

Mid-America Christian University - Spring 2009 NATS 2603: Introduction to Astronomy- Online

Instructor Contact Information:

- **Instructor Name:** John Ensworth
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- **Course Schedule:** “Sundays” May 10 to Jun 14
(Daily feedback/help available except Sundays.)
- **Class web page:** http://www.bikerjohn.com/classes/mac_u_ast/
(or go to the Links page from www.bikerjohn.com)

Course Information:

- **Course Description** This is a 3 credit-hour college course designed to introduce students to the field of astronomy and to basic science concepts. A broad range of topics will be discussed to provide the student with an appreciation for the many areas of study that must be undertaken to gain a full understanding of the world around us, and the universe at large. These topics include time, seasons and tides, the solar system, sun and their formation, the effect on our weather and climate, our galaxy and the large scale structure of the universe in time and space. Observational techniques and equipment in astronomy will be covered with an emphasis on telescopes and equipment for beginners. Basic concepts will be stressed. The biggest and smallest objects in the universe will be covered (and the biggest questions as well). No prerequisite math or science courses will be assumed.

Course Objectives: To understand more and really enjoy the universe since it is the very fingerprint of God/Jesus.

Psm 19:1-2 The heavens declare the glory of God; the skies proclaim the work of his hands. Day after day they pour forth speech; night after night they display knowledge.

- **Prerequisites:** This is an introductory course in astronomy. There are no mathematical prerequisites, but you should be comfortable with Internet research and have good writing skills.
- **Specific Course Requirements** none specific.

Textbooks, Supplementary Materials, Software Requirements:

- **Required Textbook:** Horizons- Exploring the Universe, 10th Ed., Michael A. Seeds, 2007 Brooks/Cole Thomson Learning,
 - **ISBN-10:** 0495119636
 - **ISBN-13:** 978-0495119630 \$120 new/\$85 used (amazon.com)
- **Supplementary Materials:** A planisphere - so you may go outside and work on learning the sky. You may download ‘still’ images of the sky for free from the Internet (see the class Website and the Astronomy Links - Sky Maps).

- **Software requirements:** *Microsoft Office, Java, and Internet Explorer.*
(Any questions, contact Tiffany Clary).

Assessment and Grading:

- **Testing Procedures** One ‘take home’ short answer final exam.
- **Course Content & Grading:** Because exams are not feasible the nature of the online environment, the majority (80%) of the student’s grade will be determined by reading based questions and a couple of papers.

(All work is due at the end of the week it is assigned.)

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|---------------------------------------|-----|
| Week 1 Text Questions (due week 2) | 10% |
| Week 2 Text Questions (due week 3) | 10% |
| Week 3 Text Questions (due week 4) | 10% |
| Week 4 Text Questions (due week 5) | 10% |
| Week 2 Paper (due Week 3) | 15% |
| Class Paper Week 4 (due Week 5) | 15% |
| Final Exam -10 short answer questions | 20% |
- Class Participation (ask me lots of questions!!!) 10%
(Class Participation = Attend some of the Live Chats (or schedule one on your terms) or send me questions on the science via the WebCT mail tool).
 - **Grading Scale:** 90-100 A; 80-89 B; 70-79 C; 60-69 D; 59 or less F.

Topics and Weekly ASSIGNMENTS AND PARTICIPATION

Week 1 The Sky and the Science of Astronomy

- How big is the universe?
- What is the sky like at night, and how do I find my way around it?
- How do things move through the sky?
- Where does modern astronomy come from?

These questions at the start of each week are just the overall concepts you'll learn in this section. (Don't answer them as homework!)

We know that Job is the oldest book in the Bible and makes many mentions of the stars and constellations including Orion, the Pleiades and the star Arcturus plus 'Mazzaroth' = the Zodiac constellations as a whole.

Job 38:31-33 Can you bind the chains of [the clusters of stars called] Pleiades, or loose the cords of [the constellation] Orion? Can you lead forth the signs of the zodiac in their season? Or can you guide [the stars of] the Bear with her young? Do you know the ordinances [laws] of the heavens? Can you establish their rule upon the earth?

God assigned His own names to the stars : Psm 147:4 He determines and counts the number of the stars; He calls them all by their names.

Arabic tradition states that Seth (Adam's grandson) and Enoch named the constellations.

Gen 1:14-16 (stars) ... let them be for signs, and for seasons, and for days and years

Reading: Chapters 1-4

Text Questions (Try to limit answers to one paragraph each.)

