



UNIVERSITY of HAWAII*

WINDWARD
COMMUNITY COLLEGE

ASTR 110 SURVEY OF ASTRONOMY

CRN = 62078 3 Credits

Term Dates - 8 Jan to 14 May 2024

Asynchronous Online Course – Check in Daily

INSTRUCTOR:	Sean P. Moroney, Ph.D.	
CLASSROOM:	Laulima ClassRoom	Unscheduled
OFFICE HOURS:	WCC CAMPUS - Imiloa 112B	Monday 9:00 – 10:00 AM Wednesday 12:00 PM – 1:00 PM
	ZoomRoom (See Laulima Overview)	Monday. 6:30 – 7:30 PM or by appointment
TELEPHONE:	On-Campus - (808) 236-9117	
EMAIL:	moroney@hawaii.edu	
EFFECTIVE DATE:	Spring 2024	

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai'i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide Ko'olau region of O'ahu and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring Students to excellence.

CATALOG DESCRIPTION

Introduction to the astronomical universe for non-science majors.

Activities Required at Scheduled Times Other Than Class Times

No additional activities

PREREQUISITES

There are no prerequisites for this course.

ONLINE ACCESS

This course may be found at laulima.hawaii.edu.

ANNOUNCEMENTS

The Announcements Section in Laulima is a critically important Section for the transmission of information about the course.
The Announcements should be checked frequently.

STUDENT LEARNING OUTCOMES

The Student Learning Outcomes for the course are:

1. Outline the development of astronomy from ancient times to present and explain the role of the scientific method in this historical context.
2. Describe and explain the apparent motions of the celestial bodies, especially as related to naked-eye observations.
3. Identify the appropriate instruments used by astronomers to understand the universe.
4. Outline the origins of our solar system and appraise the leading cosmological theories of the origin of the universe.
5. Describe the physical and chemical properties of the objects in our solar system and apply the concept of comparative planetology.
6. Describe the physical and chemical nature of stars, and especially our sun, and apply the astronomical techniques used to measure stellar properties.
7. Outline the evolutionary stages in a star's life and compare and contrast the structure of our Milky Way and other galaxies.
8. Apply astronomical concepts to the search for extraterrestrial life.

LEARNING RESOURCES

Textbook:

Astronomy by Fraknoi, Morrison, and Wolf. Openstax/Rice University (2017).

Here is a direct link to the textbook: <https://openstax.org/details/books/astronomy>

You can access the free online, phone app, and PDF formats of Openstax books by following these steps:

1. Go to <https://openstax.org/subjects>
2. Click on the cover of the book you would like to view. This will take you to its Details page
3. Under the **Get the book** heading on the left, select the format you would like to use. It's that easy!

In addition to our free formats, we also provide low-cost print copies for all our books.

Individual orders can be placed through [Amazon](#), and bookstores can order through our [partnered suppliers](#).

Course Laulima site:

www.laulima.hawaii.edu: It is here that the course comes alive. Explore this site and ask questions about its features.

ATTENDANCE & PARTICIPATION

Checking in regularly and interacting with the Instructor and the class is expected. A number of our Assignments require some level of interaction with the Instructor and with other class members.

It will be important to observe the **Due Dates** for the course. A steady progress forward will get us all successfully to the goal.

COMMUNICATION

Students are expected to login regularly, to participate in class discussions, and to stay current with the course material. They are also expected to behave politely, respectfully, and professionally while communicating with their peers and with the Instructor in online discussions, email, video conferencing, and in other forms of interactions. The UH Internet Etiquette (i.e., “Netiquette”) is available for review in Laulima / Resources / Course Docs.

OTHER CENTRALIZED COURSE INFORMATION

Information on many other aspects of this course may be found in the various documents in Laulima’s Left Menu / Resources / Course Docs.

All of this information is considered as an extension of this Syllabus.

COURSE MODULES

The course is structurally divided into 5 Modules, each of which has a 3-week window within which various Course Tasks are to be carried out and completed. The Course Calendar below identifies those time segments.

Module 1 - 8 Jan to 28 Jan:

Here we cover the basics. These include the overall view of the universe as it stretches through space and time, the development through time of the advances in the understanding of the things in the sky, the local phenomena we see from our perspective on a moving platform (Earth) within the solar system, the understanding of the types of radiation that inform us about the cosmos, and the technology that lets us actually detect interesting phenomena in deep space. (SLOs 1, 2, &3)

MODULE 1 LEARNING OBJECTIVES:

Upon completion of this Module, the Student will be able to:

- 1.1 - Discuss the spatial dimensions and the age of the universe.
- 1.2 - Identify the motions of the Earth and of the Sun, the stars, and all the galaxies.
- 1.3- Describe the development of Astronomy from ancient days through to the present.
- 1.4 - Explain the ordinary celestial and terrestrial phenomena of day and night, the seasons, and the motions of the Moon and the planets, both as the ancients saw them and as we see them today.
- 1.5 - Discuss the various components of the electromagnetic spectrum and identify how these radiations relate to physical phenomena in deep space.
- 1.6 - Compare and contrast the types of modern telescopes and how they work together to give us a deeper understanding of celestial phenomena.

