

# Introduction to Astronomy

## Mount San Antonio College Course Syllabus & Outline – Winter 2018



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Office Hours: 60-1102	TWR: 1:30-2	<i>or by appointment</i>
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Class Meets: TWR, 7:30-10:20 in 11-2119

Class Web Page: <http://faculty.mtsac.edu/mboryta/astr5.html>

**COURSE DESCRIPTION:** This class will cover the history of astronomy, telescopes, the Sun, the Solar System, stars, galaxies, galaxy clusters, dark matter, dark energy, the beginning and end of the Universe, and recent discoveries. Since there's a limited amount of time in the semester, I will have to pick and choose among the topics to cover in detail, so if you have something you're especially interested in, let me know! Participation in a Field Trip is **required**.

**TEXT:** Palen, Kay, Smith, and Blumenthal, 2015, Understanding Our Universe (2/e).

**PREREQUISITE:** Eligibility for ENGL1A. Be advised: students who have *passed* ENGL1A and MATH51 have reported feeling more confident and comfortable with the concepts and material presented in this course.

**FORMAT:** Class will consist of group discussions, in-class activities and lectures; multimedia presentations, videos and overheads will aid visualization; observation projects. Study Guides and some assignments will be on the Internet.

**COURSE MEASURABLE OBJECTIVES:** After taking this course, students should be able to:

1. Identify and explain the basic motion of the planets.
2. Compare the three motions of the earth.
3. Relate the major structures of the universe to specific units of measurement.
4. Explain the motion and phases of the Moon, as well as the mechanism of eclipses.
5. Classify types of electromagnetic radiation.
6. Summarize and evaluate current theories of the origin and evolution of the solar system.
7. Classify and identify meteorites based on their visual properties.
8. Explain stellar evolution.
9. Summarize and evaluate our current understanding of cosmology.

**GENERAL INFORMATION:** For thousands of years, humans have stood in awe of The Wanderers. We live at a time of uniquely rich exploration of our solar system, yet few people know the present state of knowledge, how our understanding has been acquired, or why it is important to us. Questions pertaining to the subject matter are strongly encouraged – no, **requested!** - at any time, in class or by e-mail (lengthy discussions or questions about material beyond the scope of this class may need to be postponed/resumed at another time).

**COURSE REQUIREMENTS:** I assume that you have made the choice to sign up for this class because *you want to learn* about your place in the Solar System. In order to take full advantage of your educational opportunity, here are some things you can do and skills you should have or work on:

1. First, if this class seems difficult for you, seek help from me AS SOON AS YOU CAN. **I am here to help!**
2. **Come to each and every class, on time;**
3. **READ AND UNDERSTAND the assignments prior to coming to class.** Don't just read it! ("College level rigor" is defined as a *minimum of three hours of work per week per unit of credit*, including class time);
4. **TAKE PART IN CLASS!** This class is for YOU, so try to answer and ask questions!
5. **Take good notes** on the important concepts as you read and as you pay attention in class; if you've read the text ahead of time, you'll know how to spell new words and you won't have to write everything down! It may help you to **rewrite your notes** after each class;

6. **STUDY the illustrations!** "A picture is worth a thousand words" applies to your textbook;
  7. **Attempt the review questions** and be familiar with the Key Terms for each chapter;
  8. **Start studying now** for the next exam! The best ways to do that are to
    - a) form and work with a study group, and
    - b) make use of the study guide on the class website (see above).
  9. Finally, if this class seems difficult for you, seek help from me AS SOON AS YOU CAN. **I am here to help!**
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**ASSESSMENT:** Your grade will be based on your **understanding** of course material as assessed by (nearly) weekly quizzes, activities including observation projects, in-class presentation, exams, and participation in a field trip. Extra credit exercises *may* be offered at various times throughout the semester, but these will NOT make up for otherwise poor performance!

**QUIZZES:** About every **DAY, STARTING TOMORROW** there will be a short multiple-choice quiz during class. These will *not* be announced; **no makeup quizzes will be given**. You will need a #2 pencil and **SCANTRON Card** (Form #815-E) to complete each quiz. Each quiz will be worth 10 points, and will cover material since the last quiz.

**ACTIVITIES:** There will be various in-class activities throughout the semester; these will be worth various points. Activities will include such things as a lunar Observation project, presentations and reports. More information will come separately...

**EXAMS:** There will be FIVE exams, including a COMPREHENSIVE FINAL EXAM. These involve some combination of multiple-choice, true/false, and short answer/essay. For these you will need to bring a **calculator**, a **#2 pencil** and a **SCANTRON Card** (Form 882). Exam dates are noted on the Outline; those dates will NOT change, but the exam content will reflect class progress. Their value will be dependent on what is covered; the first four usually have point values of about 100, while the Final is worth about 200.

If you **must** miss *one* exam (**NOT INCLUDING THE FINAL – don't miss that!!**) for a verifiable medical emergency or death (*CHECK WITH ME*), you **may** be able to make it up for fewer points before it is handed back to the class. Legitimate excuses MUST be verified; "I had a cold," "I overslept" or "I couldn't get a ride" don't qualify!

