Physics 1050 - Astronomy: Stars and Galaxies
4 Credit Hours
Winter 2019
THIS IS AN ONLINE COURSE

Instructor: Kapila Clara Castoldi
Office: 162 Hannah Hall
Contact: castoldi@oakland.edu
Phone: 734-994-7114 (home)

Virtual Office Hours: upon request - via video conferencing or by phone

Course Management System: Moodle

Course (Catalog) Description: Nature and Evolution of stars, the Milky Way and other galaxies, 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. 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. At the same time, cosmologists are seeking for a theory that describes birth, evolution and future of the Universe.

The main goal of this course is to foster 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 motion of celestial objects, the thermonuclear 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.

- **Laboratories** – these include both qualitative and quantitative analysis of data and serve to reinforce the understanding of fundamental concepts and to gain an appreciation for the way that modern experiments are made by astronomers.

- **Online Quizzes** – on the Mastering Astronomy website, these include reading quizzes and short tutorials.

**Textbooks:** Bennett: The Cosmic Perspective: Stars, Galaxies and Cosmology – Edition 8/e packaged with Student Access Kit to Mastering Astronomy


You may choose to purchase the printed book with Mastering:

- at the Campus bookstore – for $134
- online directly through Pearson’s website – for $131

**www.mypearsonstore.com** (Search the book by ISBN)

If you wish to purchase just the e-book with Mastering:

- go to the website listed below, click on *Register Now*,
  and choose to purchase the 6-months access – for $60

**www.masteringastronomy.com**

**Notice:** it is recommended that you purchase the complete package new. *Used books have a used Access Codes to Mastering Astronomy, which cannot be reused. You would have to purchase a new Access Code 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 or find one or two other partners and work with them at least once a week for a couple of hours on this review material.

Lecture Notes: Lecture notes will be available on Moddle. These can be used as a 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 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 12.5% 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 MasteringAstronomy.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 12.5% of the final grade.**

Laboratories: These activities are intended to develop critical thinking, learn how to analyze data, and test models. They include both qualitative and quantitative analysis of data and serve to reinforce the understanding of fundamental concepts in astronomy.

- **Lab 1:** The H-R Diagram
- **Lab 2:** Pulsars
- **Lab 3:** Classification of Galaxies

The write-up of these labs is available online on Moodle. The reports must be submitted by e-mail to my Teaching Assistant for grading. Laboratories are intended for individual work – this is not group work.

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

*Please notice: this General Education course requires laboratory experiences.*
*You will not be able to pass the course unless you turn-in all three labs.*

**The Laboratories are worth 20% of the final grade.**

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

*Please notice: you will not be able to pass the course unless you take all three exams*

**The Online Exams are worth 15% each, for a total of 45% of the final grade.**
Gradebook: All grades will be posted on Moodle’s Gradebook. The Gradebook will be updated regularly as new grades become available.

Course grade: The course grade will be calculated on the basis of the following percentages:

* Online Quizzes: 10.0%
* Chapter Questions 12.5%
* Tutorials: 12.5%
* Laboratories: 20.0%
* Online Exams: 45.0%

Grading scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>96-100</td>
</tr>
<tr>
<td>A-</td>
<td>90-95</td>
</tr>
<tr>
<td>B+</td>
<td>85-89</td>
</tr>
<tr>
<td>B</td>
<td>80-84</td>
</tr>
<tr>
<td>B-</td>
<td>75-79</td>
</tr>
<tr>
<td>C+</td>
<td>70-74</td>
</tr>
<tr>
<td>C</td>
<td>65-69</td>
</tr>
<tr>
<td>C-</td>
<td>60-64</td>
</tr>
<tr>
<td>D+</td>
<td>55-59</td>
</tr>
<tr>
<td>D</td>
<td>50-54</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 50</td>
</tr>
</tbody>
</table>
Things to do during the first week:

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 which will help you understand 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.

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.
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.

