

Washtenaw Community College Comprehensive Report

AST 111 General Astronomy Effective Term: Winter 2020

Course Cover

Division: Math, Science and Engineering Tech

Department: Physical Sciences

Discipline: Astronomy

Course Number: 111

Org Number: 12310

Full Course Title: General Astronomy

Transcript Title: General Astronomy

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Three Year Review / Assessment Report

Change Information:

Consultation with all departments affected by this course is required.

Course description

Outcomes/Assessment

Objectives/Evaluation

Other:

Rationale: The syllabus requires updating since the last iteration was completed a decade ago.

Adjustments include an emphasis on aspects implemented to bolster the course's advantageous MTA accreditation.

Proposed Start Semester: Fall 2019

Course Description: In this course, students will learn about discoveries concerning planets beyond the Solar System (exoplanets) and the evolution of the Universe (cosmology). Students will likewise be introduced to interesting resources such as NASA's Planet Hunters citizen science project, the Hubble Space Telescope archive and advanced smartphone apps that chart constellations and the night-sky in real-time. Students will also develop skills pertinent to carrying out laboratory work, scientific research, basic arithmetic and visual exercises tied to astronomy.

Course Credit Hours

Variable hours: No

Credits: 3

Lecture Hours: Instructor: 30 Student: 30

Lab: Instructor: 30 Student: 30

Clinical: Instructor: 0 Student: 0

Total Contact Hours: Instructor: 60 Student: 60

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 3

Requisites

General Education

MACRAO

MACRAO Science & Math

General Education Area 4 - Natural Science

Assoc in Applied Sci - Area 4

Assoc in Science - Area 4

Assoc in Arts - Area 4

Michigan Transfer Agreement - MTA

MTA Lab Science

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify principles tied to celestial cycles and the history of astronomy, planets, starlight and stars, galaxies and cosmology.

Assessment 1

Assessment Tool: Departmental tests

Assessment Date: Winter 2021

Assessment Cycle: Every Two Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmental tests are scored using an answer key.

Standard of success to be used for this assessment: 75% of students will score greater than 70%

Who will score and analyze the data: Astronomy faculty

2. Perform laboratory experiments, scientific research and apply math principles to data collection and analysis.

Assessment 1

Assessment Tool: Labs

Assessment Date: Winter 2021

Assessment Cycle: Every Two Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmental labs are scored using an answer key.

Standard of success to be used for this assessment: 75% of students will score greater than 70%

Who will score and analyze the data: Astronomy faculty

3. Perform observations of the cosmos.

Assessment 1

Assessment Tool: Observing project

Assessment Date: Winter 2021

Assessment Cycle: Every Two Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: The departmental observing project is scored pass/fail using a simple set of instructions.

Standard of success to be used for this assessment: 75% of students will score greater than 70%

Who will score and analyze the data: Astronomy faculty

Course Objectives

1. Explain the seasons, the celestial sphere, and celestial navigation.
2. Describe why Solar and Lunar eclipses are visible.
3. Differentiate between the geometric and heliocentric systems.
4. Cite the contributions of individuals such as Ptolemy, Copernicus, Kepler, Galileo, & Newton.
5. Differentiate between Terrestrial and Jovian planets.
6. Explain how exoplanets are discovered.
7. Comprehend the history and ramifications of asteroids striking Earth.
8. Define spectroscopy and what starlight conveys.
9. Characterize different types of telescopes.
10. Describe how the size of a telescope impacts the resolution.
11. Describe the Sun's structure and cycles.
12. Comprehend the nuclear fusion process powering the Sun.
13. List the stellar evolution paths for stars of different masses.
14. Identify where elements stem from.
15. Define the types of galaxies and their structure.
16. Explain the origins of dark matter and dark energy.
17. Comprehend the evidence for a Big Bang and evolutionary scenarios for the Universe.
18. Combine measurements to yield a more reliable result, and compute the associated uncertainty.
19. Assess whether two scientific results agree to within the uncertainties (e.g., known value, and a finding derived in the lab).
20. Construct and interpret graphs, and plot data with their associated uncertainties.
21. Calculate quantitative expressions using powers of 10 notation.
22. Carry out visual observations of the cosmos with the aid of a smartphone app.

New Resources for Course

Course Textbooks/Resources

Textbooks

Schneider, S., T. Arny. *Pathways to Astronomy*, 5 ed. McGraw Hill, 2017

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Daniel Majaess</i>	<i>Faculty Preparer</i>	<i>Jun 18, 2019</i>
Department Chair/Area Director: <i>Suzanne Albach</i>	<i>Recommend Approval</i>	<i>Jun 21, 2019</i>
Dean: <i>Kimberly Jones</i>	<i>Recommend Approval</i>	<i>Jul 02, 2019</i>
Curriculum Committee Chair: <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Aug 14, 2019</i>
Assessment Committee Chair: <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Sep 20, 2019</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Sep 26, 2019</i>