codes online.

Features: The textbook includes two important Student Supplements:

"*Mastering Astronomy Website*": featuring interactive tutorials, interactive figures and photos, mini documentaries, etc., and the electronic textbook.

http://www.masteringastronomy.com

"*Tutor Center*": provides one-to-one tutoring by qualified college instructors in the evening and weekends via phone, fax, e-mail and the Internet.

http://www.aw-bc.com/tutorcenter

Study Tips: In order to test your understanding of the concepts embedded in the chapters and also to prepare for the exams, you should test yourself by going to the ***Study Area*** of ***MasteringAstronomy.com***

The ***Study Area*** tab is at the top-right of the screen. Once in there, ***choose the chapter*** from the scroll down menu at the top and click 'GO'.

As you scroll down the page, you will see the ***Reading, Concept,*** and ***Visual Quiz***. These serve as an excellent chapter review. These quizzes are not graded, and you may take them repeatedly – for example at the end of chapter and again just before the exam.

Also, review all the ***Review Questions*** and ***Test Your Understanding*** at the end of each chapter on the textbook. Notice that the ***e-book*** is also in the ***Study Area.***

Ideally, you could work with your group of find one or two other partners and work with them at least once a week for a couple of hours on this review material.

Online Quizzes: This homework consists of online Reading Questions and Tutorials for each chapter. These are intended to help the students familiarize with the concepts introduced by the course and to help them gauge their understanding of the material.
The quizzes are found on the **Mastering Astronomy.com** website.

Please see the attached sheet on *'How to Access the Online Quizzes'*.

No late Quizzes are accepted after one week from the due date. For each late day there will be a 10% penalty.

The Homework is worth 10% of the final grade.

Chapter Questions: For each chapter one or two questions will be posted on Moodle. You are asked to work in groups of three and submit the answers by e-mail to my grader.

No late Answers are accepted after one week from the due date. For each late day there will be a 10% penalty.

The Chapter Questions are worth 15% of the final grade.

Tutorials: Tutorials are an excellent self-study tool for deepening the understanding of main concepts. There will be a total of twelve tutorials.
Tutorials are found on the **MasteringAstromomy.com** website.

Please see the attached sheet on '*How to Access the Self-Guided Tutorials*'.

I will post on Moodle a set of questions for each tutorial. You are asked to work in groups of three and submit the answers by e-mail to my grader.

No late Tutorials are accepted after one week from the due date. For each late day there will be a 10% penalty.

The Tutorials are worth 15% of the final grade.

Sky-Gazer Activities: these sky-simulation activities will serve as virtual Laboratory experiences.

Voyager Sky-Gazer is an interactive desktop planetarium program. You can load it on your computer using the Access Code bundled with your textbook.

I will provide instructions on Moodle for each Activity. The report file must be submitted by e-mail to my TA for grading.

No late Activity is accepted after one week from the due date. For each late day there will be a 10% penalty.

The Activities are worth 15% of the final grade.

Lecture Notes: Lecture notes will be available on Moddle. These can be used as a chapter summary or study-guide and are not intended to substitute the textbook.

Recorded Lectures: Power Point presentations of the lectures with voice over are available on Moodle for most chapters.

Online Exams: There will be three online exams in the form of multiple-choice questions.

The exams will take place on the **MasteringAstronomy.com** website.

These exams will have the duration of 1 hour and may be taken any time of the day on the specified date:

- Exam # 1 (Chapters 1, 3 sect.3, 4, 5, 6)
- Exam # 2 (Chapters 14, 15, 16, 17, 18)
- Exam # 3 (Chapters 19, 20, 21, 22, 23, S3)

The Online Exams are worth a total of 45% of the final grade

(Exam #1: 15%, Exam #2: 15%, Exam #3: 15%)

Syllabus Quiz: during the first week of the course, you will have to take this simple quiz, to make sure that you understand what you have to do for the course.

A nominal grade of 1 point is assigned to this Quiz (for participation).

Are you ready for Online Learning Quiz: during the first week of the course you are also required to take this short quiz to highlight whether you are fit for an online course or not. Please email the results to Dr. Castoldi.

Getting to Know each other Forum:

This Forum is meant to help all of us to get to know each other. It may also initiate conversation and friendship with other students in the course. Please answer the questions and share information about yourself with us.

Gradebook: All grades will be posted on Moodle's Gradebook.
The Gradebook will be updated regularly as new grades become available.

