

**Physics 1050 - Astronomy: Stars and Galaxies**

**4 Credit Hours**

**Winter 2021**

**FULLY ONLINE COURSE - Asynchronous**

**Instructor:** Kapila Clara Castoldi

**Office:** 162 Hannah Hall

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**Phone (home):** 734-994-7114 (8 am – 8 pm)

**Virtual Office Hours:** upon request - by phone or Zoom 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.

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 and Galaxies – Edition 9/e  
packaged with Student Access to Modified Mastering Astronomy  
Pearson Publishing – ISBN: 9780135932490 [Requested]

Purchasing options:

- At the **campus bookstore**:
  - o Printed textbook + Access to Modified Mastering Astronomy  
ISBN: 9780135932490 \$143
  - o Access Card to Modified Mastering Astronomy + e-Text  
ISBN: 9780135208113 \$113
- At **mypearsonstore.com** (search by ISBN):
  - o Instant Access to Modified Mastering Astronomy + e-Text  
ISBN: 9780135208090 \$95

**Notice:** *it is recommended that you purchase the complete package new. Used books have a used Access Codes to Modified Mastering, which cannot be reused. You would have to purchase a new Access Code online.*

**Features:** The textbook includes two important Student Supplements:  
The *Modified Mastering Astronomy* website features a variety of interactive tutorials, interactive figures and photos, mini documentaries, e-textbook, etc.

**<https://www.pearson.com/mastering>**

The *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 the *Modified Mastering Astronomy* website.

The *Study Area* tab is at the left of the screen. Once in there, choose *Study by chapter*.

As you scroll down the page, you will see the e-text, short tutorial videos and *Reading and Concept Quizzes*. These serve as an excellent chapter review. These quizzes are not graded, and you may take them repeatedly – for example after you study the 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 meet with your assigned group once a week for a couple of hours and work with them on this review material.

**Lecture Notes:** Lecture notes will be available on Moodle. 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 **Modified Mastering Astronomy** website:

**<https://www.pearson.com/mastering>**

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 under the *Study Area* of the **Modified Mastering Astronomy** website (<https://www.pearson.com/mastering>). 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 **Modified Mastering Astronomy** website:

**<https://www.pearson.com/mastering>**

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:**

<b>A</b>	<b>96-100</b>
<b>A-</b>	<b>90-95</b>
<b>B+</b>	<b>85-89</b>
<b>B</b>	<b>80-84</b>
<b>B-</b>	<b>75-79</b>
<b>C+</b>	<b>70-74</b>
<b>C</b>	<b>65-69</b>
<b>C-</b>	<b>60-64</b>
<b>D+</b>	<b>55-59</b>
<b>D</b>	<b>50-54</b>
<b>F</b>	<b>&lt; 50</b>

## 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**

Course rosters are typically provided to the instructor with the student's legal names. If you do not identify with the name that is listed with the Registrar's office, please notify me. I will gladly honor your request to address you by an alternate name or gender pronoun. For more information on indicating a preferred first name on university records, please visit:

<https://www.oakland.edu/uts/common-good-core-resources/name-services/>

## Communication:

### Instructor → Student:

Communications from the instructor will happen via the **News Forum** in **Moodle** (forwarded by Moodle to your Oakland e-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:

**<https://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 and all other activities will be posted week by week.

You will have to scroll down the Moodle page to check each week of the course.

### Student → Instructor:

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

**[castoldi@oakland.edu](mailto: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:

- o '*Student Chat Room*' Forum – setup on Moodle for students to initiate a chat
- o '*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 video conferencing.

Upon request, we can setup a **phone call** or **Zoom** 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](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 **<https://www.pearsonmylabandmastering.com/northamerica/>** website

Under 'Student', click on 'Support', you may

- Get help with Registration
- Read answers to Top Questions,
- Access the Student User Guide, or
- Get Technical Support

## 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 Code to Modified Mastering online during the registration process.

### *Day One: Register for the Class*

Go to the Modified Mastering Astronomy website:

**<https://www.pearson.com/mastering/>**

Prior to registering, you may want to read information on how to get started and the Student User Guide. Click on **Support** under the green **Students** area, or go directly to:

**<https://www.pearson.com/mastering/students/support/>**

Under **Register** select **Student** and follow the instructions

**The Course ID is:**                **castoldi36078**

**The Course Name is:**        **Phy 1050 Online - Winter 2021 - Castoldi**

*Notice: there is a 14-day grace period in Modified Mastering during which you may do the homework even if you do not have the Access Code yet.*

### *Accessing the Homework:*

Once you are registered, select **Go to My Courses**.

