

Course Code & No. - Section: ESCI121-1
Course Title (Credits): Introductory Astronomy (3)
Term & Year: Fall / 2015
Course Ref. No. (CRN): 80331

Instructor: Gigi Giles
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Office: TCES 214
Office Hours: By appointment

Class Meeting Time: MW 7:00 – 8:15 pm
Location: TCES 205

Prerequisites: none
Corequisites: none

Course Description

An introduction to planetary and stellar astronomy, and cosmology. Course topics include the cycles of the sky, observing the night sky, the Solar System, stellar evolution, galaxies, and the nature of the Universe.

Student Outcomes

Upon successful completion of ESCI121, students will have demonstrated the ability to:

1. Describe the diurnal (daily) and annual motions of the celestial sphere
2. Understand the nature of electromagnetic radiation and its importance in astronomical research
3. Discuss the origin of the Solar System and the diversity of Solar System objects
4. Discuss the nature and life cycle of stars
5. Identify three basic types of galaxies and describe their evolution
6. Discuss current theories on the origin and evolution of the Universe

Methods of Assessing Student Outcomes

Outcomes will be assessed through exams and final exam, observational projects, CPAs, and class presentations.

Instructional Strategies

Students will prepare for class by reading assigned materials and completing CPAs. Class time will be spent on clarifying questions about reading or homework assignments, lecture and discussion, indoor and outdoor activities, and student presentations.

Required Texts and Materials

1. Jay M. Pasachoff & Alex Filippenko, *The Cosmos*, 4th ed. Cambridge University Press, NY. ISBN: 978-1-107-68756-1.
2. Access to a computer (one that meets the published SNC Computer Requirements) and internet.
3. Red bulb flashlight. Red lights will be used during dark-sky activities. White lights (including phone lights) destroy night vision and will not be allowed. These are available at Ace Hardware near Raley's.

Moodle

The Syllabus will be posted on Moodle. Vital information on assessment items will also be posted. Check Moodle regularly for announcements and schedule changes.

Course Policies:

1. Attendance: Success in Introductory Astronomy is directly related to participation in lecture/discussions and activities. Class will begin promptly at the start time. Please do not arrive late or leave early. Late work will NOT be accepted from students who skipped class on the due date. The instructor MAY choose to excuse an absence and accept late work, but absences related to travel for weekends or holidays and employment will not be excused.

2. Electronic Devices: Students are not permitted to use MP3 players in class at any time, including during exams. Cell phones, tablets, and laptops may be used to access online resources or take notes in class. Students have permission to tape classes for later study. Students will be asked to stow phones, tablets, and laptops if used for non-class-related activities.

3. Late Work: Homework and assignments are due at the beginning of the class period on the due date unless the instructor permits students to hold them while asking questions. Late work will be accepted, but students will lose 10% of the possible points for each calendar day that work is late. Work more than seven days late will not be accepted.

4. E-mailed Work: If you wish to email work, it must be generated on a computer (not handwritten) and submitted by e-mail as .doc or .pdf. **The file name must be as follows: TitleLastnameFall2015.doc (or .pdf).** The instructor will reply to verify that e-mailed work was received. It is the student's responsibility to follow up if the instructor does not reply about e-mailed work.

5. Outdoor Observations/Activities: Outdoor and off-campus activities are considered 'class time' and are subject to course policies. Attendance is required. Please dress warmly and wear sturdy shoes. No smoking. No dogs.

Times and locations of outside activities will be discussed and determined in class. Outdoor activities are subject to weather conditions and will be scheduled accordingly. Dark-sky activities may be scheduled on class nights, as late as 10:00 pm, depending on sunset times. Your input regarding activity scheduling is vital. If you have scheduling conflicts, contact the instructor in advance.

6. Extra credit: The instructor may offer extra credit for additional work with instructional value. A student may earn up to 50 extra credit points, 5% of the total number of points possible for the class.