**Module 2 - 29 Jan to 8 Feb:**

The origin of the solar system is discussed. The various planetary and satellite bodies of the Solar System are then reviewed in detail. The current state of our knowledge of the terrestrial planets, the jovian planets, and their moons is examined. (SLOs 3, 4, & 5)

MODULE 2 LEARNING OBJECTIVES:

Upon completion of this Module, the Student will be able to:

- 2.1 - Describe how the Solar System formed according to the Nebular Theory.
- 2.2 - Describe Earth as a planet, explaining its various properties.
- 2.3 - Describe the other worlds of the inner Solar System - Mercury, Venus, Mars, and the Moon.
- 2.4 - Explain the differences of the jovian planets when compared with the terrestrial worlds.
- 2.5 - Describe the rings of the jovian planets, the differences among their many moons, and the orbiting body known as Pluto.

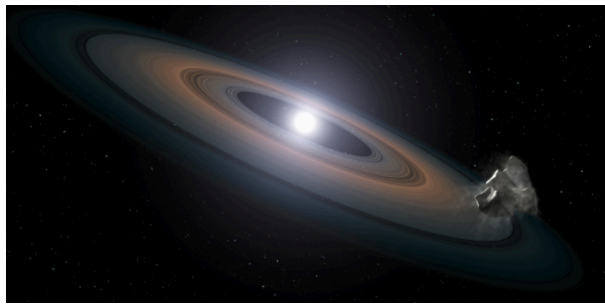
**Module 3 - 19 Feb to 10 Mar:**

The comets, asteroids, and meteorites in our Solar System are examined. The recent discoveries of other solar systems and of the varieties of planets orbiting distant stars is discussed. Then the nearest star, our Sun, and the other stars are compared and contrasted. The properties of stars of all types is reviewed. The H-R Diagram is introduced both as a tool for cataloging star types and as a way of displaying their evolutionary development. (SLOs 4, 5, & 6)

MODULE 3 LEARNING OBJECTIVES:

Upon completion of this Module, the Student will be able to:

- 3.1 - Discuss the differences between asteroids and comets and how these compare with meteorites.
- 3.2 - Integrate what has been learned so far into the current theory of how the Solar System formed.
- 3.3 - Describe the Sun, its cyclical activity, and its internal structure and composition.
- 3.4 - Explain the process of energy generation in the Sun by nuclear fusion.
- 3.5 - Explain how a star's absolute luminosity and temperature are measured and how its size and motion may be determined..
- 3.6 - Demonstrate how the H-R Diagram classifies the stellar population.



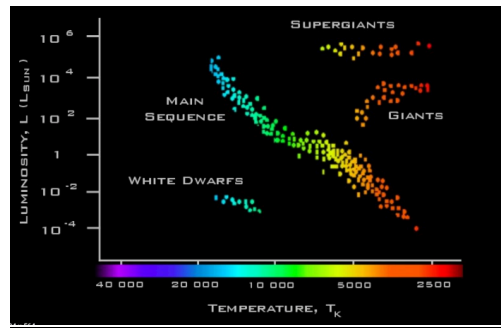
Module 4 - 18 Mar to 7 Apr

The measurement of the stellar distances and the contents of the space between the stars is investigated. The birth and aging of different types of stars is discussed. The end-stages of low- and high-mass stars (white dwarfs, neutron stars, and black holes) are then explored. (SLOs 6 & 7)

MODULE 4 LEARNING OBJECTIVES:

Upon completion of this Module, the Student will be able to:

- 4.1 - Describe the process of determining the distances to the stars.
- 4.2 - Describe the nature of the material that occupies the space between the stars.
- 4.3 - Describe the process of star formation.
- 4.4 - Explain the differences between our Solar System and the recently discovered Solar Systems around other stars.
- 4.5 - Describe the changes in a star's characteristics with time, as shown on the H-R Diagram.
- 4.6 - Explain the differences between the events leading to the death stages of low-mass and high-mass stars.
- 4.7 - Compare and contrast the formation and properties of neutron stars and black holes.



