Authorizing Signature: Scott Agle

Date: 12/17/2018

LEHIGH CARBON COMMUNITY COLLEGE

MASTER COURSE OUTLINE

for

Prefix: AST No.: 105 Name: Introduction to Astronomy

School/Division:	Science Division/Physics
Submitted by:	Deepika Chhabria
Course Origination Date:	March 1985
Review Date:	November 2018
Credit Hours:	3
Lecture Hours:	3
Laboratory Hours:	0
Other:	
Prerequisite(s):	ENG 100 or LCCC English Placement Testing score of 57 or a Sentence Structure score >/= to 57 or Written Essay Score of 4 and LCCC Reading Placement Testing score of 94 and MAT 090 or MAT 100 or LCCC Algebra Placement Testing score of 77
Corequisite(s):	None

Course Description

This course is designed for individuals who want to explore the universe around them. Topics of discussion will include Big Bang, scale and history of the universe, galaxies and planets, a thorough treatment of the solar system, structure of earth and sun.

Course Objective/Competency

(for each objective, identify program objective accreditation standard, and/or collegewide student competency or N/A)

Course Objective	Program Objective and/or Collegewide Student Competency
1. Apply Scientific Method	
2. Locate and critically evaluate scientific information to develop student perspective about the universe	
3. Introduce key concepts of Astronomy	
4. Thorough knowledge of our solar system and beyond	

Course Objective	Program Objective and/or Collegewide Student Competency
5. Using concepts of Physics: Motion, Energy, gravity to understand Universe	
6. Discuss light as our cosmic messenger	
7. Formation of Planets	
8. A closer look at the sun-earth connection	

Course Content
(please provide chapter-level detail)

I. Overview
   a. Discuss our place in the universe
   b. Describe Big Bang Theory
   c. Discuss how the universe was like in the past
   d. Comparative analysis of the scale of the universe
   e. Compare our lifetimes to the age of the universe
   f. Discuss cosmic calendar
   g. Describe the relative motion of the Earth, Solar System, Milky Way Galaxy and the Universe

II. Discovering the Universe
   a. Discuss and describe the patterns in the night sky.
   b. Describe why stars rise and set.
   c. Describe angular sizes and distances.
   d. Describe the reasons for seasons on earth.
   e. Describe what causes solar and lunar eclipses.
   f. Describe the phases of the Moon.

III. The Science of Astronomy
   a. Describe the use of scientific thinking for humans.
   b. Discuss the astronomical observation achievements and benefits to the ancient societies.
   c. Describe the contribution of the Greeks and Islamic scientists to the field of science.
   d. Explain the Copernicus, Tycho and Kepler theory of planetary motion.
   e. Describe the difference between science and non-science.
   f. Describe the meaning of scientific theory.

IV. Understanding Motion, Energy and Gravity
   a. Describe and define Motion: speed, velocity and acceleration.
   b. Explain the difference between mass and weight.
   c. Describe three Newton's Laws of Motion.
   d. Discuss and applying Newton's law to the universe.
   e. Describe different forms of energy: Kinetic, Potential, Thermal and Radiative Energy
   f. Discuss the conservation laws in Astronomy: Conservation of Energy and Conservation of Angular Momentum
   g. Describe Newton's Universal law of gravitation.

h. Discuss the extension of Kepler's Laws using Newton's law of gravity.
i. Describing orbits using gravity and energy.
j. Describe how gravity causes tides.

V. Light
a. Describe the basic properties of light and matter.
b. Explain how light and matter interact with each other.
c. Describe three basic types of spectra: Continuous Spectrum, Emission Line Spectrum and Absorption Line Spectrum.
d. Explain the enormous information we get from light: what things are made of, temperatures of the planet, speed of a distant star.
e. Describe the contribution of telescopes in understanding of the universe.
f. Describe how the technology is revolutionizing astronomy.

VI. Our Solar System
a. Discuss and explain the clues to the formation of our solar system.
b. Discuss the birth of Solar System.
c. Discuss the reason behind the orderly patterns of motion in our solar system.
d. Describe two forms of planet: Terrestrial planets and Jovian planets.
e. Discuss the Formation, Nature, Orbits and Impacts of asteroids and comets.
f. Discuss Criteria for dwarf planet
g. Explain the existence of our moon and other exceptions to the rules.
h. Discuss when planets were formed.
i. Describe the detection strategies to detect planets around other stars.
j. Compare the extrasolar planets with planets in our solar system.

VII. Sun
a. Explain the structure of Sun and the reason behind its luminosity.
b. Explain the process of fusion inside sun producing energy.
c. Discuss several solar activities: sunspots, sun prominences and solar flares.
d. Explain the sunspot cycle and its effect on earth's climate.

VIII. Dark Matter and Dark Energy
a. Discuss unseen Influence in the Cosmos.
b. Discuss the evidence of dark matter.
c. Discuss the role of dark matter in galaxy formation.
d. Discuss the expansion of universe.

Advisement Comments

Grading Procedures

Grades may be based on a combination of objective exams/quizzes, in-class or online assignments, homework assignments, discussion boards, and class participation.