7. Modifications to the ESCI121 course syllabus: This syllabus and schedule is intended to provide students with a clear and accurate outline of course content, student outcomes, class topics, assignments, due dates, and exam dates. Please be aware that **the schedule will change according to weather conditions**. Students should keep and refer to the syllabus regularly, and learn how to access it on Moodle. The instructor reserves the right to make announced changes to the syllabus and class schedule at her discretion if it is in the best interest of the students to do so. Major changes, such as changes to exam dates or coverage and permanent changes to the schedule, will be posted on the Moodle site and students will be e-mailed about such postings

Prim Library Resources

Using the library's resources effectively (not just Internet resources) contributes to developing each of SNC's core themes by exposing students to high quality academic resources, diverse opinions, new ideas, and a future that includes building on a liberal arts education. In this course, you will be expected to utilize the library's resources (either on-site or remotely) as you complete your assignments.

Prim Library Resources for ASTR 121 includes, but is not limited to:

1. Reference materials (for use inside Prim Library):
Mitton, J. Cambridge Illustrated Dictionary of Astronomy (2007) Cambridge: Cambridge University Press. This is a comprehensive dictionary of astronomical terms and acronyms with fascinating images and illustrations. Star maps, biographical sketches, and space missions are included.
2. Books (can be checked out):
 - a. In general, books related to astronomy have Library of Congress Classification numbers beginning with QB. Some topics, such as electromagnetic theory and gravity, can be found in the physics section (QC). However, you will find books related to our course with other LCC numbers, so search the Prim Library Catalog using key words related to your term paper topic.
 - b. Blum, D., Knudson, M., and Henig, R. M., eds. (2006) *A Field Guide for Science Writers*, 2nd ed. London: Oxford University Press. LCC number: T11.F52 2006. A detailed resource for writing

scientific papers that will help you with voice, tense, and other nuances of scientific writing required for your lab reports.

- c. The Prim Library has a good collection of books for stargazers and amateur astronomers.
3. Electronic databases (for peer-reviewed research articles, reviews, and newspaper and magazine articles): Electronic databases most likely to include articles related to your term paper topics are EBSCO: Academic Search Premier and General Science Collection.
4. Hardcopy periodicals: Prim Library has current subscriptions for Science, New Scientist, Science News, and National Geographic Magazine. Any of these may have articles on your term paper topic. Full-text articles from many more periodicals are available through the electronic databases.
5. Lib Guides: <http://Libguides.sierranevada.edu> These web pages contain instructions about how to use resources available at Prim Library, how to evaluate the appropriateness of information from the Internet for a research paper, how to cite sources, and other topics related to finding and using information.

Sanctions for Cheating and/or Plagiarism

The Honor Code

The faculty of SNC believes students must be held to high standards of integrity in all aspects of college life in order to promote the educational mission of the College and to encourage respect for the rights of others. Each student brings to the SNC community unique skills, talents, values and experiences which, when expressed within the community, contribute to the quality of the educational environment and the growth and development of the individual. Students share with members of the faculty, administration and staff the responsibility for creating and maintaining an environment conducive to learning and personal development, where actions are guided by mutual respect, integrity, responsibility, and trust. The faculty and students alike must make diligent efforts to ensure high standards are upheld by their colleagues and peers as well as themselves. Therefore, faculty and students accept responsibility for maintaining these standards at Sierra Nevada College and are obligated to comply with its regulations and procedures, which they are expected to read and understand.

Consequences of Violating the Student Honor Code

SNC students and faculty share the responsibility for maintaining an environment of academic honesty. Thus, all are responsible for knowing and abiding by the SNC Faculty/Student Honor Code published in the current SNC Catalog. Faculty are responsible for presenting the Honor Code and the consequences of violating it to students at the start of their classes AND for reporting all incidences of academic dishonesty to the Provost. Students are responsible for knowing what constitutes CHEATING, PLAGIARISM and FABRICATION and for refraining from these and other forms of academic dishonesty. Violations of the Honor Code become part of a student's academic record.

