

LECTURE SCHEDULE

[NOTE: this is just the Lecture Schedule. Please see the Syllabus in the ASTR 320 Handbook for full details about this class. The Handbook is found on the D2L site for this class.]

This course has been divided into 5 themes, each theme covering one general topic and one historical time period. During each of these periods we will discuss the view of the universe of people living in that period, and how they came to believe in that view. Finally, we will discuss the effect that view had on their lives and their times.

- THEME #1: SCIENTIFIC TRUTH:**
Weeks 1-2 What does the sky look like? What is our place in it?
How do we know what to believe?
- THEME #2: THE OLD VIEW:**
Weeks 3-5 Astronomy and society- Greeks, Romans, Christians, Moslems
- THEME #3: THE NEW VIEW:**
Weeks 6-9 The Scientific Revolution from Copernicus to Enlightenment
- THEME #4: THE MODERN VIEW:**
Weeks 10-14 Astronomy from Newton to Hubble
- THEME #5: LINGERING QUESTIONS:**
Weeks 15-16 Life, Religion, God, Meaning

THEME #	WEEKS	LECTURE NOS.	TEXTBOOK READINGS [Hoskin]	HANDBOOK READINGS [Chriss]
# 1	1 - 2	1 - 4	pp. 1 - 17	1.1 - 4
# 2	3 - 5	5 - 9	pp. 18 - 67	5.1 - 9.2
# 3	6 - 9	10 - 16	pp. 68 - 167	10.1 - 16.3
# 4	10 - 14	17 - 25	pp.168 - 319	17 - 25.8
# 5	15 - 16	26 - 27	pp.320 - 330	26.1 - 27.6

LECTURE SCHEDULE

ASTRONOMY 320
University of Arizona

Philosophy and History of Astronomical Thought

PROF. MICHAEL CHRISS
Spring 2015

DATE	LEC.#	LECTURE	TOPICS	READINGS
------	-------	---------	--------	----------

THEME #1: SCIENTIFIC TRUTH:
 What does the sky look like? What is our place in it?
 How do we know what to believe?

PREHISTORY: THE ROOTS OF ASTRONOMY (prior to 500 BC)

INTRODUCTION TO HISTORY OF ASTRONOMY

Theme: The Cosmic Quest- the search to find our meaning in the universe begins with the search to find our place in the universe.

Th Jan15	L 1	"CLOSED WORLD TO INFINITE UNIVERSE" - course introduction and overview	INTRO.	(H)=Handbook (T)=Textbook (H)1.1 - 1.8
Tu Jan20	L 2	"WHAT IS TRUTH?" - the philosophical foundations of the scientific view	SCI. METHOD	(H)2.1 - 2.4

THE SKY ABOVE AND THE EARTH BELOW

Theme: The starry vault of night becomes the inspiration of ancient culture's attentions and religions.

Th Jan22	L 3	"THE BOWL OF NIGHT" - motions in the sky	BASIC SKY	(H)3.1 - 3.2 (T)pp.1-24
Tu Jan27	L 4	"SKYWATCHERS OF THE ANCIENT WORLD" - archeoastronomy: Egypt to Medicine Wheel	ARCHEOASTRON.	(T)pp.1-24

THEME #2: THE OLD VIEW:
 Astronomy and Society- Greeks, Romans, Christians, Moslems

CHAOS TO COSMOS: GREEKS, ROMANS, CHRISTIANS, MOSLEMS: (500 BC to 1000 AD)

THE FOUNTAINHEAD

Theme: The philosophers of classical Greece find a geometrical logic and design to the structure of the heavens, and man's place in it.

Th Jan29	L 5	"THE MUSIC OF THE SPHERES" - early Greek astronomy: Ionia to Pythagoreans	IONIANIANS & PYTHAGOREANS	(H)5.1 - 5.2 (T)pp.24-33
Tu Feb 3	L 6	"THE LOGIC OF THE HEAVENS" - the Socratic philosophers	SOCRATICS	(T)pp.24-33

THE COSMIC GEOMETRY

Theme: Later Greek philosophers perfect the geocentric model of the universe, and Greek art and architecture embodies this grand cosmic design.

Th Feb 5	L 7	"WHEELS ON WHEELS" - the Hellenistic astronomers	PTOLEMY	(T)pp.33-49
Tu Feb10	L 8	"IDEALS AND PERFECTION" - the Greek ideal of a cosmic art and architecture	GREEK ART	(H) 8

MICROCOSM AND MACROCOSM

Theme: The Greek cosmic model forms the basis for Roman Empire society model, and is adapted by the Christians as God's divine plan.

Th Feb12	L 9	"EMPEROR, GOD, AND COSMOS" - Romans, Christians, Moslems & cosmology	COSMOS, RULERS AND RELIGIONS	(H) 9.1 - 9.2 (T) pp.50-67
Tu Feb17	Exam	EXAM #1: Lectures 1-9	EXAM #1	

THEME #3: THE NEW VIEW:
 The Scientific Revolution from Copernicus to Enlightenment

THE REBIRTH OF THINKING: THE RENAISSANCE (1200 to 1500 AD)

NEW HORIZONS FOR MAN

Theme: The paradigm shifts. The Renaissance brings new horizons and new viewpoints for man, on earth and in heaven. The old world ends; a new world begins.