Textbook(s)

A textbook such as:

The Essential Cosmic Perspective, Jeffrey O. Bennett, Megan O. Donahue, Nicholas Schneider, and Mark Voit, 7th Edition, 2014.

Bibliography

Articles from general readership magazines/news websites (e.g. astronomy.com, ScienceDaily.com, Discovery, Universe Today) related to course material being covered, at the instructor's discretion. Appropriate videos, journal articles and introductory astronomy textbooks and other useful readings should be kept on reserve in the library.

PERM AST105
11/13/18

OFFICIAL (AC)

Lehigh Carbon Community College

Prefix: AST No.: 105 Title: Introduction to Astronomy Date: November 2018

Course-Specific Student Learning/Collegewide Competencies

#1	#2	#3	#4	#5	#6	#7	#8
Course Learning Objective	**Accred Std #**	**Prg Obj #**	***CWC #**	**What tool will be used to measure the objective? (Assessment Method)**	**How will the tool be measured? (Criteria for Success)**	**Measurement Tool Grading Scale (Numeric)**	**How will the measurement outcome be reported?**
Apply Scientific Method							
Locate and critically evaluate scientific information to develop student perspective about the universe							
Introduce key concepts of Astronomy							
Thorough knowledge of our solar system and beyond							
Using concepts of Physics: Motion, Energy, gravity to understand Universe							
Discuss light as our cosmic messenger							
Formation of Planets							
A closer look at the sun-earth connection							

CWC KEY: *#1-Think critically; #2-Communicate effectively; #3-Apply quantitative reasoning; #4-Participate cooperatively within a team; #5-Use current technology effectively; #6-Apply information literacy skills; #7-Analyze human diversity; #8-Apply scientific reasoning; #9-Evaluate ethical aspects of decision making

Authorizing Signature: _____

Date: 2/3/2016

LEHIGH CARBON COMMUNITY COLLEGE

MASTER COURSE OUTLINE

for

AST 105 - INTRODUCTION TO ASTRONOMY

Division/Department:	Science Division/Physics
Submitted by:	Deepika Chhabria
Course Origination Date:	March 1985
Review Date:	February 2015
Credit Hours:	3
Lecture Hours:	3
Laboratory Hours:	0
Other:	
Prerequisite(s):	Successful completion of ENG 100 (or COMPASS writing score of at least 66 and COMPASS reading score of at least 79), and successful completion of MAT 100 (or COMPASS Pre-Algebra score of at least 41 and Algebra score of at least 31).
Corequisite(s):	None

Course Description

This course is designed for individuals who want to explore the universe around them. Topics of discussion will include Big Bang, scale and history of the universe, galaxies and planets, a thorough treatment of the solar system, structure of earth and sun.

Course Objectives

1. Apply Scientific Method
2. Locate and critically evaluate scientific information to develop student perspective about the universe
3. Introduce key concepts of Astronomy
4. Thorough knowledge of our solar system and beyond
5. Using concepts of Physics: Motion, Energy, gravity to understand Universe
6. Discuss light as our cosmic messenger
7. Formation of Planets
8. A closer look at the sun-earth connection

Course Content

I. Overview
   a. Discuss our place in the universe
   b. Describe Big Bang Theory
   c. Discuss how the universe was like in the past
   d. Comparative analysis of the scale of the universe
   e. Compare our lifetimes to the age of the universe
   f. Discuss cosmic calendar
   g. Describe the relative motion of the Earth, Solar System, Milky Way Galaxy and the Universe

II. Discovering the Universe
   a. Discuss and describe the patterns in the night sky.
   b. Describe why stars rise and set.
   c. Describe angular sizes and distances.
   d. Describe the reasons for seasons on earth.
   e. Describe what causes solar and lunar eclipses.
   f. Describe the phases of the Moon.

III. The Science of Astronomy
   a. Describe the use of scientific thinking for humans.
   b. Discuss the astronomical observation achievements and benefits to the ancient societies.
   c. Describe the contribution of the Greeks and Islamic scientists to the field of science.
   d. Explain the Copernicus, Tycho and Kepler theory of planetary motion.
   e. Describe the difference between science and non-science.
   f. Describe the meaning of scientific theory.

IV. Understanding Motion, Energy and Gravity
   a. Describe and define Motion: speed, velocity and acceleration.
   b. Explain the difference between mass and weight.
   c. Describe three Newton's Laws of Motion.
   d. Discuss and applying Newton's law to the universe.
   e. Describe different forms of energy: Kinetic, Potential, Thermal and Radiative Energy
   f. Discuss the conservation laws in Astronomy: Conservation of Energy and Conservation of Angular Momentum
   g. Describe Newton's Universal law of gravitation.
   h. Discuss the extension of Kepler's Laws using Newton's law of gravity.
   i. Describing orbits using gravity and energy.
   j. Describe how gravity causes tides.