1st Offense: Student receives a zero for assignment/exam and counseling with faculty on the honor code, consequences for violating the honor code, and the value of academic honesty in learning.

2nd Offense: Student fails course and receives counseling with faculty on the honor code, consequences for violating the honor code, and the value of academic honesty in learning.

3rd Offense: Student is expelled.

Cutting and pasting or copying phrases or sentences from internet sources, books, articles, or other students is a violation of the student honor code. If you consistently write using your own words, you will avoid plagiarizing or cheating.

Grading Policy

The grading curve is based on a 1000-point scale. Sierra Nevada College awards half grades (e.g., A- or B+), so a student with a point total within 1.5% of the cutoff for the letter grade will earn the appropriate half grade.

| GRADING CURVE | |
|---------------|-------------------|
| A | 900 – 1000 points |
| B | 800 – 899 points |
| D | 580 – 679 points |
| F | < 580 points |

| ASSESSMENTS | VALUE |
|--------------------------|------------|
| CPAs | 100 points |
| Moon Observation Project | 150 points |
| Team Presentations, 2 | 150 points |
| Exams, 4 | 400 points |
| Final | 200 points |

Class Preparation Assignments

Twelve or more assessment opportunities will be given for CPAs. Your ten best grades will be recorded. CPAs must be submitted before the start of class on their respective due dates. No make-up work will be given.

Moon Observing Project

The Moon observing project is one of the most important assignments you will have. Good work is expected. The project is not difficult, but it requires advance planning and careful attention to deadlines. Begin planning your Moon observations right away. **You will have enough time to finish, regardless of the weather, if you plan correctly.** Bad weather is not an acceptable excuse. Follow the instructions carefully and turn in all required work. Do not plagiarize. **Do not create work based on “pretend” observations—you will be penalized.** The project is due on or before **November 17**. Late work will be penalized.

Team Presentations

Team presentations will be assigned. Teams will present powerpoint presentations on topics given by instructor. Each student will be responsible for creating a prescribed number of ppt slides, and for presenting their slides.

Exams and Final Exam

Exams will be closed book/closed computer. Students are allowed to bring one 3x5 index card with notes, hand written. The exams consist of multiple choice, short-answer, and critical-thinking essay questions. The exams are designed to assess your understanding of concepts and processes. They will include key vocabulary terms, but will not require regurgitation of facts and numbers (with a few exceptions, e.g. distance from Earth to Sun).

The Final exam is Saturday, December 12, 6:30 – 9:30 pm. It is a comprehensive exam.

ADA Accommodations

In accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, students with a documented disability are eligible for support services and accommodations. If a student wishes to request an accommodation, please contact the Director of Academic Support Services, Henry Conover, at (775) 831-1314 x7534, hconover@sierranevada.edu, office in Prim Library: PL-304.

The SNC Email System

The SNC email system is the official communication vehicle among students, faculty members, and administrative staff and is designed to protect the confidentiality of student information as required by the Family Educational Rights and Privacy Act of 1974 Act (FERPA). Students should check their college email accounts daily during the school year.

Students have a right to forward their SNC e-mail to another e-mail account (for example, @hotmail or @gmail). However, confidentiality of student information protected by FERPA cannot be guaranteed for SNC e-mail forwarded to an outside vendor. Having email redirected does not absolve a student from the responsibilities associated with official communication sent to his or her SNC email account.

The Sierra Nevada College Mission Statement:

Sierra Nevada College graduates will be educated to be scholars of and contributors to a sustainable world. Sierra Nevada College combines the liberal arts and professional preparedness through an interdisciplinary curriculum that emphasizes entrepreneurial thinking and environmental, social, economic, and educational sustainability.