Final grade: The final grade will be calculated on the basis of the following percentages:

*** Online Quizzes:**	**10%**
*** Chapter Questions**	**15%**
*** Tutorials:**	**15%**
*** Sky-Gazer Activities:**	**15%**
*** Online Exams:**	**45%**

Grading:

A (4.0)	total score:	>95%
A (3.6 – 3.9)		86 – 95 %
B (3.0 - 3.5)		73 - 85 %
C (2.0 - 2.9)		60 - 72 %
D (1.0 - 1.9)		50 - 59 %

Add/Drops

The University's add/drop policy will be explicitly followed. It is the student's responsibility to be aware of the university deadline dates for dropping courses.

Special Considerations

Students with a documented learning or physical disability must contact the Office of ***Disability and Support Services***, 121 North Foundation Hall, (248) 370-3266, and inform the instructor of special needs during the first week of classes. For more information, visit **http://www.oakland.edu/dss**.

Policy on Academic Misconduct

The University's regulations that relate to academic misconduct will be fully enforced. Any student suspected of cheating and/or plagiarism will be reported to the Dean of Students and, thereafter, to the Academic Conduct Committee for adjudication. Anyone found guilty of academic misconduct in this course may receive a course grade of 0.0, in addition to any penalty assigned by the Academic Conduct Committee. Students found guilty of academic misconduct by the Academic Conduct Committee may face suspension or permanent dismissal. The full policy on academic misconduct can be found in the General Information section of the Undergraduate Catalog.

Excused Absence Policy

University excused absences applies to participation as an athlete, manager or student trainer in NCAA intercollegiate competitions, or participation as a representative of Oakland University at academic events and artistic performances approved by the Provost or designee. For the excused absence policy, see

http://www.oakland.edu/?id=6850&sid=175.

Communication:

Instructor → Student:

Communications from the instructor will happen via **News Forums** in **Moodle** (forwarded by Moodle to your Oakland g-mail account.)

The student is expected to be familiar with Moodle. The e-Learning department offers introductory sessions at the beginning of each term.

Go to:

http://moodle.oakland.edu

Click on '*Students*' at the top and choose '*Moodle Orientation*'

- Each student is expected to login at least twice a week on Moodle and check the e-mail regularly.
- A Weekly format will be used in Moodle, so that guidelines for the homework, virtual office hours and all other activities will be posted week by week.

  This means you will have to scroll down to check each week of the course.

Student → Instructor:

Contacts with the instructor will happen primarily through **e-mail** at

castoldi@oakland.edu

The subject of your e-mail should look like this:

e.g. ***'Phy 105 – Your lastname – Questions on Tutorial 1'***

I will read my e-mail twice a day on weekdays, and once a day on the weekend.

Student → Student:

Contacts among students may happen in a number of ways:

- '***Student Chat Room'*** Forum – setup on Moodle for students to initiate a chat
- '***Getting to know each other***' Forum – setup on Moodle so that each students can share some basic information about himself/herself with others and the instructor. Participation in this forum is ***mandatory***.
- '***Elluminate***' audio/video conferencing sessions can also be requested. These need to be setup by the instructor. Please email me and I can setup a session for your group. This may require the purchase of a ***headset with microphone***.

Virtual Office Hours:

The student-instructor communication can happen also via Skype video conferencing. Upon request, we can setup a **phone call** or **Skype** meeting time to solve group issues.

For **TECHNICAL ISSUES**, please contact:

Moodle:

Read the documents on the e-Learning & Instructional Support (e-LIS) website.

In particular, the '***Welcome to the Online Student Orientation'***:

http://www2.oakland.edu/elis/SO_index.cfm

If this doesn't help, contact the e-LIS at **248-370-4566**

You may also submit a Help Request Form to e-LIS:

http://www2.oakland.edu/elis/help.cfm?LMS=2

Online Quizzes:

Go to the **www.masteringastronomy.com** website

- Click on the 'Support' tab.
- Then click on 'Support for Students'.
  - You may read answers to FAQ
  - Contact Support via e-mail, phone or
  - Have a live-chat.

Important Note from the Instructor:

Online courses have numerous advantages, including flexibility for those with a busy schedule.
On the other hand I wish to bring to your attention that **not everybody is fit for an online course**.
Remember that to be fit for an online course,

- You must be able to **work independently.**
- You must feel quite **comfortable** working **with computers**.
- You must be **self-motivated** and **disciplined** in order to access all assignments in a timely manner, actively participate in discussion panels and study the textbook in a timely manner.
- You must be able to **follow directions**. Most online activities are announced with written directions. It's important that you understand what the instructor requires.
- You must be **organized**. For example, create a folder on your computer for the class. Within it create other folders for each of the class activities.

Last but not least, **never** wait until the last minute to submit an assignment. Working with computers means that the internet may be down when we least expect it, making us miss an important deadline. To prevent this, we must work ahead of deadlines.