V. Light
   a. Describe the basic properties of light and matter.
   b. Explain how light and matter interact with each other.
   c. Describe three basic types of spectra: Continuous Spectrum, Emission Line Spectrum and Absorption Line Spectrum.
   d. Explain the enormous information we get from light: what things are made of, temperatures of the planet, speed of a distant star.

e. Describe the contribution of telescopes in understanding of the universe.
f. Describe how the technology is revolutionizing astronomy.

VI. Our Solar System
a. Discuss and explain the clues to the formation of our solar system.
b. Discuss the birth of Solar System.
c. Discuss the reason behind the orderly patterns of motion in our solar system.
d. Describe two forms of planet: Terrestrial planets and Jovian planets.
e. Discuss the Formation, Nature, Orbits and Impacts of asteroids and comets.
f. Discuss Criteria for dwarf planet
g. Explain the existence of our moon and other exceptions to the rules.
h. Discuss when planets were formed.
i. Describe the detection strategies to detect planets around other stars.
j. Compare the extrasolar planets with planets in our solar system.

VII. Sun
a. Explain the structure of Sun and the reason behind its luminosity.
b. Explain the process of fusion inside sun producing energy.
c. Discuss several solar activities: sunspots, sun prominences and solar flares.
d. Explain the sunspot cycle and its effect on earth's climate.

VIII. Dark Matter and Dark Energy
a. Discuss unseen Influence in the Cosmos.
b. Discuss the evidence of dark matter.
c. Discuss the role of dark matter in galaxy formation.
d. Discuss the expansion of universe.

Grading Procedures

Grades may be based on a combination of objective exams/quizzes, in-class or online assignments, homework assignments, discussion boards, and class participation.

Textbook(s)

A textbook such as:

The Essential Cosmic Perspective, Jeffrey O. Bennett, Megan O. Donahue, Nicholas Schneider, and Mark Voit, 7th Edition, 2014.

Bibliography

Articles from general readership magazines/news websites (e.g. astronomy.com, ScienceDaily.com, Discovery, Universe Today) related to course material being covered, at the instructor's discretion. Appropriate videos, journal articles and introductory astronomy textbooks and other useful readings should be kept on reserve in the library.

LEHIGH CARBON COMMUNITY COLLEGE

Course - Collegewide Student Learning Competencies

Collegewide Student Learning Competencies	Check if addressed by this course	Describe tools used for measurement
1. Think critically	X	Exams, quizzes, laboratory reports, laboratory experiential evaluations, in-class group assignments
2. Communicate effectively		
3. Apply quantitative reasoning		
4. Participate cooperatively within a team		
5. Use current technology effectively		
6. Apply information literacy skills		
7. Analyze human diversity		
8. Apply scientific reasoning	X	Exams, quizzes, in-class assignments, online assignments
9. Evaluate ethical aspects of decision making		

PERM AST105
2/18/15

OFFICIAL

Lehigh Carbon Community College

Course Number and Title: AST 105- Introduction to Astronomy Date: February 2015

Course-Specific Student Learning Competencies

Objective	Means for Addressing Objective	Means for Measuring Objective
Apply scientific method	Textbook, Homework, Lecture, Class discussion	Quiz, Homework, Exams
Locate and critically evaluate scientific information to develop student perspective about the universe	Textbook, Homework, Lecture, Class discussion	Quiz, Homework, Exams
Introduce key concepts of Astronomy	Textbook, Homework, Lecture, Class discussion	Quiz, Homework, Exams
Thorough knowledge of our solar system	Textbook, Homework, Lecture, Class discussion, videos, discussion boards	Quiz, Homework, Exams
Using concepts of Physics: Motion, Energy, gravity to understand Universe	Textbook, Homework, Lecture, Class discussion	Quiz, Homework, Exams
Discuss light as our cosmic messenger	Textbook, Homework, Lecture, Class discussion	Quiz, Homework, Exams
Formation of Planets	Textbook, Homework, Lecture, Class discussion, videos, Discussion Boards	Quiz, Homework, Exams
A closer look at the sun-earth connection	Textbook, Homework, Lecture, Class discussion, videos, Discussion Boards	Quiz, Homework, Exams

PERM AST105
2/18/15

Authorizing Signature: _____

Date: _____

LEHIGH CARBON COMMUNITY COLLEGE

MASTER COURSE OUTLINE

for

AST 105 Introduction to Astronomy

Division/Department:	Science Division/Physics
Submitted by:	Deepika Chhabria
Course Origination Date:	March 1985
Review Date:	February 2015
Credit Hours:	3
Lecture Hours:	3
Laboratory Hours:	0
Other:	0
Prerequisite(s):	Successful completion of ENG 100 (or COMPASS writing score of at least 66 and COMPASS reading score of at least 79), and successful completion of MAT 100 (or COMPASS Pre-Algebra score of at least 41 and Algebra score of at least 31).
Corequisite(s):	None

Course Description

This course is designed for individuals who want to explore the universe around them. Topics of discussion will include Big Bang, scale and history of the universe, galaxies and planets, a thorough treatment of the solar system, structure of earth and sun.