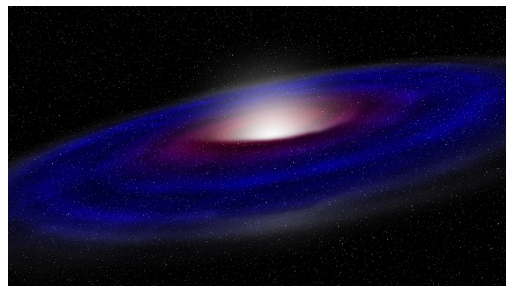
Module 5 - 8 Apr to 1 May:

Galaxies, both the Milky Way Galaxy in which we are located and other types that we have measured, are examined. Their distances, along with their implications, are reviewed. The cosmology of the Big Bang, along with the current topics of dark matter and dark energy, are examined. We conclude with a discussion of life in the cosmos. (SLOs 4, 7, & 8)

MODULE 5 LEARNING OBJECTIVES:

Upon completion of this Module, the Student will be able to:

- 5.1 - Describe the structure of the Milky Way Galaxy.
- 5.2 - Identify the different types of galaxies.
- 5.3 - Explain how the distances to galaxies are determined.
- 5.4 - Describe the nature of quasars.
- 5.5 - Describe the distribution of galaxies within the universe.
- 5.6 - Describe the evidence for the existence of dark matter.
- 5.7 - Describe the evidence in favor of the Big Bang Theory.
- 5.8 - Explain the overall process of the Big Bang and how it resulted in today's universe.
- 5.9 - Explain how dark energy is exerting its effects on the universe.
- 5.10 - Discuss the possibilities of life elsewhere in the universe.



COURSE TASKS

The Course Tasks (also called Assignments) described here rely considerably upon active involvement and participation by all course members.

The availability of each Course Task will be made known by an Announcement, which will also be emailed. Three days before a Course Task is Due, an Announcement to that effect will be posted and emailed.

Further details on all these course tasks will be by the Announced placement of labeled documents in the Course Docs section of the Left Menu.

In all Course Tasks, submissions will be inspected for errors or flaws in spelling, grammar, and sentence structure. If necessary, it will be useful to have someone with good language skills function as a proofreader for each Assignment.

- **First Week Introductions (FWI) 1% of the Course Grade (as Extra Credit):**
 - In the first nine days of the Course, each Student is to post, in the appropriate forum, complete answers to five introductory questions. Each Student should then review the postings of the other Students and should then reply, abiding by the Netiquette protocols posted on the Course website, to a minimum of two (2) of the fellow Students.
 - Out of 100 points, the initial posting, if complete, is worth 70 points. Each reply, to a maximum of 2, is worth 15 points. Additional replies are welcome, since this builds a camaraderie and facilitates teamwork.
 - By the Due Date; the postings should be all complete. **WCC has linked any absence of postings or responses here to the possibility of being disenrolled from the course.**
- **Projects (30% of the Course Grade):**
 - There will be two (2) Projects during the term.
 - The Project Reports will have Due Dates that are, in general, independent of the 5-Module Schedule. Please consult the Course Calendars at the end of the Syllabus.
 - Announcements about the availability of the Topics and their Due Dates will be posted as they become necessary.
 - Basic Project Instructions are available for both Project Topics and both Project Reports in their Text Headers in the Assignments Section of the Left Menu. A more complete set of Project Instructions, covering both Topics and Reports is available in Laulima's Left Menu / Resources / Course Docs.
 - The Topics selected for the Project Reports must be submitted for approval by their posted Due Dates. Please see the Topics Text Boxes and the Projects Course Docs for further guidance.
 - The Instructor may make recommendations on narrowing the scope of, modifying, or completely changing the selected Topic. This will be done in the interests of having the Project be both manageable and meaningful.
 - Each Topic selection is valued at 10 points of the 100 points for its Project. A Topic may be resubmitted continuously until the end of its Grace Period until it is approved.
 - Each Project Report is valued as 90 points of the 100 points for that Project.
 - The SLOs for each Module apply to these Assignments.