**FIELD TRIP:** Participation in a field trip is required; there may be several choices, for which details will be available later. You can earn up to 50 points for **actively participating** in a field trip and **turning in** the assignment that's given, but **if you do not fulfill the field trip requirement, you will get an "F" in the class!**

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**ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES:** If you have special needs, please let me know as soon as possible so that I may assist you to be successful in this class. MtSAC will make reasonable environmental and academic adaptations that promote students' access and equitable participation. Students whose condition, either permanent or temporary, that may be impacted by environmental and/or academic barriers are strongly encouraged to approach their faculty and the disability office at the beginning of the term to discuss possible adaptations. DSP&S (Disabled Student Programs & Services) is located in the Student Services Building (9B), lower level closest to the west entrance. You may contact them at (909) 274-4290 (Voice) or 909-895-6634 (Video Phone for American Sign Language users).

**ELECTRONIC DEVICE POLICY:** Electronic devices (cell phones, laptops, translators, etc. – calculators okay!) **may not be used in class AT ANY TIME**, unless, of course, instructed to do so. If you text in class or your cell phone goes off in class, you will be **penalized 10 points** and your cell phone will be confiscated until the end of class! (Breaks too!)

**ATTENDANCE:** **It is important to come to class.** Reading the book does not help your understanding of the material in the same way that interacting with others in class will; besides, some of the material we will cover is not found in your book. Since you chose this class over others, I will assume that you intend to be here, and if you miss a class then a real emergency has occurred. **As long as it is not an exam day, you need not bring an excuse, but you cannot make up a quiz** under any circumstances. If something is due, you must still turn it in on time; consider giving it to a classmate to turn it in, or **e-mail it to me**.

Attending class means doing more than filling a seat. This is YOUR class, and YOU can get out of it what YOU put into it. You should have enough respect for yourself (YOUR time is valuable!) that you take every advantage of this

opportunity to learn as much of this interesting and very important material as you can. Furthermore, you should not be disruptive – **don't let your cell phone go off**, don't show up late or unprepared, don't snore, etc. You should always respect your peers.

**Attendance Regulations:** Roll is taken at the beginning of class each day. Starting with the SECOND DAY of class (\_\_\_\_), you will be marked TARDY if you come in during roll but after your name is called, and you will be marked ABSENT if you are not present during roll. This means that even if you come in "only" 5 minutes late, you'll be marked *absent*! Furthermore, if you leave class early, you will be marked absent. **Excessive tardiness/absence will result in your grade being lowered - by one letter for every 2 absences!**

**DROP POLICY:** You should read the College Attendance, Drop and Withdrawal Policies (find them in the Schedule of Classes). In this class, if you missed the field trip, are not passing the class and/or are marked absent for **one exam or more than 4 classes** by the final drop date, I may drop you (unless you have cleared your circumstances with me). However, DO NOT *expect* me to drop you – if you are no longer attending class, you should take the initiative to drop or you may receive a grade of F! Remember, these rules are in place to help YOU succeed! Below are important drop deadlines for the current semester:

Last Day To: Is:	Add the Class <b>Jan 10</b>	Drop w/ Refund <b>Jan 10</b>	Drop w/ NO Refund and no "W": <b>Jan 16</b>	Withdraw <b>Jan 31</b>
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**Cheating:** Cheating is not tolerated. **A student who plagiarizes or cheats in any way shall fail the course, and** a letter will be written and placed in the student's file in Student Services. ***Just don't do it!***

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Your grade in this course will be determined from my assessment of your understanding of the material, based on the total number of points you earn as a percentage of the total expected:

Mastery:     **A = >90%**  
Solid:         **B = 80 - 89%**  
Basic:         **C = 70 - 79%**  
Partial:       **D = 60 - 69%**  
Insufficient: **F = <60%**

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**Reading Assignments:** The following is a TENTATIVE schedule indicating the order of topics to be covered. You should come to class having FOUND THE PERTINENT CHAPTER(S), and also having READ and UNDERSTOOD the material well enough that you are prepared to discuss it! If you are having trouble doing all of this, then you should make a point to visit with me outside of class.

## Tentative Outline: Introduction to Astronomy

Date	<u>Lecture Topic</u>
1/9	Thinking like an Astronomer; scientific method; math info
1/10	Patterns in the Sky: Motions of Earth and Moon
1/11	Laws of Motion: Ancients, Galileo, Kepler, Newton
1/16	<b>Exam #1;</b> Nature of Light
1/17	Optics, Telescopes and Cameras
1/18	Formation of Stars and Planets (Nebular Hypothesis)
1/23	<b>Exam #2;</b> Our Solar System: Terrestrial Planets and the Moon
1/24	Atmospheres; Greenhouse Effect and Climate Change
1/25	Jovian Planets (Gas Giants)
1/30	<b>Exam #3;</b> Small Bodies: Pluto; dwarf planets; asteroids; comets; meteors
1/31	Our Star, The Sun; Measuring the Stars
2/1	Stellar Evolution
2/6	<b>Exam #4;</b> Neutron Stars and Black Holes
2/7	The Milky Way; Measuring Galaxies
2/8	Evolution of the Universe: modern cosmology; age and shape of the universe
2/13	TBA
2/14	Life in the Universe; astrobiology
2/15	<b>Exam #5 (COMPREHENSIVE)</b>