Course Objectives

1. Apply Scientific Method
2. Locate and critically evaluate scientific information to develop student perspective about the universe
3. Introduce key concepts of Astronomy
4. Thorough knowledge of our solar system and beyond
5. Using concepts of Physics: Motion, Energy, gravity to understand Universe
6. Discuss light as our cosmic messenger
7. Formation of Planets
8. A closer look at the sun-earth connection

Course Content

I. Overview
   a. Discuss our place in the universe
   b. Describe Big Bang Theory
   c. Discuss how the universe was like in the past
   d. Comparative analysis of the scale of the universe
   e. Compare our lifetimes to the age of the universe
   f. Discuss cosmic calendar
   g. Describe the relative motion of the Earth, Solar System, Milky Way Galaxy and the Universe

II. Discovering the Universe
   a. Discuss and describe the patterns in the night sky.
   b. Describe why stars rise and set.
   c. Describe angular sizes and distances.
   d. Describe the reasons for seasons on earth.
   e. Describe what causes solar and lunar eclipses.
   f. Describe the phases of the Moon.

III. The Science of Astronomy
   a. Describe the use of scientific thinking for humans.
   b. Discuss the astronomical observation achievements and benefits to the ancient societies.
   c. Describe the contribution of the Greeks and Islamic scientists to the field of science.
   d. Explain the Copernicus, Tycho and Kepler theory of planetary motion.
   e. Describe the difference between science and non-science.
   f. Describe the meaning of scientific theory.

IV. Understanding Motion, Energy and Gravity
   a. Describe and define Motion: speed, velocity and acceleration.
   b. Explain the difference between mass and weight.
   c. Describe three Newton's Laws of Motion.
   d. Discuss and applying Newton's law to the universe.
   e. Describe different forms of energy: Kinetic, Potential, Thermal and Radiative Energy
   f. Discuss the conservation laws in Astronomy: Conservation of Energy and Conservation of Angular Momentum
   g. Describe Newton's Universal law of gravitation.
   h. Discuss the extension of Kepler's Laws using Newton's law of gravity.
   i. Describing orbits using gravity and energy.
   j. Describe how gravity causes tides.

V. Light
   a. Describe the basic properties of light and matter.
   b. Explain how light and matter interact with each other.
   c. Describe three basic types of spectra: Continuous Spectrum, Emission Line Spectrum and Absorption Line Spectrum.
   d. Explain the enormous information we get from light: what things are made of, temperatures of the planet, speed of a distant star.
   e. Describe the contribution of telescopes in understanding of the universe.

f. Describe how the technology is revolutionizing astronomy.

VI. Our Solar System
a. Discuss and explain the clues to the formation of our solar system.
b. Discuss the birth of Solar System.
c. Discuss the reason behind the orderly patterns of motion in our solar system.
d. Describe two forms of planet: Terrestrial planets and Jovian planets.
e. Discuss the Formation, Nature, Orbits and Impacts of asteroids and comets.
f. Discuss Criteria for dwarf planet
g. Explain the existence of our moon and other exceptions to the rules.
h. Discuss when planets were formed.
i. Describe the detection strategies to detect planets around other stars.
j. Compare the extrasolar planets with planets in our solar system.

VII. Sun
a. Explain the structure of Sun and the reason behind its luminosity.
b. Explain the process of fusion inside sun producing energy.
c. Discuss several solar activities: sunspots, sun prominences and solar flares.
d. Explain the sunspot cycle and its effect on earth's climate.

VIII. Dark Matter and Dark Energy
a. Discuss unseen Influence in the Cosmos.
b. Discuss the evidence of dark matter.
c. Discuss the role of dark matter in galaxy formation.
d. Discuss the expansion of universe.

Grading Procedures

Grades may be based on a combination of objective exams/quizzes, in-class or online assignments, homework assignments, discussion boards, and class participation.

Textbook(s)

A textbook such as:

The Essential Cosmic Perspective, Jeffrey O. Bennett, Megan O. Donahue, Nicholas Schneider, and Mark Voit, 7th Edition, 2014

Bibliography

Articles from general readership magazines/news websites (e.g. astronomy.com, ScienceDaily.com, Discovery, Universe Today) related to course material being covered, at the instructor's discretion. Appropriate videos, journal articles and introductory astronomy textbooks and other useful readings should be kept on reserve in the library.