HOW TO ACCESS THE ONLINE HOMEWORK QUIZZES

The textbook is packaged with the ***Student Access Kit to Mastering Astronomy.***
If you purchased a used textbook, you may choose to purchase the Access Kit online at:
www.masteringastronomy.com

Day One: Register for the Class

Go to the Mastering Astronomy website: **www.masteringastronomy.com**

Click on **Support & Training** and download the PDF file **Student User Guide**. You may want to watch also the short videos on *How do I register?* and *Is my computer setup for Mastering?*

- Back to the Home page, click on **Register** and then **New Students**
- Do you have the Student Access Code from the Student Access Kit inside your textbook?

  Click **Yes or No** (in which case you may purchase it online)
- Do you have a Pearson Education Account? Select **No**, then
  - create your ***Login Name*** (last name, first name please) and ***Password***
  - enter the ***Mastering Astronomy Access Code*** (found inside the Student Access Kit)
  - enter your personal information
  - choose the *school location* (Zip: 48309)
  - click on '**Next**': a 'Confirmation & Summary' page will appear.
- Click on '**Log In Now**' – Now you can Login as a Returning User.
  - enter the ***Course ID***: **P105W14CASTOLDI** (Note that 105 & 14 are numbers!)

To access the Homework:

Go to the Mastering Astronomy website: **www.masteringastronomy.com**

Step 1: Login
Step 2: Click on **Assignment List**
Step 3: Choose the homework chapter, e.g. 'Chapter 1'
Step 4: Answer all the questions
Step 5: Submit for grading

Please Note:

If you do not enter the Class ID, your grade will not appear on my Gradebook!

MasteringAstronomy®

Student Registration

In this course you will be using MasteringAstronomy, an online tutorial and homework program.

Note: If you have joined a MasteringAstronomy course before with the same textbook, save time by following the guide for joining another course found at www.MasteringAstronomy.com *>Tours & Training> Getting Started> Students*

What You Need:

- ✓ **A valid email address**
- ✓ **A student access code**
  (Comes in the Student Access Code Card/Kit that may have been packaged with your new textbook or that may be available separately in your school's bookstore. Otherwise, you can purchase access online at www.masteringastronomy.com .) **DO NOT THROW AWAY the card that came in your textbook!**
- ✓ **Your School Zip Code:**_____
- ✓ **A Course ID:** _____ (Provided by your instructor.)

1. Register

- Go to www.masteringastronomy.com and click **Students** under **Register**.
- To register using the student access code inside the MasteringAstronomy Student Access Code Card/Kit, select **Yes, I have an access code**. Click **Continue**

  –OR– *Purchase access online*: Select **No, I need to purchase access online now**. Select your textbook, whether you want access to the eText, and click **Continue**. Follow the on-screen instructions to purchase access using a credit card. (The purchase path includes registration, but the process is a bit different from the steps printed here.) **Be sure to choose the RIGHT version of your textbook!**

- **License Agreement and Privacy Policy:** Click **I Accept** to indicate that you have read and agree to the license agreement and privacy policy.
- Select the appropriate option under "Do you have a Pearson Education account?" (**Yes**, **No**, or **Not Sure**)
- Continue to give the requested information until you complete the process. The **Confirmation & Summary** page confirms your registration. This information will also be emailed to you for your records. You can either click **Sign In Now** or return to www.masteringastronomy.com later.

2. Sign In

- Go to www.masteringastronomy.com .
- Enter your Login Name and Password that you specified during registration and click **Sign In**.

3. Join Your Instructor's Online Course and/or Open Self-Study Resources

When you first Sign In, you'll be asked to do one or more of the following:

- **Join a Course** by entering the **MasteringAstronomy Course ID** provided by your instructor. If you don't have a Course ID now, you can return to join the MasteringAstronomy course later. When you join a course, you may also be asked for a Student ID (if your professor requested this, follow the on-screen instructions).
- If you do not have a Course ID, you can **Explore the Study Area** or **Launch Your eText**, if these resources are available for your textbook.

For a video demo from your Smart Phone, scan here:	For additional support go to:
	http://www.masteringastronomy.com/site/support/faq-students.html • System Requirements/Browser suggestions • Answers to Frequently Asked Questions • Registration Tips & Tricks video • Additional contact information for Customer Support, including Live Chat

HOW TO ACCESS THE SELF-GUIDED TUTORIALS

- Login under **www.masteringastromony.com**
- Click on ***'Study Area'*** at the top-right
- Click on ***'Self-Guided Tutorials'*** on the left hand side.
- A list of Tutorial activities will be prompted.
- Click on the Tutorial assigned for the week.