Ch 1, Pg 9: #2,3,5,6,9 Extra Credit (one problem worth): Problem 5

Ch 2, Pg 21: #1,5,6,11,16 Extra Credit (one problem worth): Problem 5

Ch 3, Pg 42: #1,3,4,6,8 Extra Credit (one problem worth): Problem 5

Ch 4, Pg 71: #3,6,10,12 Extra Credit (one problem worth): Problem 1

Note! The Questions are different from the Problems. The Problems section is more difficult and is only for extra credit in this course.

Week 2 Nature of the Planets

- What is the origin of the solar system?
- Why is the surface and structure of the planet Earth the way it is?
- What's different and similar between the planets in the solar system?
- What are terrestrial planets and outer (Jovian) planets?
- What are meteors, asteroids and comets?

Reading: Chapters 16-19

Text Questions (Try to limit answers to one paragraph each.)

Ch 16, Pg 369: #1,2,4,6,8,15 Extra Credit (one problem worth): Problem 9

Ch 17, Pg 405: #1,3,5,9,14,15 Extra Credit (one problem worth): Problem 1

Ch 18, Pg 436: #1,5,10,11,14 Extra Credit (one problem worth): Problem 9

Ch 19, Pg 454: #5,6,13,15 Extra Credit (one problem worth): Problem 1

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Week 2 Paper (due week 3)

Prepare a 1050-1400-word paper that answers the following questions:

Is Pluto a planet? What do scientists say about Pluto and why?

What bodies in the solar system have been called planets in history?

What do you think astronomers should do about Pluto and new planetary-type bodies discovered in the solar system?

Week 3 *Light, Telescopes, the Sun and Stars*

- What are telescopes? How do they work? Are there different kinds?
- What is the nature and importance of light and other electromagnetic waves?
- What is the sun? (Our own star.)
- What are other stars like?
- What is the life cycle of stars?
- How do stars die? How will the sun die?
- What are white dwarfs, neutron stars and black holes?

Reading: Chapters 5-11

Ch 5, Pg 97: #2,3,4,13,15 Extra Credit (one problem worth): Problem 3

Ch 6, Pg 116-7: #1,2,6,8,14 Extra Credit (one problem worth): Problem 1

Ch 7, Pg 140: #1,7,10,15 Extra Credit (one problem worth): Problem 6 (use $E=mc^2$)

Ch 8, Pg 167: #1,5,9,12,14 Extra Credit (one problem worth): Problem 1

Ch 9, Pg 195: #1,4,10,13 Extra Credit (one problem worth): Problem 5

Ch 10, Pg 222-3: #1,3,9,15 Extra Credit (one problem worth): Problem 2

Ch 11, Pg 247: #2,4,8,12,14 Extra Credit (one problem worth): Problem 2

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Week 3 **Final Class Paper: (due week 5)**

Prepare a 2,100 to 2,450-word paper and PowerPoint presentation with notes on each slide (based on the paper you write) that answers any one of following questions. You may also

submit your own desired area of research to John Ensworth for approval (if you don't like any of the ideas below).

Is time travel possible?

Is Astrology Real?

What was the Star of Wonder that led the wise men to the manger?

Is there evidence that the sun stood still once in history?

Does the full moon make people loony? Are there more babies or crimes (911 calls) on full moon nights?

History of the telescope

What do we know about other solar systems?

What will it take to get a human colony on the Moon? or Mars?

Life on Jupiter's Moon Europa? Saturn's Moon Enceladus?

The astronomy (good or bad) behind the sci-fi movie/TV show "fill in the blank"

The planet of your choice

New Planets in the Solar System

Mega-solar storms - what has happened, what could happen?

Planetariums in history, in the present, and the future?

The Beginning of the Universe - Explorations of the Cosmic Background Radiation -

The End of the Universe? Scientific vs. Creation vs. Intelligent Design?

What is the state of the Unification of the Forces?

What is Dark Energy? Dark Matter?

How may the Universe End?

What are the job prospects in Astronomy?

What is the economics of astronomy...who pays and how much and for what?

What is the history of ...the telescope?...space exploration?...space borne observation platforms?

What alternatives to the Big Bang exist?

What are Black Holes? What would it be like falling into one?

...or whatever else you like!

Week 4 The Large Scale Universe

- Our galaxy- the Milky Way. What is it?
- What are galaxies in general? How do they differ?
- What are active galaxies and why do they warrant a chapter to their own?
- What is cosmology? How big is big in the universe and how is it all set up?

John 1:1-3 1In the beginning was the Word, and the Word was with God, and the Word was God. 2He was with God in the beginning. 3Through him all things were made; without him nothing was made that has been made.