- **Cosmic News Articles (CN-A) (1% of the Course Grade):**
 - During each of the five (5) Modules, in Forums set up for this purpose, Students will present and discuss recent Cosmic News Articles, focused on the current events of all of our national space races and related to the current Topics of the Modules, from web-based internet sources.
 - Students are to explore the current Astronomical News Media for related topics of interest, looking for relevant News Articles with a **single common theme or subject matter**. They will read them carefully, making notes to help integrate their contents. Finally, they will compose and post thoughtful summaries in a Cosmic News Report. The Posting Area will be defined later.
 - The Articles chosen must be **related to the same topic**. Topics must have focuses that are neither too broad nor too narrow. A topic like “Mars” is too large and ill-defined; a topic like “The Polar Ice Caps of Mars” is much more focused and, therefore, suitable.
 - No two Students may use the same topic; it’s first-come, first-served on the topics. The reason for this request for uniqueness is to avoid repetition among the submitted CN-Rs. We are exploring the possibility of having a Forum where these CN-Rs can all be viewed in a Gallery.
 - Topics are claimed for individual use by submitting the choice of the single topic in an email to the Instructor, along with the list of related Articles, in the appropriate location within Laulima.
 - The first step is to define the Topic of interest. This is done by sifting through the current News from space and then by locating at least 2, but no more than 4, Cosmic News Articles about that **single topic**.
 - Online sources of Articles will be supplied by the Instructor; students may discover and use others on their own. The sources of the Articles must be reputable and not engaged in misinformation or disinformation.
 - Basic instructions on doing these Cosmic News assignments are available in the Text Headers of each Assignment. Additional information is also available in the Left Menu / Resources / Course Docs.
 - Once submitted, the Instructor will then review the Topic and Articles for uniqueness, significance, and relevance; once approved, the CN-A score will be entered, and the Student can then move on to preparing the Report.
 - If a CN-A is not submitted by the end of the 10-day Grace Period, a CN-R from the same Student cannot be accepted and that Grade is forfeit.
 - The CN-A assignment is worth 10 of the 100 points for the full CN-(A+R) assignment; the CN-A score amounts to 1% of the Course Grade.
 - The Grace Period here is the 10 days following the Topic and Articles’ Due Date; the Lateness Deduction is 5% per day, or fraction thereof.
 - After the Grace Period ends, all of the postings will continue to be visible; no new postings may be accepted after the end of the Grace Period.
 - There will be five (5) CN-A assignments in total.
 - The **best 4 of the 5 CN-A scores** will be counted toward the final grade.
 - The SLOs for each Module apply to these Assignments.

- **Cosmic News Reports (CN-R) (9% of the Course Grade):**
 - After submitting the Topic, receiving approval, and reviewing the Cosmic News Articles, the Students' second step is to compose a summary of the Articles and then to prepare the Cosmic News Report.
 - The CN-R must be factual and must adhere to Science; but it may conclude with the Student's own insights (clearly labeled as such) into the importance and relevance of the Articles. It should also connect with information being covered currently in the course.
 - The Grace Period here is the 3 days following the Report Due Date; the Lateness Deduction is 5% per day, or fraction thereof.
 - The Grade given for each Assignment will depend on the depth and breadth of the Report and on any subsequent related discussions by the author, with minimalist postings getting lower grades and well-thought-out postings getting higher grades.
 - Grammar and spelling are quite important. It will be useful to have someone with good language skills function as a proofreader for each Assignment before its submission. The Instructor will not act as a proofreader.
 - The Report is worth 90 of the 100 points for the full CN-(A+R) assignment; this amounts to 9% of the Course Grade.
 - There will be five (5) CN-R assignments in total.
 - The **best 4 of 5 CN-R scores** will be counted toward the final grade.
 - The SLOs for each Module apply to these Assignments.

- **Ask the Professor (AskP) (10% of the Course Grade):**
 - Twice in each of the five (5) Modules, in Forums set up for this purpose, each Student will be asked to pose two separate Questions on Module-related topics, which the Instructor will then explore in some detail.
 - The Questions asked must be thought-provoking Questions, exploring the information, and the implications thereof, presented in the Module.
 - Thought-provoking Questions do not include asking for the Instructor's opinion on any subject. Please review the wording of any Question posed, making sure it is focused on the science.
 - Unacceptable Questions are those which require simply looking up the answer in the text or online; there must be some depth to any Question asked. The Questions asked must make sense and must not contain errors in the science. Improper spelling, grammar, and/or sentence structure can disqualify a Question.
 - Questions based on hypothetical situations generally cannot be answered because they lack details. Generally, these Questions are rejected, but may be edited and improved.
 - If a Question is rejected, it may be reworked and resubmitted for credit without penalty, except for any relevant Lateness Deduction. If a Question is rejected and not resubmitted, its grade will be zero (0).
 - Ideally, resubmissions should be done before the Grace Period is reached. This implies that the original question was submitted well before the Due Date.