Th Feb19	L 10	"NEW VIEWS OF HEAVEN AND EARTH" - the visions of Luther and Columbus	REFORMATION	(H) 10.1 - 10.3
Tu Feb24	L 11	"THE NEW PERSPECTIVE" - Renaissance Art and Humanism	REN. ART	(H) 11 (T) pp.68-86

THE SCIENTIFIC REVOLUTION: THE SHATTERING OF THE CRYSTAL SPHERES (1500 to 1700 AD)

THE BIRTH OF A NEW WORLD VIEW

Theme: A new model of the universe takes shape as Copernicus removes the earth from the center and Kepler discovers the mathematics of planetary motion.

Th Feb26	L 12	"THE EARTH MOVES!" - Copernicus and a new model of the universe	COPERNICUS	(T) pp.80-93
Tu Mar 3	L 13	"A MATHEMATICAL UNIVERSE" - Brahe, Kepler and the mathematics of the cosmos	BRAHE+KEPLER	(H) 13 (T) pp.94-111

THE CLASH OF SCIENCE AND RELIGION

Theme: Galileo observes the heavens with a telescope and finds new evidence for the Copernican Theory. He tried by the Inquisition for heresy. The science scene shifts to England, where Newton unites the physics of heaven and earth.

Th Mar 5	L 14	"THE CRIME OF GALILEO" - Galileo, the Pope, and the battle for men's minds	GALILEO	(H) 14.1 - 14.2 (T) pp.111-129
Tu Mar10	L 15	"THE MARRIAGE OF HEAVEN AND EARTH" - Newton, Halley, physics of the universe		(T) pp.130-150
Th Mar12	L 16	"THE CLOCKWORK UNIVERSE" - fate and free Will	CLOCKWORK UNIV.	(H) 16.1 - 16.3 (T) pp.130-150

XXXXXXXXXXXXXXXXXXXXXXXXXXXX<<<<< *spring break* >>>>>XX

THEME #4: MODERN TIMES:
 Astronomy from Newton to Hubble

THE POST-NEWTONIAN AGE: THE GROWTH OF THE SCIENTIFIC WORLD VIEW (1700 to 1900 AD) (

THE MECHANIZATION OF THE WORLD PICTURE

Theme: The scientific method takes form and transforms the world view. The Enlightenment.

Tu Mar24	L 17	"SCIENTISTS, ARTISTS, REVOLUTIONS - science societies, art, politics	THE ENLIGHTENMENT	(H) 17
Th Mar26	Exam	EXAM #2: Lectures 10-16	EXAM #2	



MON. APRIL 6th 7:30P: STEWARD OBSERVATORY MONDAY LECTURE: "THE CRIME OF GALILEO"

Tu Mar31	libr.	RARE BOOKS COLLECTION (meet at library)	GREAT BOOKS of SCI.REVOL.
----------	-------	---	------------------------------

THE 18th and 19th CENTURY: A VISION OF AN INFINITE UNIVERSE (1700 to 1900 AD)

EXPANDING HORIZONS AND THE PLACE OF MAN

Theme: 18th and 19th century astronomers sweep the skies and discover new worlds around the sun and others suns that form our galaxy: the Milky Way.

Th Apr 2	L 18	"THE MEASURE OF THE EARTH" - the voyages of discovery and the longitude prob.	VOY. OF DISC. LONGITUDE	(H)18.1 - 18.2
Tu Apr 7	L 19	"THE FAMILY OF THE SUN" - the discovery of the solar system from Vulcan to Mars	SOLAR SYSTEM	(T)pp.150-154
Th Apr 9	L 20	"THE FAMILY OF THE SUN" - the discovery of the solar system from Uranus to Pluto	SOLAR SYSTEM	(T)pp.154-167
Tu Apr14	L 21	"THE COSMIC PINWHEEL" - the discovery of our galaxy, from Herschel to Shapley	MILKY WAY	(H)21 (T)pp.168-218
Th Apr16	L 22	"THE COSMIC PINWHEEL" - the discovery of our galaxy, from to Shapley to Baade	POP I & II	(T)pp.218-286

THE 20th CENTURY: BRAVE NEW MAN IN A BRAVE NEW UNIVERSE (1900 to 2000 AD)

WORLDS WITHOUT END

Theme: In the 20th century the astronomers discover an endless universe of galaxies, explore the life of the stars and question whether we are alone.

Tu Apr21	L 23	"HUBBLE'S UNIVERSE"- The great telescopes and the discovery of the galaxies	HUBBLE GREAT TELESCOPES	
Th Apr23	L 24	"THE GREAT DEBATE & THE SEARCH FOR THE YEAR 0" - superclusters and H ₀	HUBBLE CONST.	(T)pp.286-305
Tu Apr28	L 25	"A JOURNEY TO OZ" - stellar evolution and the search for life in the universe	STELLAR EVOL; OZMA	(H)25.1 - 25.8

THEME #5: LINGERING QUESTIONS:
Life, Religion, God, Meaning

THE 21st CENTURY: QUO VADIS MANKIND? BEGINNINGS AND ENDINGS (1900 to present)

MODERN MAN AND THE SEARCH FOR MEANING

Theme: As the 20th century ends, astronomy, philosophy and theology appear to be asking the same kinds of questions.

Th Apr30	L 26	"EINSTEIN AND RELATIVITY" - 4 dimensions and the shape of space	EINSTEIN	(H)26.1 - 26.4 (T)pp.306-320
Tu May 5	L 27	"MAN, GODS, MEANING" - universe, multi-verse, noosphere	COSMOLOGY	(H) 27.1 - 27.6 (T)pp.320-330

Exam #3: Lectures 17-27 (given during the Final Exam period)

SPRING BREAK: Mar 15-21
 LAST LECTURE: May 5 (Tue)
 FINAL EXAM: May 11 (Mon) 1-3p