Course - Collegewide Student Learning Competencies

Collegewide Student Learning Competencies	Check if addressed by this course	Describe tools used for measurement
1. Think critically	X	Exams, quizzes, laboratory reports, laboratory experiential evaluations, in-class group assignments
2. Communicate effectively		
3. Apply quantitative reasoning		
4. Participate cooperatively within a team		
5. Use current technology effectively		
6. Apply information literacy skills		
7. Analyze human diversity		
8. Apply scientific reasoning	X	Exams, quizzes, in-class assignments, online assignments
9. Evaluate ethical aspects of decision making		

Lehigh Carbon Community College

Course Number and Title: AST 105- Introduction to Astronomy Date: 10/23/2014

Course-Specific Student Learning Competencies

Objective	Means for Addressing Objective	Means for Measuring Objective
Apply scientific method	Textbook, Homework, Lecture, Class discussion	Quiz, Homework, Exams
Locate and critically evaluate scientific information to develop student perspective about the universe	Textbook, Homework, Lecture, Class discussion	Quiz, Homework, Exams
Introduce key concepts of Astronomy	Textbook, Homework, Lecture, Class discussion	Quiz, Homework, Exams
Thorough knowledge of our solar system	Textbook, Homework, Lecture, Class discussion, videos, discussion boards	Quiz, Homework, Exams
Using concepts of Physics: Motion, Energy, gravity to understand Universe	Textbook, Homework, Lecture, Class discussion	Quiz, Homework, Exams
Discuss light as our cosmic messenger	Textbook, Homework, Lecture, Class discussion	Quiz, Homework, Exams
Formation of Planets	Textbook, Homework, Lecture, Class discussion, videos, Discussion Boards	Quiz, Homework, Exams
A closer look at the sun-earth connection	Textbook, Homework, Lecture, Class discussion, videos, Discussion Boards	Quiz, Homework, Exams

PERM AST105

Approved by: _____
(Division Representative) (date)

Recommended by: _____
(Curriculum Committee Co-Chair) (date)

_____
(Associate Dean of Professional Accreditation and Curriculum) (date)

_____
(Dean of Academic Services) (date)

Approved by: _____
(Vice President for Academic Services and Student Development) (date)

c: Applicant , Division Representative, Academic Services Support Supervisor, Curriculum Co-Chair, Associate Dean of Professional Accreditation and Curriculum, Dean of Students, Director of Advising Services, Transfer Counselor, Director of Enrollment Services, Director of Admissions, Associate Dean of Institutional Advancement, Associate Dean of Institutional Research and Effectiveness, Library Archives, Word Processing, Financial Aid, Veteran's Office

LEHIGH CARBON COMMUNITY COLLEGE
CURRICULUM COMMITTEE

COURSE PROPOSAL FORM

NOTE: All proposals must be submitted electronically (except photocopies of current catalog pages) two weeks prior to scheduled next meeting. One paper copy with original signature in **blue** ink must be submitted to the Associate Dean of Professional Accreditation and Curriculum.

1. Submitted by: Deepika Chhabria
   a. Date submitted: Oct. 2014
   b. Effective date of implementation (check one and fill in the appropriate year)
      Spring _____
      Fall _____

2. Name of course (include course prefix, number and title):
   Current Name (N/A if course doesn't exist): AST 201-Introduction to Astronomy
   New Name: AST 105- Introduction to Astronomy

3. Nature of proposal
   New course
   Deletion of course
   Reinstatement of previously deleted course
   X Revised course
      Course title change
      X Course number change
      Course prefix change
      X Change in prerequisites/corequisites
      Change in course description

Change in number of credits/hours
Change in objectives/content
Change in resources
Change in elective status
Other: _____

4. Describe the change:
Course # has been updated & Pre-requisite for the course has been updated from MAT 099 to MAT 100

5. Rationale for new course or revision (why):
Subject material covered in the course is 100 level course.

6. Course information

	Current	Revised/New	
a.	3	_____	Credit hours
b.	3	_____	Lecture hours per week
c.	_____	_____	Laboratory hours per week
d.	_____	_____	Cooperative education hours per week
e.	_____	_____	Internship hours per week
f.	_____	_____	Clinical hours per week
g.	_____	_____	Duration, if different from full semester (no. of weeks)
h.	_____	_____	Suggested number of weekly meetings

i. Prerequisites
Current: MAT 099- Prealgebra
New: MAT 100- Beginning Algebra

j. Corequisites
Current: _____
New: _____

7. Course description (Revised/New) (Identify different content/text):
_____

8. Does this proposal affect other courses or programs? Yes No
If yes, how? _____

9. Has the Director of Enrollment Services approved the course number?
Yes _____ Not applicable
(Director of Enrollment Services signature) (date)

10. Has the appropriate advisory committee or affiliated professional organization reviewed this proposal?
Yes _____ Not applicable
(Name of advisory committee/professional organization) (date)

No _____
(Explain)

PERM23-vv
8/21/13

COMPLETE REMAINING QUESTIONS FOR SUBSTANTIVE CHANGES

11. This course is designed for: Career Transfer Both

12. This course will count as: (Check all that apply)
    a. A required course in _____ (name of program/s)
    b. X Free elective
    c. Program elective _____ (name of program/s)
        Required
        Recommended
    d. General Education elective
        English
        Humanities
        Math
        X Science
        Social Science
    e. No credit toward graduation

13. Recommended class maximum: _____

    Rationale: _____

14. This course typically transfers to four-year institutions
        as a program specific course
        as an elective
        as a specialized topic course
        does not transfer

    Comments: _____

15. Does any material in this course duplicate instruction in any existing course?
        Yes, please comment:

        _____

        No

16. Are there sufficient resources currently available?

a.	Facilities and equipment:	Yes	No
b.	Instructional and supplemental materials:	Yes	No
c.	Library resources:	Yes	No
c.	Staffing:	Yes	No