- The grade given for an accepted Question will depend on the quality of the Question, with a trivial Question getting a lower grade and a profound thought-provoking Question getting a higher grade.
 - Follow-up Questions from the same Student and/or from different Students are welcome.
 - After a Grace Period closes out, the Questions asked, and their Answers, will continue to be visible; no new Questions may be posted after that time.
 - There will be ten (10) AskP assignments in total.
 - The **best 8 of the 10 AskP** scores will be counted toward the final grade.
 - The SLOs for each Module apply to these Assignments.
- **Weekly Quizzes (WQs) (18% of the Course Grade):**
 - In each of the 15 Weeks of the term, there will be two (2) Weekly Quizzes (WQs). There are ten (10) questions in each WQ.
 - Each WQ is related to a specific Chapter in the Textbook.
 - Each WQ has a specific date of availability and a specific Due Date. Each continues to be available during a 3-day Grace Period, during which a 5%-per-day Lateness Deduction may be applied. After each Grace Period, the WQ becomes unavailable.
 - The WQs are timed, with each attempt being allotted thirty (30) minutes. A WQ may not be paused once it has begun.
 - Each WQ may be taken a maximum of three (3) times; the best score of the three is the one that will be recorded.
 - The **best 26 of the 30 WQ** scores will be counted toward the Final Grade.
 - The SLOs for each Module apply to these Assignments.
- **Module Tests (MTs) (22% of the Course Grade):**
 - Five (5) Tests, taken online through Lualima, will take place at approximately 3-week intervals. Each MT will cover all of the Chapters/Sections in one of the five Modules of the course.
 - Each Test will consist of 50 questions, randomly selected from a pool of multiple-choice and true/false questions.
 - The time allowed for each MT will be 75 minutes. Once a MT is opened, it may not be paused or cancelled.
 - Three (3) attempts at each MT will be permitted. The best score of the three will be the one recorded for grading.
 - The **best 4 of 5 MT** scores will be counted toward the final grade.
 - The SLOs for each Module apply to these Assignments.
- **Weekly Reflections (WRs) (5% of the Course Grade):**
 - There is a lot of interesting information in the news from space in this era.

- In the WR assignments, we'll be sharing the things we thought were most stunning about what the class has covered and what the world's news has brought in.
- In your post, let us all know what new facts and insights you thought most remarkable. Explain what was remarkable about what you learned and how that deepened your insights. Then comment on the thoughts of two of your fellow students, adding your own insights.
- Each WR is valued at 20 points. The initial posting will be worth a maximum of 14 points. The two (2) related comments are worth 3 points each. Other comments on the thoughts of other of your fellows are welcome and will add to the dialogue.

GRADING OF COURSE TASKS

The course grade will be computed as follows:

Assignment	Number	Max. Score
<i>First Week Introductions</i>	<i>1 (Extra Credit)</i>	<i>1%</i>
Projects	2	30%
Cosmic News	Best 4 of 5 (Drop 1)	10%
Ask the Professor	Best 13 of 15 (Drop 2)	10%
Weekly Quizzes	Best 26 of 30 (Drop 4)	20%
Module Tests	Best 4 of 5 (Drop 1)	25%
Weekly Reflections	15 (Drop 2)	5%
Total =		100%

Course work submitted after specified Due Dates will be subject to a Lateness Deduction, which will generally be 5% per calendar day late, or fraction thereof, after the Due Date. Lateness Deductions may be excused for a valid documented and verifiable reasons.

Assignment Grading will generally be completed within one week after the Due Date for that Assignment.

If a Grade is disputed, that dispute must be originated within three (3) weeks after the Due Date.

GRADING SCALE

The final letter grade will be based on the total percentage that the Student has earned from all the course tasks. Each letter grade and its respective level of achievement is provided in the following table:

Letter Grade	Definition
A	90% - 100% of cumulative points possible
B	80% - 89.99% of cumulative points possible
C	65% - 79.99% of cumulative points possible
D	50% - 64.99% of cumulative points possible
F	below 50% of cumulative points possible

Computed grades will not be rounded up.

Other grades may be assigned as listed in the WCC Catalog.

DISABILITIES ACCOMMODATION STATEMENT

If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Accessibility Counselor to discuss reasonable accommodations that will help you succeed in this class. Roy Inouye can be reached at (808) 235-7448, royinouy@hawaii.edu, or you may stop by Hale Kāko'o 106 for more information.

SEX DISCRIMINATION / GENDER-BASED VIOLENCE RESOURCES (TITLE IX)

Windward Community College is committed to providing a learning, working, and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking.

If you or someone you know is experiencing any of these, WCC has staff and resources to support and assist you. To report an incident of sex discrimination or gender-based violence, as well as receive information and support, please contact one of the following:

Jojo Miller, Confidential Advocate
 Phone: (808) 348-0663
 Email: advocate@hawaii.edu
 Office: Hale Kaka'o 110

Desrae Kahale, Mental Health Counselor & Confidential Resource
 Phone: (808) 235-7393
 Email: dkahale3@hawaii.edu
 Office: Hale Kāko'o 101

Karla K. Silva-Park, Title IX Coordinator
 Phone: (808) 235-7468
 Email: karlas@hawaii.edu
 Office: Hale 'Ākoakoa 220

As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and I cannot guarantee confidentiality, you will still have options about how your case will be handled. My goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need.

For more information regarding sex discrimination and gender-based violence, the University's Title IX resources and the University's Policy, Interim EP 1.204, go to manoa.hawaii.edu/titleix/

INCOMPLETE GRADE PROCEDURE

Incomplete grades are reserved for cases of illnesses and other emergencies that cause a Student to be unable to complete the course by the Last Day of Instruction. In such cases, the instructor has the option of issuing an "Incomplete" grade at the end of the semester. Requests for an "Incomplete" must be accompanied, in a timely manner, by substantive documentation. The Instructor must be notified of such issues in the shortest possible time; requests for an Incomplete grade must be made before the course is completed.

