

## ASTR 111, ASTR 111/111A – All Sections, Spring 2012

<http://astro.physics.sc.edu>

### COURSE PERSONNEL

Prof. Carl Rosenfeld, Instructor and Course Supervisor – [lcr@sc.edu](mailto:lcr@sc.edu) – PSC Rm 605 – 777-8145.

Dr. Soheila Gharanfoli, Instructor and Astronomy Center Director – [soheila@sc.edu](mailto:soheila@sc.edu) – PSC Rm 007A – 576-6235.

Mr. Alex Mowery, Director of the Melton Memorial Observatory – [mowery@physics.sc.edu](mailto:mowery@physics.sc.edu).

Dr. Dan Overcash, Associate Director of the Melton Memorial Observatory – [overcash@physics.sc.edu](mailto:overcash@physics.sc.edu).

Numerous lab instructors and Astronomy Center staff members. You can find them listed on the course website.

**Email is reliable. Telephone is not.**

### COURSE WEBSITE

The URL of the course website is <http://astro.physics.sc.edu>. Here you will find links to this document, sample questions, progress check, and lab schedule. You will also find links to a rogues' gallery of lab instructors, to various other documents, and to several websites that are likely to be of interest to a student of astronomy.

### LEARNING OUTCOMES:

1. Students will understand the nature and history of astronomy as a science.
2. Students will understand how physical laws were discovered and how this knowledge has enabled astronomers to construct a worldview of the structure and history of the universe.
3. Students will understand astronomers' current construct of the universe from the Earth, through the solar system, our galaxy, and the distant universe. They will also understand the methods used.
4. Students will be able to explain:
  - a. Scientific description of the night sky and how time determines what is visible.
  - b. The physical laws that determine the orbits of the planets and when, how, and by whom these laws were determined.
  - c. The nature of light and the technology of telescopes.
  - d. The methods used to determine the nature of stars and their distances.
5. Students will appreciate the cultural and practical importance of artificial near-Earth satellites.
6. Students will understand the distinctions between science, non-science, and pseudo-science.

### GENERAL INFORMATION

Welcome to Astronomy 111, a self-paced mastery oriented course. On the first two class days of the semester the Instructors conduct orientation sessions at times posted by section on the *Registrar's Master Schedule*, and attendance is highly recommended. After the second day of class, however, the sections do not meet at those times or any other times. ASTR 111 is a three-credit hour course. The addition of ASTR 111A allows a student to raise the number of ASTR credit hours from three to four. All ASTR courses, individually or in combination, are laboratory science courses and require participation in labs. The lab sessions follow a liberal schedule, and students register themselves in the lab sessions of their choosing. The course material is divided into sections we call "units." The number of units mastered and the specific units mastered determine the course grade(s). Students demonstrate mastery of a unit by satisfactory performance on an "evaluation" administered in the Center's evaluation (EV) room, PSC 008, or by completion of a lab, or both depending on the unit. All documents and other items required to attain masteries are listed in the table below:

STUDY GUIDE	Self-Paced Study Guide and Laboratory Exercises in Astronomy, J. L. Safko, 12 <sup>th</sup> Ed. Available at the bookstores as a downloadable e-document. The e-document is also available for purchase online. Find the link at <a href="http://astro.physics.sc.edu">http://astro.physics.sc.edu</a> . <b>Study Guide is a mandatory purchase for all students.</b>
TEXTBOOK	Discovering Astronomy—USC, Shawl, LoPresto, and Safko, 4 <sup>th</sup> Ed. The publisher has bundled the textbook with the Study Guide.
CALCULATOR	Needed for labs – must include log and trig functions, e.g. TI 25X.
SYLLABUS	This document.
EMAIL ADDRESS	An email service at which you read mail sent to <a href="mailto:username@email.sc.edu">username@email.sc.edu</a>
CAROLINA CARD	You must have a Carolina Card with you at all times in the Astronomy Center.

The course administrators will be sending essential and time-sensitive notices to you via your University email address, [username@email.sc.edu](mailto:username@email.sc.edu). It is your responsibility to ensure that this communication channel is consistently functional.

### PLACE AND HOURS OF OPERATION

The Astronomy Center occupies a *suite of rooms* on the basement and mezzanine levels of the Jones Physical Science Center (PSC). Students must come to the Center for evaluations and most of the labs. PSC 007D and PSC 005 are rooms where you may find study aids. Astronomy Center staff are frequently on duty in PSC 007 to provide tutoring. The activities of some of the units are conducted at *Melton Memorial Observatory* and other sites. The usual *hours of operation*

of the Astronomy Center are Mon - Thu 9:00 AM – 8:00 PM, Fri 10:00 AM – 3:00 PM, and Sun 5:00 PM – 9:00 PM. The table of “Important Dates” at the end of this document specifies a few departures from this schedule.