    Comments: _____

17. Special requirements:
    a. Laboratory Fee Required
        Yes, Recommended Amount $_____
        No
    b. Other Considerations

---

18. If your proposal is a new or revised course:
    a. Attach completed Course Proposal Form
    b. Attach completed Master Course Outline
    c. Attach completed Course Collegewide Student Learning and Course-Specific Student Learning Competency Grids

Authorizing Signature:
Date:

LEHIGH CARBON COMMUNITY COLLEGE

COURSE OUTLINE

for

AST 201 – INTRODUCTION TO ASTRONOMY

Division/Department:	Sciences
Credit Hours:	3
Lecture Hours:	3
Laboratory Hours:	0
Other:	0
Course Origination Date:	March 15, 1985
Reviewed/Revised Date:	Spring 2007
Submitted by:	
Prerequisite(s):	None
Corequisite(s):	None

Course Description

This course is designed for individuals who want to explore the universe around them. Topics of discussion will include archaeoastronomy (astronomy of the ancients), eclipses of the sun and moon, a thorough treatment of the solar system, the life and death of stars, as well as instrumentation and techniques of observation. Students will gain familiarity with the night sky through numerous planetarium demonstrations and several observing sessions using telescopes and binoculars.

Course Objectives

1. To provide students with an accurate up-to-date informational portrait of the science of astronomy.

2. To provide students with the opportunity to become familiar with the many facets of the night sky through planetarium demonstrations and observing sessions utilizing telescopes.

3. To show the validity of the process of science in problem solving situations.

4. To demonstrate the interdisciplinary nature of astronomy as it relates to other branches of science, mathematics and the humanities.

5. To provide the type of classroom atmosphere in which a nonscience-oriented individual feels that he or she has the opportunity to succeed.

Course Content

Session 1: Introductory astronomy; A survey of the science of astronomy; Planetarium--seasonal effects from various latitudes; Movie, Universe

Session 2: Archaeoastronomy--focus on ancient Egyptian astronomy and Stonehenge; Planetarium demonstrations; Movie, The Mystery of Stonehenge

Session 3: Eclipses of the sun and the moon; Planetarium demonstrations; Star identification 1

Session 4: Telescopes and their accessories; Demonstration of various types of spectra utilizing a spectroscope; Movies, Journey into Light and Doppler Shift

Session 5: The moon; Observations of the moon through a telescope

Session 6: Hour exam; Introduction to the solar system

Session 7: Mercury, Venus, Earth, Mars; Movie, Mariner 10; Star identification 2

Session 8: Film, Mars the Search Begins; Jupiter, Saturn, Uranus, Neptune, Pluto; Star identification 3

Session 9: Comets, meteors and meteorites; Prospects for viewing Halley's Comet

Session 10: Hour exam; The sun: star of our solar system

Session 11: Nighttime telescopic observing session at South Mountain Preserve of the Lehigh Valley Conservancy

Session 12: Stars and the Hertzsprung-Russell diagram; Star identification and review

Session 13: Star identification quiz; Stellar evolution

Session 14: The Milky Way galaxy and beyond

Session 15: Telescopic observing session at Kutztown University Observatory

Session 16: Final exam; A primer in special relativity

Grading Procedures

A student's final grade will be based upon the number of points accumulated by the individual, divided by the total number of points possible. These will be gleaned from the following criteria:

1. Examinations: There will be two, one-hour tests and a final examination. A sky identification exam will be given in the planetarium. The tests will be objective in nature.

2. Quizzes: Several unannounced quizzes will be administered during the semester. Each quiz will be approximately 15 minutes in duration and consist of questions which will be answered in written form.

3. Written Work: Five short writing exercises will be assigned to help cultivate the ability of students to explain lucidly the content material.

4. Participation: Meaningful participation will be acknowledged through additional credit which could significantly alter a student's grade.

5. Attendance: Credit will be given for class attendance and deductions will be made (with increasing severity) for classes missed.

Teaching Procedures

Astronomy is a visually appealing science and because I teach most of my classes in an AV-rich environment (the planetarium), I have developed a great deal of support material to enhance my presentations. These include:

1. A personal slide collection in excess of 5,000 transparencies.

2. Five hundred overhead transparencies.

3. An astronomical library approaching 1,000 volumes of research photographic purposes.

4. Thirteen years of successful teaching in a planetarium.

5. Personal experiences and contacts: Travel to Europe, Africa and throughout the United States, specifically for astronomical purposes; construction of telescopes; extensive knowledge of astrophotography and observing techniques; access to dark observing sites, professional observatories, etc.

Examination of the Topic Outline will reveal how I plan to integrate these resources into my teaching procedures. Slides will be utilized to supplement the informational aspects of all presentations. My lessons are highly structured yet flexible enough to allow for student input which is encouraged. I am more concerned with my students' understanding of a concept than in simply communicating all lesson goals. Reexamination of my Course Objectives will further exemplify this student-oriented philosophy.