God/Jesus set the sky in place: Gen 1:14-16 And God said, Let there be lights in the expanse of the heavens and separate the day from the night, and let them be signs and tokens [of God's provident care], and [to mark] seasons, days, and years. (Gen 8:22)

Rom 1:20-23 For ever since the creation of the world His invisible nature and attributes, that is, His eternal power and divinity, have been made intelligible and clearly discernible in and through the things that have been made (His handiworks). So [men] are without excuse [altogether without any defense or justification], because when they knew and recognized Him as God, they did not honor and glorify Him as God or give Him thanks. But instead they

became futile and godless in their thinking [with vain imaginings, foolish reasoning, and stupid speculations] and their senseless minds were darkened. Claiming to be wise, they became fools [professing to be smart, they made simpletons of themselves]. And by them the glory and majesty and excellence of the immortal God were exchanged for and represented by images, resembling mortal man and birds and beasts and reptiles.

Reading: Chapters 12-15

Ch 12, Pg 274-5: #1,3,6,9,11,14 Extra Credit (one problem worth): Problem 1

Ch 13, Pg 298-9: #1,13,15,17 Extra Credit (one problem worth): Problem 1

Ch 14, Pg 318-9: #9,10,11,14 Extra Credit (one problem worth): Problem 8

Ch 15, Pg 344-5: #1,2,4,11,12,14 Extra Credit (one problem worth): Problem 1

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Week 5 Extraterrestrial Life/Astronomy Research

- What is life on Earth like?
- Might there be life elsewhere in the solar system?
- What kinds of stars might also harbor life?
- How is searching for life elsewhere in the universe and how?
- What if I want to be an astronomer? What are the job prospects?

Reading: Chapter 20

Final Exam: 10 short answer questions. Exam will be available via email and on the class Website and WebCT.

Text Questions (Try to limit answers to one paragraph each.)

Ch 20, Pg 472-473: #1,2,5,6,9,10,11 Extra Credit (one problem worth): Problem 1

Note! The Questions are different from the Problems. The Problems section is more difficult and is only for extra credit in this course.

Policies and Procedures

Papers will be graded using the included rubric:

<i>Science Content</i>	50%
<i>Writing Flow/Readability/Appearance (see APA guidelines or similar)</i>	20%
<i>Correct Length (not relying heavily on large chunks of quoted material)</i>	10%
<i>Spelling/Grammar</i>	10%
<i>Citations/Bibliography (+correct format)</i>	10%

Late assignments

ASSIGNMENTS ARE DUE ON THE DAY THEY ARE DUE. A 10% penalty per week, beginning the week after the assignment is due, will be assessed for all late work. That is, I will score the paper and then deduct 10% of the total from that score. The assignment of an A in cases of late work will be rare (for all practical purposes, impossible), as timeliness is a requisite in defining excellence.

Course Ground Rules:

- Participation is required.
- Expected to communicate with other students in discussion threads.
- Learn how to navigate in WebCT.
- Keep abreast of course announcements.
- Use the assigned university email address as opposed to a personal email address.
- Address technical problems immediately contact Tech Support: bdu@macu.edu or call 405 – 692-3245.
- Observe course netiquette at all times.
- Punctuality: All assignments are due each week. Grade deductions can be expected for late assignments.

Guidelines for Communications:

- **Email:** Always include a subject lines. Remember that without facial expressions some comments may be taken the wrong way. Be careful in wording your emails. Use of emoticons might be helpful in some cases. Use standard fonts. Do not send large attachments without permission. Special formatting such as centering, audio messages, tables, html, etc., should be avoided unless necessary to complete an assignment or other communication.
- **Assignments:** Use Microsoft's Word. Font should be 12 point, margins should be 1" (upper, lower, left, right), student's name, course number, and date must appear at the top of each page of the assignments of each assignment and the final exam.
- **Discussion Groups:** Review the discussion threads thoroughly before entering the discussion. Be a lurker then a discussant. Try to maintain threads by using

the “Reply” button rather than starting a new topic. Do not make insulting or inflammatory statements to other members of the discussion group. Be respectful of other’s ideas.

Be patient and read the comments of other group members thoroughly before entering your remarks. Be positive and constructive. Respond in a thoughtful and timely manner.

- **Chat:** Normally, chat is not required for a course with the exception of the first module. Students may voluntarily use chat for study groups or to confer with their instructor. If you are using chat, introduce yourself to the other students in the chat session. Be polite. Choose your words carefully. Do not use derogatory statements. Be concise in responding to others in the chat session. Be constructive in your comments and suggestions.

Library:

- The Mid-American Christian University Library Website includes links and services for: an online catalog, basic library information, Help, electronic resources, distance education library services, citation help, and periodicals.

Syllabus Changes:

- Any necessary changes to the course syllabus will be sent to the student by email and posted on the bulletin board.

Technical Support: Use the technical support link provided.