### INDEX CODE AND PROGRESS CHECKING

We use a four-letter code, the “index code,” to identify you and to provide privacy. If your enrollment is in good order on Tue 10 Jan, your index code will be emailed to you. Otherwise you will receive this code on the first occasion, usually during Lab 0, on which you present your Carolina Card to staff in the Astronomy Center. You must use this code in conjunction with your *VIP ID* as credentials for checking progress and scheduling labs on the *ASTR website*. Credentials are not required to retrieve sample questions. In general the website will be available from any location that has Internet connectivity. You should check your progress regularly and promptly report discrepancies between the course records and your private records. When a student has completed all requirements for a specific unit, that unit appears in the list of units designated “AVAILABLE FOR CREDIT.” Your grade will be based upon the units in this category.

### LABORATORIES

If you take a unit that specifies a lab as part of its mastery, you must do the lab to receive credit for the unit. Units 2-7 include a lab as a part of the mastery and are among the required units for all students. Thus all students must complete at least six labs (in addition to Lab 0). The lab of a unit may be done before or after the evaluation for that unit. Each of the basic labs (2-7) will take two hours to complete. During each of the first seven weeks of the semester you should allocate a two-hour block of your time for ASTR lab. Students who complete the labs for Units 2-7 before 13 March will receive as a bonus credit for Unit 54. Most ASTR labs meet in *PSC Z131, Z132, and Z133*. A few of them meet in PSC 105, which is external to the Astronomy Center suite.

The first “lab” meeting, Lab 0, which will be less than two hours, will familiarize you with the lab procedures. Sessions will start on Wed 11 Jan. Sign-up sheets for slots in Lab 0 will be posted on the exterior wall of the EV room (PSC 008) from 8:30 AM on the first day of classes. Ordinarily students sign up immediately after their orientation session.

With the exception of Lab 0 students must register for lab sessions at the *ASTR website*. Registration will open at 1:00 AM on Wed 11 Jan, and as soon thereafter as feasible you should register for sessions of Labs 2-7. You may freely alter your registration through Wed 25 Jan. After 25 Jan you may reschedule Labs 2-7 on two days of your choosing without penalty. Even after you have used up your two-day quota, you may continue to reschedule labs, but for each day on which you do that the number of mastered units counting toward total units will be reduced by one. Registration for the labs of elective units (Units 9, 16, 24, 27, 30, and 58) is similarly constrained until the student has completed the required labs. Thereafter registration in elective labs is unconstrained. You may not register for more than one session of the lab of any particular unit. Whereas ample opportunity for lab registration will exist at the start of the semester, toward the end you will likely find that all sessions are full. This circumstance will not engender the creation of additional lab sessions. Thus if you do not sign up for required labs early, **you should expect to fail the course.**

Check-in for labs of Units 2 and above requires that you have passed the corresponding “pre-lab,” a short evaluation to show that you are familiar with the terminology of the lab exercises. Pre-labs for Units 39-43 require correct responses to 8 out of 10 questions, and all others are 4 out of 6. Pre-labs must be completed in the EV room during the seven days preceding the lab session. After seven days they go “stale” and must be repeated. Short videos are available on the *ASTR website* to aid you in your preparation.

If you purchased the electronic version of the Study Guide, then in advance you must print all of the pages (in full size) from the Study Guide pertinent to the lab you will be attending and have those pages in hand at check-in time. The personalization on those pages must match your Carolina Card. Lab instructors will not accept pages printed from a different student's Study Guide. In addition to Study Guide pages you must bring to the lab a pencil, a scientific or graphing calculator such as a TI 25X, and, of course, your Carolina Card. In the case that your Study Guide is the hardcopy version, then as a condition for check-in at any lab you must have in hand the entire Study Guide.

### OBSERVATORY

The *Melton Memorial Observatory*, home to a 40 cm telescope, is open to the general public on Monday evenings, weather permitting, beginning 30 minutes after sunset. You are welcome to drop in during these hours. The observatory is located on Greene St. opposite the Russell House. Students enrolled in any of the ASTR courses have the opportunity to earn credit for up to nine units through activities at the Observatory. Units 45-48, 49/50 and 60 require attendance on nights other than Monday, and Units 55 and 59 require daytime activities at the Observatory. The schedule of Observatory sessions and sign-up sheets will be posted in the corridor outside of PSC 007C.

### PLANETARIUM LECTURES — UNIT 51

The planetarium program is excellent preparation for Unit 2. Because the seating accommodates only 30 students at a time, the program will be rerun several times. Planetarium sessions will be offered during one week early in the semester. The schedule of sessions will be posted in the hallway outside of Room 007C. You may reserve a seat by signing up on the list. Unreserved seats are available on a first-come first-served basis at lecture time. The planetarium will be set up in the

Concourse of the Carolina Coliseum. The location of the planetarium is shown on a map posted near the sign-up sheets. Be on time — the door is locked at the start of the program. The program lasts 50 min. You may not attend the planetarium program more than once. Have your Carolina Card with you to get credit for Unit 51 at the end of the show.