Textbook(s)

Pasachoff, Jay M. From the Earth to the Universe, 2nd ed., Saunders College Publishing, 1983.

LEHIGH COUNTY COMMUNITY COLLEGE

COURSE OUTLINE

for

AST 201 INTRODUCTORY ASTRONOMY

Date Submitted: March 15, 1985
Clock Hours: 3
Semester Hours: 3
Prerequisite: None

Course Description

INTRODUCTORY ASTRONOMY is a course designed for individuals who have always wanted to explore the universe around them. Topics of discussion will include archaeoastronomy (astronomy of the ancients), eclipses of the sun and moon, a thorough treatment of the solar system, the life and death of stars, as well as instrumentation and techniques of observation. Students will gain familiarity with the night sky through numerous planetarium demonstrations and several observing sessions using telescopes and binoculars. Featured will be observations of Halley's Comet.

Course Objectives

1. To provide students with an accurate up-to-date informational portrait of the science of astronomy.

2. To provide students with the opportunity to become familiar with the many facets of the night sky through planetarium demonstrations and observing sessions utilizing telescopes.

3. To show the validity of the process of science in problem solving situations.

4. To demonstrate the interdisciplinary nature of astronomy as it relates to other branches of science, mathematics and the humanities.

5. To provide the type of classroom atmosphere in which a nonscience-oriented individual feels that he or she has the opportunity to succeed.

Topic Outline

Session 1: Introductory astronomy; A survey of the science of astronomy; Planetarium--seasonal effects from various latitudes; Movie, Universe

Session 2: Archaeoastronomy--focus on ancient Egyptian astronomy and Stonehenge; Planetarium demonstrations; Movie, The Mystery of Stonehenge

Session 3: Eclipses of the sun and the moon; Planetarium demonstrations; Star identification 1

Session 4: Telescopes and their accessories; Demonstration of various types of spectra utilizing a spectroscope; Movies, Journey into Light and Doppler Shift

Session 5: The moon; Observations of the moon through a telescope

Session 6: Hour exam; Introduction to the solar system

Session 7: Mercury, Venus, Earth, Mars; Movie, Mariner 10; Star identification 2

Session 8: Film, Mars the Search Begins; Jupiter, Saturn, Uranus, Neptune, Pluto; Star identification 3

Session 9: Comets, meteors and meteorites; Prospects for viewing Halley's Comet

Session 10: Hour exam; The sun: star of our solar system

Session 11: Nighttime telescopic observing session at South Mountain Preserve of the Lehigh Valley Conservancy

Session 12: Stars and the Hertzsprung-Russell diagram; Star identification 4 and review

Session 13: Star identification quiz; Stellar evolution

Session 14: The Milky Way galaxy and beyond

Session 15: Telescopic observing session at Kutztown University Observatory

Session 16: Final exam; A primer in special relativity

Grading Procedures

A student's final grade will be based upon the number of points accumulated by the individual, divided by the total number of points possible. These will be gleaned from the following criteria:

1. Examinations: There will be two, one-hour tests and a final examination. A sky identification exam will be given in the planetarium. The tests will be objective in nature.

2. Quizzes: Several unannounced quizzes will be administered during the semester. Each quiz will be approximately 15 minutes in duration and consist of questions which will be answered in written form.

3. Written Work: Five short writing exercises will be assigned to help cultivate the ability of students to explain lucidly the content material.

4. Participation: Meaningful participation will be acknowledged through additional credit which could significantly alter a student's grade.

5. Attendance: Credit will be given for class attendance and deductions will be made (with increasing severity) for classes missed.

Teaching Procedures

Astronomy is a visually appealing science and because I teach most of my classes in an AV-rich environment (the planetarium), I have developed a great deal of support material to enhance my presentations. These include:

1. A personal slide collection in excess of 5,000 transparencies.

2. Five hundred overhead transparencies.

3. An astronomical library approaching 1,000 volumes of research photographic purposes.

4. Thirteen years of successful teaching in a planetarium.

5. Personal experiences and contacts: Travel to Europe, Africa and throughout the United States, specifically for astronomical purposes; construction of telescopes; extensive knowledge of astrophotography and observing techniques; access to dark observing sites, professional observatories, etc.

Examination of the Topic Outline will reveal how I plan to integrate these resources into my teaching procedures. Slides will be utilized to supplement the informational aspects of all presentations. My lessons are highly structured yet flexible enough to allow for student input which is encouraged. I am more concerned with my students' understanding of a concept than in simply communicating all lesson goals. Reexamination of my Course Objectives will further exemplify this student-oriented philosophy.

Text

Pasachoff, Jay M. From the Earth to the Universe, 2nd ed., Saunders College Publishing, 1983.

PERM8A-bb

M E M O R A N D U M

Date: March 15, 1985

To: Mr. Mark Polnoroff, Lehigh County Community College

From: Gary A. Becker, Allentown School District Planetarium

Subject: Astronomy Course for LCCC

INTRODUCTION: The following information briefly outlines the basic parameters associated with the proposed Lehigh County Community College--Lehigh Valley Conservancy-sponsored astronomy course to be offered in the fall of 1985.