If granted, the "Incomplete" grade will then require a written agreement between the instructor and the Student clearly defining the remaining course requirements and the time frame within which they are to be completed. The College will review "I" grades six months subsequent to posting. Unresolved "I" grades will be converted to "F" grades subsequent to the review.

Be aware that active duty military can be charged for tuition for not completing a course as soon as 90 days after the end of the course if the "I" is not changed to a passing grade. Therefore, completing the course in a timely manner is prudent.

ACADEMIC INTEGRITY

Work submitted by a Student must be the Student's own work. The work of others should be explicitly marked, such as through use of quotes or summarizing with reference to the original author.

In this class, Students who commit academic dishonesty, cheating or plagiarism will have the following consequence(s):

- Students will receive a failing grade for plagiarized assignments.
- All cases of academic dishonesty are referred to the Vice Chancellor for Student Affairs.

ALTERNATE CONTACT INFORMATION

If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office:

- Location: Alaka'i 121
- Phone: (808) 235-7422

ADDITIONAL INFORMATION

- **Instructor Bio - Sean Moroney, PhD**
 - I've had a life-long interest in the sciences, with Physics as a particular favorite. I've taken a BS in Physics, a MS in Physics, and a PhD in Engineering Mechanics, with a specialty in Biomechanics. Astronomy, as exemplified in all of our space-age discoveries, has been a source of continued wonderment as everyone learns more and more about the Cosmos we are in.

- **Work Submitted Late**

- Work submitted after the Due Date will receive a Lateness Deduction of 5% per calendar day (or fraction thereof) for each day late. This will happen during the Grace Period which begins directly after the Due Date is past. Grace Periods are variable in length and tend to be no more than three (3) days in duration. If there are extenuating circumstances that can be documented, the Lateness Deductions may be waived, in whole or in part; however, the Instructor must be notified about the circumstances in the shortest possible time.

- **Missed Work**

- Generally, work not submitted will receive the grade of zero (0). It is the Student's responsibility to stay current with all the Assignments and to keep track of upcoming Due Dates; the Due Date Calendar, found in [Laulima / Resources / Calendars](#) is a useful aid in this regard.
- If there is a verifiable and documentable reason for the required work not being submitted, there may be a possibility that some accommodations can be made. Please see the Section below on Extenuating Circumstances.

- **Extenuating Circumstances**

- Life occasionally throws curves which can disrupt a Student's orderly progress through the Course. If such a case occurs, the Instructor must be contacted, without delay, as soon as is practicable, so that accommodations can be made. Documentation will be requested to support the actions taken.
- The Student and the Instructor will then discuss what steps are to be taken to get the affected Assignments completed and what that schedule will have to be. If an overly long time period has passed in which a sizable amount of coursework is not submitted, it may not be possible for more than a small fraction of that work to be eligible for completion.

- **Extra Credit**

- Extra Credit is not generally offered in this course. However, a small number of the lowest-graded assignments in most of the categories will be removed from the pool of scores contributing to the Final Grade. This will happen at the end of the term.

TECH SUPPORT SERVICES

Course Technology:

Learning Management System utilized by this course is [Laulima](#), accessible from the [WCC main web site](#), under "Services for Students" tab.

Hardware and Software Expectations:

Students should be comfortable operating a computer browser, such as Mozilla Firefox or Safari, using email, downloading and uploading files. In addition, Students should be comfortable using Adobe Acrobat Reader ([download the free software here](#)) and basics programs within Microsoft Office package (Word, Excel and PowerPoint). Microsoft Office can be obtained via University of

Hawai'i's [Information Technology Services](#). In addition, Students should make sure they have the free Adobe Acrobat Reader.

It is recommended that you:

- Use a more recent model desktop or laptop (2020 or later), either Windows or Mac.
- Have access to reliable high-speed Internet connection.
- Use Mozilla Firefox as your web browser, as Lualima is designed to work best with it. Note: that we do not recommend using Internet Explorer for submitting work or taking tests in Lualima.
- Depending on your browser settings, PDF files may open in a new window or tab or automatically download to your download folder

Other technical support:

University of Hawai'i's [Information Technology Services Help Desk](#) is available 24 hours a day, 7 days a week (including holidays) either via email (help@hawaii.edu) or by phone (808-956-2669).