ADA Compliance: Disability Services

Estimated times of completion for graduate programs at MACU do not include necessary accommodations for students with disabilities as defined by federal regulation. Students who claim a learning or physical disability must self-identify and provide documentation of their disability prior to admission to the program if they knew or should have known of their disability.

Documentation provided to the University of any disability must be less than three years old and must contain specific recommendations for accommodation appropriate to the diagnosed disability. Documentation must be provided by a licensed professional in the area of the claimed disability. Based on such documentation, in consultation with the graduate office of MACU, the student will be advised of any program modifications necessary to complete the compressed format of the graduate curriculum.

If discovery of disability occurs after enrollment, the student will be referred by the course instructor to the graduate office for assessment and recommendation. For further information refer to the MACU Catalog.

Academic Standards

The academic standards for students follow the published guidelines in the MACU catalog unless otherwise noted in this handbook.

Guidelines for Academic Integrity

Mid-America Christian University seeks to support and promote qualities of academic honesty and personal integrity. Serious offenses against the university community include cheating, plagiarism, and all forms of academic dishonesty. Any student who knowingly assists another student in dishonest behavior is equally responsible.

Academic violations and dishonesty is defined as the deception of others about one's own work or about the work of another. Examples of academic violations include, but are not limited to:

1. Submitting another's work as one's own or allowing another to submit one's work as though it were his or hers.
2. Failure to properly acknowledge authorities quoted, cited or consulted in the preparation of written work (plagiarism).
3. The use of a textbook or notes during an examination without permission of the instructor.
4. The receiving or giving of unauthorized help on assignments.
5. Tampering with experimental data to obtain a "desired" result or creating results for experiments not done.
6. Tampering with or destroying the work of others.
7. Submitting substantial portions of the same academic work for credit or honors more than once without permission of the present instructor.
8. Lying about academic matters.
9. Falsifying college records, forms or other documents.
10. Unauthorized access of computer systems or files.
11. Violating copyright of any form of media.

Students who are guilty of academic violations can expect to be penalized. An instructor whose definition of cheating may differ from that stated above has the responsibility and obligation to so inform the students, in writing, at the beginning of the course. Those instructors who fail to do so have no basis for disciplinary action instances of purported student dishonesty outside of the above provisions.

The course instructor shall have the authority to deal with instances of academic dishonesty within the following guidelines:

1. Courses of action may include, but are not limited to, the following:
 - a. Work may not be redone and no credit will be given for that specific assignment.
 - b. The student may receive a failing grade for the course.
 - c. Work may be redone for partial credit.
 - d. Alternate assignments may be given for partial credit.

2. Faculty members must report any incident of violation of the policy on academic integrity to the Director the program and Dean of Adult and Graduate Studies.

Upon the second report against a particular student, action will be initiated under provisions of the judicial code and may lead to dismissal of the student from the university.

The student has the right to appeal action under this policy through the regular channels as established by the grade appeals process.

Instructor Bio

John Ensworth

I am currently the Senior Science Education Specialist at the Institute for Global Environmental Strategies which is a non-profit organization formed (among other things) to conduct independent reviews on all Earth and space science education products produced by or for NASA. (www.strategies.org) My position is the one responsible for directly conducting these reviews and monthly online workshops for NASA and at the large education conferences (i.e. NSTA, NCTM) that introduce the products that pass on the criteria of scientific accuracy and classroom usability.

For the last decade I was a masters student and a PhD candidate in meteorology at the University of Oklahoma. I have earned undergraduate degrees in physics, astronomy, geography and meteorology with minors in math and computer science.

I became interested in astronomy in the 2nd grade and began to teach astronomy to cub scouts and boy scouts by the 5th grade. I began to work for the Arizona State University planetarium when Halley's Comet paid the inner solar system a visit in 1985-1986 and taught the astronomy labs, became head TA and eventually taught an astronomy class through the rest of the 80's (as an undergraduate). I have worked an internship at Steward Observatory, at the University of Arizona, Tucson, site testing for the placement of the Mt. Graham observatory complex. I've also observed at the 4-meter telescope at Kitt Peak, a 36" telescope at Kitt Peak, and at the Multi-Mirror Telescope at Mt. Whipple.

More recently, I've successfully run 43 astronomy nights for Norman residents and OU students and have worked at the Oklahoma City Omniplex Planetarium for 8 years. I've taught astronomy for the college degree completion program at Mid-America Christian University (formerly Mid-America Bible College) for the last 3 years and am a member of the Oklahoma City Astronomy Club. I have also served an internship at NASA Goddard Space Flight Center.

I was saved in the winter of 1991 in Oklahoma (on a flight back from Christmas break) and have been a house church pastor (late 1990's in Oklahoma) and am currently a Kinship pastor in Northern Virginia.