CHAMINADE UNIVERSITY
PHY-140: INTRODUCTION TO ASTRONOMY
COURSE SYLLABUS – FALL 2010

Instructor: Matthew Cochran
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Office Hours: Monday to Thursday 12:00 to 1:00 or by appointment
Course Time: Monday, Wednesday, and Friday from 11:00 to 11:50
Course Room: Henry Hall 227
Prerequisites: Concurrent enrollment in PHY-140L is assumed.
Required Text: Bennett, Donahue, Schneider, and Voit, *The Essential Cosmic Perspective,* 5th ed., Pearson, New York, 2009.
Other Materials: Scientific Calculator

COURSE DESCRIPTION:

This survey of general astronomy course is intended for students with no previous background in astronomy. The course will emphasize the tools and methods of astronomy, the solar system, the stars, and the structure of the galaxy and the universe. Emphasis is placed on conceptual, as contrasted with mathematical, comprehension.

EVALUATIONS AND GRADING SCALE:

Exam 1	15%
Exam 2	15%
Exam 3	15%
Exam 4	15%
Final	15%
Homework	15%
Presentation	10%

90%	–	100%	A
80%	–	90%	B
70%	–	80%	C
60%	–	70%	D
0%	–	60%	F

Incomplete grades (I) will be given in accordance with college regulations as outlined in the college catalog. Withdrawals (W) from the class are the responsibility of the student and deadlines are set by the college.

EXAMS:
There will be four examinations and a final as part of the requirements for the course. Tests include a combination of short answer formats, multiple choice, figure identification, and short essay formats. Exam questions may be drawn from readings in the textbook, lecture materials (including handouts or other supplements), homework assignments, slides, and in-class activities. Makeup exams will only be given under extenuating circumstances beyond the student's control.

HOMEWORK:
To be successful in this course, it is essential that you complete all homework assignments. Be prepared to spend three hours or more on homework every week. If you are having trouble, get help from the instructor or your classmates. Do not fall behind. Homework is due at the beginning of class. Late homework is not accepted. However, your lowest score will be dropped.

PRESENTATION (more information coming later):
In this course, you are required to be a part of a group that gives a 10 to15 minute presentation. In the presentation, you will apply astronomical principles to address one of the questions from the list below. No two teams can have the exact same question.

<u>Chapter 15 - Galaxies and the Foundation of Modern Cosmology</u>

1. How do we measure the distances to galaxies?
2. What is Hubble's law?
3. How do distance measurements tell us the age of the universe?
4. Why do galaxies differ?
5. What are quasars? What is the power source for quasars and other galactic nuclei? Do massive black holes really exist?

<u>Chapter 16 - Dark Matter, Dark Energy, and the Fate of the Universe</u>

6. What is dark matter and what is the evidence for dark matter in galaxies?
7. What is the evidence for dark matter in galaxy clusters? Does dark matter really exist?
8. What is the fate of the universe?

<u>Chapter 17 - The Beginning of Time</u>

9. What is the evidence for the Big Bang?
10. What aspects of the universe were originally unexplained by the Big Bang model? How does inflation explain these features of the Universe?
11. How can we test the idea of inflation? Why is the darkness of the night sky evidence for the Big Bang?

<u>Chapter 18 - Life in the Universe</u>

12. What are the necessities of life? Could there be life on Mars? Europa or other jovian moons?
13. Are habitable planets likely? Are Earth-like planets rare or common?
14. SETI: How many civilizations are out there?

ATTENDENCE:
Regular attendance is expected of all students. Read material prior to lecture. If a topic is still not clear after it has been discussed in class, ask questions. Time will be spent working through homework problems and reviewing for exams in addition to lecturing. You will work with partners in class. It is important that partners engage in discussion of their work and avoid working as isolated individuals.

STUDENT LEARNING OUTCOMES:
Upon successful completion of the course, the student will be able to:

- Identify and describe all the members of our solar system.
- Identify major stars and constellations.
- Classify stars according to brightness, size, color, and distance.
- Describe the evolution of different kinds of stars.
- State characteristics of various deep sky objects.
- Construct a hierarchy of objects in the observable universe, according to size and distance.