Reasonable Accommodations
Accessibility and Accommodations: It is the University’s goal that learning experiences be as accessible as possible. Students with disabilities who have questions about course accessibility are encouraged to contact the instructor immediately. The Office of Disability and Support Services (DSS) is available to help. The DSS office is located in room 103A North Foundation Hall.
For more information, call 248-370-3266 or visit https://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 F, 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
The University excused absence policy 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: https://www.oakland.edu/provost/policies-and-procedures/

Bereavement Policy
In the event of the death of certain members within families or among loved ones, the University grants necessary bereavement absences upon student request.
For the official bereavement policy, see: https://www.oakland.edu/provost/policies-and-procedures/

Student Preferred Name/Pronoun Policy
The University recognizes that as a community many of its members use names other than their legal names to identify themselves. As long as the use of this different name is not for the purposes of misrepresentation or a legal name is required by University business, policy or legal need, the University acknowledges that a "preferred name" will be used wherever possible. The University reserves the right to not accept a preferred name if it is deemed inappropriate, including a preferred name that is vulgar, offensive, fanciful, or creates confusion with another person.
Communication:

**Instructor → Student:**

Communications from the instructor will happen via the Announcements forum in Moodle. These are forwarded by Moodle to your Oakland e-mail account.

- **You are expected to be familiar with Moodle.** To check how to login to Moodle, the Technical Requirements and how to obtain Support, please go to:  
  
  https://oakland.edu/online/resources/online-student-orientation/

- You are expected to **login to Moodle at least twice a week and check your email daily.**
- A Weekly format will be used in Moodle. Guidelines for the homework and all other activities will be posted week by week. 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 1050 – 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.**

**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 *Online Student Orientation*:

https://oakland.edu/online/resources/online-student-orientation/

If this doesn’t help, contact the e-LIS at **248-370-4566**
You may also submit a Help Request Form to e-LIS:

https://www2.oakland.edu/secure/esp/

**Online Quizzes:**

Go to the [www.masteringastronomy.com](http://www.masteringastronomy.com) website
Under ‘Student’, click on the ‘Support’ tab.
  - You may read answers to Top Questions,
  - Read the Student User Guide, or
  - Ask questions
HOW TO ACCESS THE ONLINE HOMEWORK QUIZZES

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

www.MasteringAstronomy.com

Day One: Register for the Class

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

Under the Student tab, click on Support and download the Student User Guide.

- Back to the Home page, click on Register Now
- Watch the short videos on How do I register? and Is my computer setup for Mastering?
- 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: P1050W19CASTOLDI (Note that 1050 & 19 are numbers!)

Please Notice: if you have a Pearson account already, check the information posted on the following pages

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!
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](http://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](http://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](http://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](http://www.masteringastronomy.com) later.

### 2. Sign In
- Go to [www.masteringastronomy.com](http://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](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 Join Another MasteringAstronomy Course

To join another MasteringAstronomy® course, see which column below applies to you. You can be in up to four MasteringAstronomy courses, whether at the same time or one after another.

<table>
<thead>
<tr>
<th>If you CAN STILL LOG IN to a MasteringAstronomy course</th>
<th>If you CANNOT LOG IN to a MasteringAstronomy course anymore</th>
</tr>
</thead>
<tbody>
<tr>
<td>-AND-</td>
<td>-OR-</td>
</tr>
<tr>
<td>Your next MasteringAstronomy course uses the same textbook (including its edition) or the same resource, such as Virtual Lab, as the original course:</td>
<td>If your next MasteringAstronomy course uses a different textbook or different resource, such as Virtual Lab, than your previous course:</td>
</tr>
</tbody>
</table>

Follow the instructions below.

You don’t need to register again (i.e., redeem an access code or buy access online).

Note: Your instructor controls the end date for each MasteringAstronomy course. You can no longer log in to a course after its end date.

Follow the instructions in the student guide for getting started (available from www.MasteringAstronomy.com > Tours & Training > Getting Started). You will need to redeem an access code or buy access online.

Tip: To help manage your Pearson resources, use the same Pearson user account (as identified by your Login Name and Password) for all of your Pearson products.

Log in to a MasteringAstronomy course
2. Enter your Login Name and Password and click Log In.

Join another MasteringAstronomy course and open available self-study resources
1. Click My Courses in the upper left.
2. Choose Join Another Course.
3. Enter the Course ID and click Continue.
   - Don’t have the Course ID yet? Get this information from your instructor.
   - If the Course ID you entered applies to a different book or another resource for which you don’t have access yet: You will be asked to either redeem an access code or buy access online. Follow the on-screen instructions.
4. If asked, enter your Student ID according to the instructions provided and click Continue.
   - If you want to consult with your instructor first: You can add your Student ID later by clicking your name link in the upper right.

You should see the Course Home page of the additional course. From now on, logging in will take you to the Course Home page of the MasteringAstronomy course you last worked in.
- To switch your view among MasteringAstronomy courses: My Courses > Switch to a Different Course menu.
- To check out self-study resources: Click eText and/or Study Area, as available.