Course Title:	Introducing Astronomy
Size Limit:	20 students
Credits:	Three, 48 contact hours in 16 sessions
Dates:	To run concurrently with the fall 1985 academic schedule at LCCC
Time:	6:00 to 9:00 p.m., with flexability for observing sessions
Place:	Allentown School District Planetarium located at Dieruff High School /Kutztown University Observatory and Planetarium /Lehigh Valley Conservancy, South Mountain Preserve
Text:	Title: From the Earth to the Universe, 2nd ed. Author: Jay M. Pasachoff Publisher: Saunders College Publishing, 1983
Text Price:	$17.95, paper

DESCRIPTION OF COURSE: INTRODUCING ASTRONOMY is a course designed for individuals who have always wanted to explore the universe around them. Topics of discussion will include archaeoastronomy (astronomy of the ancients), eclipses of the sun and moon, a thorough treatment of the solar system, the life and death of stars, as well as instrumentation and techniques of observation. Students will gain familiarity with the night sky through numerous planetarium demonstrations and several observing sessions using telescopes and binoculars. Featured will be observations of Halley's Comet.

EDUCATIONAL OBJECTIVES:

1. To provide students with an accurate up-to-date informational portrait of the science of astronomy.

2. To provide students with the opportunity to become familiar with the many facets of the night sky through planetarium demonstrations and observing sessions utilizing telescopes.

3. To show the validity of the process of science in problem solving situations.

4. To demonstrate the interdisciplinary nature of astronomy as it relates to other branches of science, mathematics and the humanities.

5. To provide the type of classroom atmosphere in which a nonscience-oriented individual feels that he or she has the opportunity to succeed.

TOPIC OUTLINE

Session 1: Introducing astronomy; A survey of the science of astronomy; Planetarium--seasonal effects from various latitudes; Movie, Universe

Session 2: Archaeoastronomy--focus on ancient Egyptian astronomy and Stonehenge; Planetarium demonstrations; Movie-- The Mystery of Stonehenge

Session 3: Eclipses of the sun and the moon; Planetarium demonstrations; Star identification 1

Session 4: Telescopes and their accessories; Demonstration of various types of spectra utilizing a spectroscope; Movies, Journey into Light and Doppler Shift

Session 5: The moon; Observations of the moon through a telescope

Session 6: Hour exam; Introduction to the solar system

Session 7: Mercury, Venus, Earth, Mars; Movie-- Mariner 10; Star identification 2

Session 8: Film-- Mars the Search Begins; Jupiter, Saturn Uranus, Neptune Pluto; Star identification 3

Session 9: Comets, meteors and meteorites; Prospects for viewing Halley's Comet

Session 10: Hour exam; The sun: star of our solar system

Session 11: Nighttime telescopic observing session at South Mountain Preserve of the Lehigh Valley Conservancy

Session 12: Stars and the Hertzsprung-Russell diagram; Star identification 4 and review

Session 13: Star identification quiz; Stellar evolution

Session 14: The Milky Way galaxy and beyond

Session 15: Telescopic observing session at Kutztown University Observatory

Session 16: Final exam; A primer in special relativity

GRADING PROCEDURE: A Student's final grade will be based upon the number of points accumulated by the individual, divided by the total number of points possible. These will be gleaned from the following criteria:

1. Examinations: There will be two, one hour tests and a final examination. A sky identification exam will be given in the planetarium. The tests will be objective in nature.

2. Quizzes: Several unannounced quizzes will be administered during the semester. Each quiz will be approximately 15 minutes in duration and consist of questions which will be answered in written form.

3. Written Work: Five short writing exercises will be assigned to help cultivate the ability of students to explain lucidly the content material.

4. Participation: Meaningful participation will be acknowledged through additional credit which could significantly alter a student's grade.

5. Attendance: Credit will given for class attendance and deductions will be made (with increasing severity) for classes missed.

TEACHING PROCEDURES: Astronomy is a visually appealing science and because I teach most of my classes in an AV-rich environment (the planetarium), I have developed a great deal of support material to enhance my presentations. These include,

1. A personal slide collection in excess of 5000 transparencies

2. Five hundred overhead transparencies

3. An astronomical library approaching 1000 volumes for research photographic purposes

4. Thirteen years of successful teaching in a planetarium

5. Personal experiences and contacts: Travel to Europe, Africa and throughout the United States, specifically for astronomical purposes; construction of telescopes; extensive knowledge of astrophotography and observing techniques; access to dark observing sites, professional observatories, etc.

Examination of the Topic Outline will reveal how I plan to integrate these resources into my teaching procedures. Slides will be utilized to supplement the informational aspects of all presentations. My lessons are highly structured yet flexible enough to allow for student input which is encouraged. I am more concerned with my students' understanding of a concept than in simply communicating all lesson goals. Reexamination of my Educational Objectives will further exemplify this student-oriented philosophy.

3/14/1985