On the **My Courses** page, select the course **Phy 1050 Online - Winter 2021 - Castoldi**

On the main page a list of available *Assignments* will appear.

Click on the assignment. It is a mix of multiple-choice questions and a few short tutorials.

(For more details, read the file **Student Registration Instructions** on Moodle)

## HOW TO ACCESS THE SELF-GUIDED TUTORIALS

Login under <https://www.pearson.com/mastering/>

- Click on the course **Phy 1050 Online - Winter 2021 - Castoldi**
- Click on '*Study Area*' at the left, then '*Launch Study Area*'
- Click on '*Self-Guided Tutorials*'
- A list of Tutorial activities will be prompted.
- Click on the Tutorial assigned for the given week.
- While watching the tutorial, answer the questions about the tutorial posted on Moodle

### **Assigned Tutorials**

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- 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 2021

### Week 1 – January 6 – 12

Chapter 1: Our Place in the Universe

Due January 10:

- Syllabus Quiz
- Are you ready for Online Learning Quiz
- Getting to Know Each Other Forum

### Week 2 – January 13 – 19

Chapter 3, Section 3 only

Chapter 4: Motion, Energy and Gravity

Due January 17:

- Ch 1 Online Quizzes (individually)

### Week 3 – January 20 – 26

Chapter 5: Light

Due January 24:

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

### Week 4 – January 27 – February 2

Chapter 6: Telescopes

Due January 31:

- Ch 5 Online Quizzes
- Ch 5 Chapter Questions (group)
- Tutorial 2: Orbits and Kepler's Laws (group)

### Week 5 – February 3 – 9

Chapter 14: Our Star

Due February 7:

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

**Online Exam # 1: Sunday, February 7 – Chapters 1, 3 sect.3, 4, 5, 6**

**The exam is available 7:00 am – 10:00 pm on the Modified Mastering Astronomy website  
About 60 questions. Once you start, you have 70 minutes to complete it.**

## **Week 6 – February 10 – 16**

### Chapter 15: Surveying the Stars

Due February 14:

- [Ch 14 Online Quizzes](#)
- [Ch 14 Chapter Questions \(group\)](#)
- [Tutorial 4: Doppler Shift \(group\)](#)

## **Week 7 – February 17 – March 2 (includes recess)**

### Chapter 16: Star Birth

Due February 21:

- [Ch 15 Online Quizzes](#)
- [Ch 15 Chapter Questions \(group\)](#)
- [Tutorial 5: Telescopes \(group\)](#)
- [Lab 1: The H-R Diagram \(individually\)](#)

## **Week 8 – March 3 – 9**

### Chapter 17: Star Stuff

Due March 7:

- [Ch 16 Online Quizzes](#)
- [Ch 16 Chapter Questions \(group\)](#)
- [Tutorial 6: The Sun \(group\)](#)
- [Peer Evaluation Rubric](#)

## **Week 9 – March 10 – 16**

### Chapter 18: Stellar Graveyard

Due March 14:

- [Ch 17 Online Quizzes](#)
- [Ch 17 Chapter Questions \(group\)](#)
- [Tutorial 7: Measuring Cosmic Distances \(group\)](#)
- [Lab 2: Pulsars \(individually\)](#)

## **Week 10 – March 17 – 23**

### Chapter 19: Our Galaxy

Due March 21:

- [Ch 18 Online Quizzes](#)
- [Ch 18 Chapter Questions \(group\)](#)
- [Tutorial 8: The Hertzsprung-Russell Diagram \(group\)](#)

**Online Exam # 2: Sunday, March 21 – Chapters 14, 15, 16, 17, 18**

**The exam is available 7:00 am – 10:00 pm on the Modified Mastering Astronomy website  
About 60 questions. Once you start, you have 70 minutes to complete it.**

## **Week 11 – March 24 – 30**

Chapter 20: Galaxies

Due March 28:

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

## **Week 12 – March 31 – April 6**

Chapter 21: Galaxy Evolution

Due April 4:

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

## **Week 13 – April 7 – 13**

Chapter S3: Spacetime and Gravity

Chapter 22: Birth of the Universe

Due April 11:

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

## **Week 14 – April 14 – 20**

Chapter 23: Dark Matter

Due April 18:

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

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

**The exam is available 7:00 am – 10:00 pm on the Modified Mastering Astronomy website**

**About 60 questions. Once you start, you have 70 minutes to complete it.**