Accessibility at UH and software accessibility information:

- University of Hawai'i's accessibility policies and services are available at the following link: [Accessibility at UH](#).
- To access the accessibility information for each software used in the course, follow the links below:
 - [Macintosh Accessibility Info](#)
 - [Mozilla Firefox Accessibility Info](#)
 - [Microsoft Office Accessibility Info](#)
 - [Adobe Acrobat Reader Accessibility Info](#)

ACADEMIC SUPPORT SERVICES

Tutorial services

Tutorial services are offered free of charge and are open to all WCC Students currently enrolled. Tutoring may be long-term, short-term, or single visit, depending upon the needs of the Student. To sign up for a tutor, refer to one of the many programs listed below:

- **Tutor.com:** The University of Hawaii Community Colleges offers free online, on-demand tutoring, through [Tutor.com](#).
- **TRiO Student Support Services (TRiO SSS):** The purpose of [TRiO SSS](#) is to provide services (everything from tutoring to filing taxes to financial aid and food) and to foster an institutional climate supportive of the success of low-income, first-generation, and/or disabled college Students.
- **Ho'onui Ike:** [Ho'onui Ike](#) is an academic assistance program that utilizes peer-assisted study and coaching sessions.
- **Ka Piko Student Success Services:** [Ka Piko Student Success Services](#) are free to all WCC Students and consist of the following resources (please follow the links below for more information):

- [Math Lab](#)
- [Writing Center](#)
- [Speech Lab](#)
- [Supplemental Instruction](#) (SI)
- [Peer Mentoring Center](#)

Other Student services

- [WCC Library](#), located in Hale La'akea, provides access to printed and digital books, periodicals, articles and more. In addition, it provides access to video and audio resources, as well as computers, individual and group study areas and rooms.
- [WCC Bookstore](#): textbooks, computers, software, food items and more can be purchased here.
- [Testing Center](#) (located in Hale La'akea) provides test proctoring services for placement tests, distance education online and written tests and make-up tests for campus courses.
- WCC [Counseling and Advising](#) department, located in Hale 'Ākoakoa 212, is comprised of college counselors, faculty and support staff who work to support Students' personal and academic growth and development.
- WCC [Mental Health and Wellness](#) provides a range of counseling services and activities on campus to support Students' life goals and academic goals.
- [Disabilities Services](#), located in Hale La'akea 232, provides information and services to Students with disabilities in order to perform functions that might otherwise be difficult or impossible. Testing and academic accommodations can include the following: tape recorded material, note takers, use of adaptive equipment and more.

COURSE DOCS IN LAULIMA

The Course Docs Section in the Resources Section of the Left Menu in Laulima is another critically important Section that contains some necessary information about the Assignments and other aspects of the Course.

The Course Docs Section should be reviewed carefully in the early Weeks of the Course.

CALENDAR OF ASSIGNMENTS

FIRST WEEK INTRODUCTIONS (FWI)

The FWI Assignment is DUE by the EOD
on 16 January 2024.

This is a WCC requirement. If not done,
there is a possibility of being dropped from the course.

CALENDARS OF DUE DATES

PROJECTS

Project	Available from	Due Date	Available to
Project 1 Topic	8 January	28 January	11 February
Project 1 Report	8 January	3 March	6 March
Project 2 Topic	4 March	31 March	14 April
Project 2 Report	4 March	3 May	6 May

ASK THE PROFESSOR (ASK-P)

AskP				
MODULE	ASK	OPEN	DUE	CLOSE
1	1	8 Jan	18 Jan	21 Jan
	2	18 Jan	28 Jan	31 Jan
2	3	29 Jan	8 Feb	11 Feb
	4	8 Feb	18 Feb	21 Feb
3	5	19 Feb	29 Feb	3 Mar
	6	29 Feb	10 Mar	13 Mar
4	7	11 Mar	28 Mar	31 Mar
	8	28 Mar	7 Apr	10 Apr
5	9	8 Apr	20 Apr	23 Apr
	10	20 Apr	30 Apr	3 May

COSMIC NEWS - ARTICLES (CN-As)

#	FROM	DUE	CLOSE
01	8 Jan	16 Jan	19 Jan
02	29 Jan	6 Feb	9 Feb
03	19 Feb	27 Feb	1 Mar
04	11 Mar	26 Mar	29 Mar
05	8 Apr	16 Apr	19 Apr

COSMIC NEWS - REPORTS (CN-Rs)

#	FROM	DUE	CLOSE
01	8 Jan	28 Jan	31 Jan
02	29 Jan	18 Feb	21 Jan
03	19 Feb	10 Mar	13 Mar
04	11 Mar	7 Apr	10 Apr
05	8 Apr	28 Apr	1 May

MODULE TESTS (MTs)

Module Test	Available from	Due Date	Available until
1	25 Jan	1 Feb	4 Feb
2	15 Feb	22 Feb	25 Feb
3	7 Mar	21 Mar	24 Mar
4	4 Apr	11 Apr	14 Apr
5	25 Apr	2 May	5 May