Assigned Tutorials

– Scale of the Universe
– Orbits and Kepler's Laws
– Light and Spectroscopy
– Doppler Shift
– Telescopes
– The Sun
– Measuring Cosmic Distances
– Hertzsprung-Russell Diagram
– Stellar Evolution
– Black Holes
– Detecting Dark Matter in Spiral Galaxies
– Hubble's Law

SKY SIMULATION ACTIVITIES

The Sky-Simulation Activities require the **VOYAGER: SKY-GAZER (version 5.0) Access Code**

1) Read the minimum system requirements and installation guidelines on the Voyager: Sky-Gazer cover. Install the program on your computer.
2) The Activities will be provided on Moodle in Microsoft Word format.
    a. I suggest that you print the Activity and write your answers on it using a pencil.
    b. Once you are convinced of your answers, enter these on the Report file and send it to my Teaching Assistant via e-mail by the due date.

Assigned SkyGazer Activities

– Introducing Sky-Gazer
– Stars and the H-R Diagram
– Galaxies – the Milky Way
– The Universe – Hubble's Law

PHY 105 – WEEKLY SCHEDULE – WINTER 2014

Week 1 – January 6 – 12

Chapter 1: Our Place in the Universe

Week 2 – January 13 – 19

Chapter 3, Section 3 only
Chapter 4: Motion, Energy and Gravity

Due January 15:

- Ch 1 Online Quizzes (individually)
- Ch 1 Chapter Questions (group)
- Tutorial: Scale of the Universe (group)

Week 3 – January 20 – 26

Chapter 5: Light

Due January 22:

- Ch 4 Online Quizzes
- Ch 4 Chapter Questions (group)
- Tutorial: Orbits and Kepler's Laws (group)

Week 4 – January 27 – February 2

Chapter 6: Telescopes

Due January 29:

- Ch 5 Online Quizzes
- Ch 5 Chapter Questions (group)
- Tutorial: Light and Spectroscopy (group)
- Sky-Gazer Activity: Introducing SkyGazer (individually)

Week 5 – February 3 – 9

Chapter 14: Our Star

Due February 5:

- Ch 6 Online Quizzes
- Ch 6 Chapter Questions (group)
- Tutorial: Doppler Shift (group)

Online Exam # 1: Saturday, February 8 – Chapters 1, 3 sect.3, 4, 5, 6

The exam is one hour long and is available all day on MasteringAstronomy.com

Week 6 – February 10 – 16

Chapter 15: Surveying the Stars

Due February 12:

- Ch 14 Online Quizzes
- Ch 14 Chapter Questions (group)
- Tutorial: Telescopes (group)

Week 7 – February 17 – 23

Chapter 16: Star Birth

Due February 19:

- Ch 15 Online Quizzes
- Ch 15 Chapter Questions (group)
- Tutorial: The Sun (group)

Week 8 – March 3 – 9

Chapter 17: Star Stuff

Due March 5:

- Ch 16 Online Quizzes
- Ch 16 Chapter Questions (group)
- Tutorial: Measuring Cosmic Distances (group)
- Sky-Gazer Activity: Stars & the H-R Diagram (individually)

Week 9 – March 10 – 16

Chapter 18: Stellar Graveyard

Due March 12:

- Ch 17 Online Quizzes
- Ch 17 Chapter Questions (group)
- Tutorial: The Hertzsprung-Russell Diagram (group)

Week 10 – March 17 – 23

Chapter 19: Our Galaxy

Due March 19:

- Ch 18 Online Quizzes
- Ch 18 Chapter Questions (group)
- Tutorial: Stellar Evolution (group)
- Sky-Gazer Activity: Galaxies, the Milky Way (individually)

Online Exam # 2: Saturday, March 22 – Chapters 14, 15, 16, 17, 18

The exam is one hour long and is available all day on MasteringAstronomy.com

Week 11 – March 24 – 30

Chapter 20: Galaxies

Due March 26:

- Ch 19 Online Quizzes
- Ch 19 Chapter Questions (group)
- Tutorial: Black Holes (group)

Week 12 – March 31 – April 6

Chapter 21: Galaxy Evolution

Due April 2:

- Ch 20 Online Quizzes
- Ch 20 Chapter Questions (group)
- Tutorial: Detecting Dark Matter in Spiral Galaxies (group)
- SkyGazer Activity: the Universe, Hubble's Law (individ.)

Week 13 – April 7 – 13

Chapter S3: Spacetime and Gravity
Chapter 22: Dark Matter

Due April 9:

- Ch 21 Online Quizzes
- Ch 21 Chapter Questions (group)
- Tutorial: Hubble's Law (group)

Week 14 – April 14 – 20

Chapter 23: Cosmology

Due April 16:

- Ch 22, 23 Online Quizzes

Online Exam #3 – Monday, April 21 – Exam # 3 – Chapters 19, 20, 21, 22, 23, S3

The exam is one hour long and is available all day on MasteringAstronomy.com