TENTATIVE WEEKLY SCHEDULE:

Week	Date	L#	Topic	Reading	Due	Monday Lab
1	Aug 23	1	Intro;Our Place in the Universe			Lab 1: Position
	Aug 25	2	Scale of the Universe	1.1 to 1.3		
	Aug 27	3	Spaceship Earth	1.1 to 1.3	**HW1**	
2	Aug 30	4	Patterns in the Sky	2.1		Lab 2: Motion
	Sep 01	5	The Seasons	2.2		
	Sep 03	6	The Moon	2.3	**HW2**	
3	Sep 06	**H1**	**Labor Day – No Class**			**Labor Day – No Lab**
	Sep 08	7	The Planets	2.4		
	Sep 10	8	Review		**HW3**	
4	Sep 13	9	**Exam 1 – Chapters 1 & 2**			Lab 3: Seasonal Stars
	Sep 15	10	Ancient Science	3.1 & 3.2		
	Sep 17	11	Copernicus; Nature of Science	3.3 & 3.4		
5	Sep 20	12	Describing Motion	4.1 & 4.2		Lab 4: The Ecliptic
	Sep 22	13	Conservation Laws; Gravity	4.3 & 4.4		
	Sep 24	14	Light	5.1	**HW4**	
6	Sep 27	15	Spectra	5.2		Lab 5: Atomic Fingerprints
	Sep 29	16	Telescopes	5.3		
	Oct 01	17	Review		**HW5**	
7	Oct 04	18	**Exam 2 – Chapters 3 to 5**			Lab 6: The Parsec
	Oct 06	19	Our Solar System	6.1 to 6.3		
	Oct 08	20	Formation of Planets	6.4 & 6.5		
8	Oct 11	**H2**	**Discoverer's Day – No Class**			**Discoverer's Day – No Lab**
	Oct 13	21	Terrestrial Worlds	7.1 & 7.2		
	Oct 15	22	Terrestrial Worlds	7.3 to 7.5	**HW6**	
9	Oct 18	23	Jovian	8.1 to 8.3		Lab 7: The Cause of Moon Phases
	Oct 20	24	Jovian; Asteroids	9.1 & 9.2		
	Oct 22	25	Comets	9.3 & 9.4	**HW7**	
10	Oct 25	26	**Exam 3 – Chapters 6 to 9**			Lab 8: Predicting Moon Phases
	Oct 27	27	Sun; Fusion in the Sun	10.1 & 10.2		
	Oct 29	28	The Sun-Earth Connection	10.3		
11	Nov 01	29	Luminosities	11.1		Lab 9:Apparent and Absolute Magnitudes of Stars
	Nov 03	30	Patterns Among Stars	11.2		
	Nov 05	31	Star Clusters	11.3	**HW8**	
12	Nov 08	32	Star Birth; Low-Mass Stars	12.1 & 12.2		Lab 10: HR Diagrams
	Nov 10	33	High-Mass Stars	12.3		
	Nov 12	34	The Stellar Graveyard	13.1 to 13.4	**HW9**	
13	Nov 15	35	**Exam 4 – Chapters 10 to 13**			Lab 11: Milky Way Scales
	Nov 17	36	Milky Way	14.1 & 14.2		
	Nov 19	37	History of the Milky Way	14.3 & 14.4		
14	Nov 22	38	Galaxies	15.1 & 15.2		Lab 12: Galaxy Classification
	Nov 24	39	Galaxy Evolution	15.3 & 15.4	**HW10**	
	Nov 26	**H3**	**Thanksgiving – No Class**			
15	Nov 29	40	Presentations			Presentations
	Dec 01	41	Presentations			
	Dec 03	42	Review			
Finals	Dec 08	**FE**	**10:30 to 12:30 – FINAL EXAM – Cumulative**			