Support
Go to the Support area of www.MasteringAstronomy.com, where you will find:
- System Requirements
- Answers to Frequently Asked Questions
- Registration Tips & Tricks video
  Contact information for Support, including Live Chat
HOW TO ACCESS THE SELF-GUIDED TUTORIALS

- Login under www.masteringastromony.com
- Click on ‘Study Area’ on the left
- Click on ‘Self-Guided Tutorials’ on the left
- A list of Tutorial activities will be prompted
- Click on the Tutorial assigned for the week
  o go through the Tutorial, and
  o answer the questions posted on Moodle

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
PHY 1050 – WEEKLY SCHEDULE – WINTER 2019

Week 1 – January 3 – 9

Chapter 1: Our Place in the Universe

Due January 9:
- Syllabus Quiz
- Are you ready for Online Learning Quiz
- Getting to Know Each Other Forum

Week 2 – January 10 – 16

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

Due January 11:
- Ch 1 Online Quizzes (individually)

Week 3 – January 17 – 23

Chapter 5: Light

Due January 18:
- Ch 4 Online Quizzes (individually)
- Ch 4 Chapter Questions (group)
- Tutorial 1: Scale of the Universe (group)

Week 4 – January 24 – 30

Chapter 6: Telescopes

Due January 25:
- Ch 5 Online Quizzes
- Ch 5 Chapter Questions (group)
- Tutorial 2: Orbits and Kepler’s Laws (group)

Week 5 – January 31 – February 6

Chapter 14: Our Star

Due February 1:
- Ch 6 Online Quizzes
- Ch 6 Chapter Questions (group)
- Tutorial 3: Light and Spectroscopy (group)

Online Exam # 1: February 2 – Chapters 1, 3 sect.3, 4, 5, 6
The exam is available all day on Saturday through noon on Sunday on MasteringAstronomy.com
Once you start, you have one hour to complete it.
Week 6 – February 7 – 13

Chapter 15: Surveying the Stars

Due February 8:
- Ch 14 Online Quizzes
- Ch 14 Chapter Questions (group)
- Tutorial 4: Doppler Shift (group)

Week 7 – February 14 – 27 (includes recess)

Chapter 16: Star Birth

Due February 15:
- Ch 15 Online Quizzes
- Ch 15 Chapter Questions (group)
- Tutorial 5: Telescopes (group)
- Lab 1: The H-R Diagram (individually)

Week 8 – February 28 – March 6

Chapter 17: Star Stuff

Due March 1:
- Ch 16 Online Quizzes
- Ch 16 Chapter Questions (group)
- Tutorial 6: The Sun (group)
- Peer Evaluation Rubric

Week 9 – March 7 – 13

Chapter 18: Stellar Graveyard

Due March 8:
- Ch 17 Online Quizzes
- Ch 17 Chapter Questions (group)
- Tutorial 7: Measuring Cosmic Distances (group)
- Lab 2: Pulsars (individually)

Week 10 – March 14 – 20

Chapter 19: Our Galaxy

Due March 15:
- Ch 18 Online Quizzes
- Ch 18 Chapter Questions (group)
- Tutorial 8: The Hertzsprung-Russell Diagram (group)

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

The exam is available all day on Saturday through noon on Sunday on MasteringAstronomy.com
Once you start, you have one hour to complete it.
Week 11 – March 21 – 27

Chapter 20: Galaxies

Due March 22:
- Ch 19 Online Quizzes
- Ch 19 Chapter Questions (group)
- Tutorial 9: Stellar Evolution (group)

Week 12 – March 28 – April 3

Chapter 21: Galaxy Evolution

Due March 29:
- Ch 20 Online Quizzes
- Ch 20 Chapter Questions (group)
- Tutorial 10: Black Holes (group)
- Lab 3: Classification of Galaxies (individually)

Week 13 – April 4 – 10

Chapter S3: Spacetime and Gravity
Chapter 22: Birth of the Universe

Due April 5:
- Ch 21 Online Quizzes
- Ch 21 Chapter Questions (group)
- Tutorial 11: Detecting Dark Matter in Spiral Galaxies (group)

Week 14 – April 11 – 17

Chapter 23: Dark Matter

Due April 12:
- Ch 22, 23 Online Quizzes
- Tutorial 12: Hubble’s Law (group)

Online Exam #3 – April 20 – Exam #3 – Chapters 19, 20, 21, 22, 23, S3
The exam is available all day on Saturday through noon on Sunday on MasteringAstronomy.com
Once you start, you have one hour to complete it.