WEEKLY REFLECTIONS (WRs)

WEEK	FROM	DUE	CLOSE
01	12 Jan	15 Jan	16 Jan
02	19 Jan	22 Jan	23 Jan
03	26 Jan	29 Jan	30 Jan
04	2 Feb	5 Feb	6 Feb
05	9 Feb	12 Feb	13 Feb
06	16 Feb	19 Feb	20 Feb
07	23 Feb	26 Feb	27 Feb
08	1 Mar	4 Mar	5 Mar
09	8 Mar	11 Mar	12 Mar
10	15 Mar	25 Mar	26 Mar
11	29 Mar	1 Apr	2 Apr
12	5 Apr	8 Apr	9 Apr
13	12 Apr	15 Apr	16 Apr
14	19 Apr	22 Apr	23 Apr
15	26 Apr	29 Apr	30 Apr

WEEKLY QUIZZES (WQs)

MODULE	QUIZ	FROM	DUE	CLOSE
1	01	11 Jan	18 Jan	21 Jan
	02	11 Jan	18 Jan	21 Jan
	03	18 Jan	25 Jan	28 Jan
	04	18 Jan	25 Jan	28 Jan
	05	25 Jan	1 Feb	4 Feb
	06	25 Jan	1 Feb	4 Feb
2	07	1 Feb	8 Feb	11 Feb
	08	1 Feb	8 Feb	11 Feb
	09	8 Feb	15 Feb	18 Feb
	10	8 Feb	15 Feb	18 Feb
	11	15 Feb	22 Feb	25 Feb
	12	15 Feb	22 Feb	25 Feb
3	13	22 Feb	29 Feb	4 Mar
	14	22 Feb	29 Feb	4 Mar
	15	29 Feb	7 Mar	10 Mar
	16	29 Feb	7 Mar	10 Mar
	17	7 Mar	14 Mar	24 Mar
	18	7 Mar	14 Mar	24 Mar
4	19	14 Mar	28 Mar	31 Mar
	20	14 Mar	28 Mar	31 Mar
	21	28 Mar	4 Apr	7 Apr
	22	28 Mar	4 Apr	7 Apr
	23	4 Apr	11 Apr	14 Apr
	24	4 Apr	11 Apr	14 Apr
5	25	11 Apr	18 Apr	21 Apr
	26	11 Apr	18 Apr	21 Apr
	27	18 Apr	25 Apr	28 Apr
	28	18 Apr	25 Apr	28 Apr
	29	25 Apr	2 May	5 May
	30	25 Apr	2 May	5 May

COURSE CALENDAR

ASTR 110 OL (62078) – Spring 2024

Module	Module Focus	Date	Chapter - Title	
1	Overview of the Universe, the Perspective from Earth, Gravity, Light, & Astronomers' Tools	8 Jan - 14 Jan	1	Science and the Universe
			2	Observing the Sky
		15 Jan - 21 Jan	3	Orbits and Gravity
			4	Earth, Moon, and Sky
		22 Jan - 28 Jan	5	Radiation and Spectra
			6	Astronomical Instruments
2	The Solar System's Many Worlds, Their Moons, & Comparative Planetology	29 Jan - 4 Feb	7	Other Worlds
			8	Earth as a Planet
		5 Feb - 11 Feb	9	Cratered Worlds
			10	Earthlike Planets
		12 Feb - 18 Feb	11	The Giant Planets
			12	Rings, Moons, and Pluto
3	The Debris of the Solar System, the Sun, Starlight, & Stellar Characteristics and Classifications	19 Feb - 25 Feb	13	Comets and Asteroids
			14	Cosmic Samples and Origins
		26 Feb - 3 Mar	15	The Sun: A Garden-Variety Star
			16	The Sun: A Nuclear Powerhouse
		4 Mar - 10 Mar	17	Analyzing Starlight
			18	The Stars
Spring Recess			18 – 24 March	
4	The Space Between the Stars, Star Formation, the Exoplanets, Stellar Evolution, Death, & End-Stages	11 Mar - 17 Mar	19	Celestial Distances
			20	Between the Stars
		25 Mar – 31 Mar	21	The Birth of Stars
			22	Stars from Adolescence to Old Age
		1 Apr – 7 Apr	23	The Death of Stars
			24	Black Holes
5	Galaxies, Their Types and Evolution, The Big Bang, Dark Matter, & Astrobiology	8 Apr - 14 Apr	25	The Milky Way Galaxy
			26	Galaxies
		15 Apr - 21 Apr	27	Active Galaxies and Quasars
			28	Evolution and Distribution of Galaxies
		22 Apr – 1 May	29	The Big Bang
			30	Life in the Universe
CONCLUSION and SUMMATION			2 – 5 May	
		10 May 2024	Spring Semester Ends	