The Core Themes:

| | |
|-----------------|---------------------------|
| Liberal Arts | Professional Preparedness |
| Entrepreneurial | Thinking Sustainability |

COURSE SCHEDULE**ESCI121-1 Introduction to Astronomy**

| Week | Date | Reading: <u>The Cosmos</u> | Lecture/Activity | Assessments |
|------|--------|---|--|-------------|
| 1 | Aug 18 | Chapter 1 | Syllabus, What is Astronomy? | |
| | Aug 20 | 4.0 – 4.4 | Celestial Sphere and Cycles of the Sky | CPA 1 |
| 2 | Aug 25 | 4.5 – 4.8, 4.10 | Kinesthetic Astronomy | |
| | Aug 27 | 3.1 – 3.3, 3.5 | Telescopes and Amateur Astronomy | CPA 2 |
| 3 | Sep 1 | http://skymaps.com/downloads.html Print map: August 2015: Northern Edition for August (Sept. if available.) and bring to star party | STAR PARTY Village Green | |
| | Sep 3 | | | EXAM 1 |
| 4 | Sep 8 | Chapter 2 | The Nature of Light | CPA 3 |
| | Sep 10 | https://www.youtube.com/watch?v=3ld1ygiwY4k | Looking Back in Time | |

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|----|----------|--|-------------------------------------|-------------------|
| 5 | Sep 15 | | Telescopes Across the Spectrum | Team Presentation |
| | Sep 17 | 5.5 – 5.8, Figure It Out 5.3 (p. 112), https://www.youtube.com/watch?v=HTGOvqi8GsU | Gravity and Motion | CPA 4 |
| 6 | Sep 22 | Browse https://www.nasa.gov/ , http://www.esa.int/ESA , http://global.jaxa.jp/ | Rocket Science | |
| | Sep 24 | | | EXAM 2 |
| 7 | Sep 29 | Open this link and scroll through to the end. http://joshworth.com/dev/pixelspace/pixelspace_solarsystem.html | Scale of the Solar System | |
| | Oct 1 | | Solar System Bodies | Team Presentation |
| 8 | Oct 6 | http://skymaps.com/downloads.html Print map:October 2015: Northern Edition for August and bring to star party | STAR PARTY Dark sky site TBD | |
| | Oct 8 | Ch. 20 | Astrobiology | CPA 5 |
| | Oct 9-11 | SCIENCE DEPT. CAMPOUT -- Optional | | |
| 9 | Oct 13 | 9.2 – 9.6 | Exoplanets | |
| | Oct 15 | Find a current astronomy news article that interests you. Be prepared to share it in class. | In The News | |
| 10 | Oct 20 | | | EXAM 3 |
| | Oct 22 | 11.0 – 11.5, 12.0 – 12.2, 12.4, 12.5 | Life Cycle of Stars | CPA 6 |
| 11 | Oct 27 | Ch. 13 | Stellar Remnants | CPA 7 |
| | Oct 29 | Ch. 14 | Black Holes | CPA 8 |
| 12 | Nov 3 | 15.1, 15.4, 15.8, 16.1 - 16.3 | Milky Way and Galaxies | CPA 9 |
| | Nov 5 | 16.4, 16.5 | Dark Matter | |
| 13 | Nov 10 | Ch. 17 | Quasars, Active Galaxies, and SMBHs | CPA 10 |

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|----------|-----------|-------------------------------|--------------------------------|----------------------------|
| | Nov 12 | | | EXAM 4 |
| 14 | Nov 17 | 18.0 – 18.3 | Birth and Life of the Universe | Moon Observing Project Due |
| | Nov 19 | Ch. 19 | Big Bang and Inflation | CPA 11 |
| HOLI DAY | Nov 23-27 | Thanksgiving Break | | |
| 15 | Dec 1 | 18.5 – 18.6 | Expansion and Dark Energy | CPA 12 |
| | Dec 2 | | Review | |
| | Dec 12 | Final Exam, 6:30 pm – 9:30 pm | | FINAL |