**GRADING SYSTEM**

To be credited toward your grade units must appear on the line “AVAILABLE FOR CREDIT” (shown on the ASTR website). In the following tables “List X” refers to Review Units 11, 15, 21, 25, 29, and 33. Credit for units beyond the required units may be obtained with any other units that are offered. No unit may earn credit in more than one ASTR course. All parts of any unit selected must be completed. In the 4-credit hours table the first grade is for ASTR 111 (the 3-credit hour grade) and the second grade is for ASTR 111A (the 1-credit hour grade).

**Enrolled in ASTR 111 only (3 credit hours)**

GRADE	TOTAL UNITS NEEDED	REQUIRED UNITS	ELECTIVE UNITS
A	17 (20)	1-8, 44 + 2 (from List X) ( 1-7, 44 + 3 (from List X) )	6 (9)
B+	16 (19)	1-8, 44 + 1 (from List X) ( 1-7, 44 + 2 (from List X) )	6 (9)
B	14 (17)	1-8, 44 ( 1-7, 44 + 1 (from List X) )	5 (8)
C+	13	1-7, 44	5
C (S)	11	1-7, 44	3
D+ (U)	10	1-7, 44	2
D	8	1-7, 44	0

**Enrolled in ASTR 111 & ASTR 111A (4 credit hours)**

GRADE (111/111A)	TOTAL UNITS NEEDED	REQUIRED UNITS	ELECTIVE UNITS
A/A	22 (25)	1-8, 44 + 2 (from List X) ( 1-7, 44 + 3 (from List X) )	11 (14)
A/B	21 (24)	1-8, 44 + 2 (from List X) ( 1-7, 44 + 3 (from List X) )	10 (13)
B+/A	20 (23)	1-8, 44 + 1 (from List X) ( 1-7, 44 + 2 (from List X) )	10 (13)
B+/B	19 (22)	1-8, 44 + 1 (from List X) ( 1-7, 44 + 2 (from List X) )	9 (12)
B/B	18 (21)	1-8, 44 ( 1-7, 44 + 1 (from List X) )	9 (12)
B/C	17 (20)	1-8, 44 ( 1-7, 44 + 1 (from List X) )	8 (11)
C+/B	16	1-7, 44	8
C+/C	15	1-7, 44	7
C/C (S/S)	14	1-7, 44	6
C/D (S/U)	13	1-7, 44	5
D+/C (U/S)	12	1-7, 44	4
D+/D (U/U)	11	1-7, 44	3
D/D	10	1-7, 44	2

List X: The review Units 11, 15, 21, 25, 29, and 33.

**Each missing required lab will incur a penalty of one full letter grade, and each missing required evaluation will incur a penalty of two full letter grades.**

In lieu of mastery of Unit 8 a student may **increase** the **Total Units Needed** (and the elective units) by three **and** the **number of List X units** required by one as shown in parentheses in the tables above. Please see the Astronomy Center Director if you are retaking this course or have any questions about these grade tables. Do not confuse Required Units and Total Units in these tables. For example, to earn a B for a 3-hour enrollment one must complete units 1-8, 44, and 5 additional units. Units completed in excess of those required for the assigned grade will carry over to an ASTR enrollment in the following semester, but no portion of incomplete masteries will carry over.

If your college permits, these courses may be taken on a Pass/Fail basis. The requirements for “S” are the same as the requirements for “C.” (See the tables above.) Obtain the necessary form from your dean’s office. The form requires you to enter the name of the ASTR instructor, but it does not require the instructor’s signature.

Incompletes are given only in cases of unanticipated illness, accident, work-related responsibility, or family hardship. A request will be considered only if the student has shown proportional progress towards a passing grade during that portion of the semester not covered by the exigency. Failure to meet the 2<sup>nd</sup> milestone as explained below is prima facie evidence against proportional progress. A request for an incomplete must be in writing (email qualifies), in detail, and must clearly explain how the circumstances fit the eligibility requirements. It must be submitted no later than the last day of classes. Supporting documents must be submitted as hardcopy. An interview with the Astronomy Center Director will also be necessary.

**MILESTONES**

Two milestones established for the course will encourage you to begin work early in the semester and to set a steady pace. The first milestone is the completion of Unit 1 by day 15 of the semester. The second milestone is the mastery of at least three of the required units (excluding Unit 1) or equivalent by day 35 of the semester. For this purpose a lab and an evaluation will each count as ½ unit. Students who fail to meet the 2<sup>nd</sup> milestone will become ineligible for grade of “I” regardless of other circumstances.

**NUMBER OF TRIES PER DAY**

You may take evaluations and pre-labs for as many different units per day as you wish. For a particular unit, however, the daily limit is three, and at least 30 minutes must intervene between attempts. After four unsuccessful attempts on any of the units you should bring your lists of missed objectives to an Instructor or to a senior student staff member at the help desk. Staff in the EV room are not available to work with students. Experience shows that consultation with staff efficiently lubricates the path to mastery.

**TUTORIALS**

To assist with the mastery of the basic astronomy units (2-7) the Center will present a series of 1.5-hour tutorials. The schedule for these will be announced by email during the semester.

**BONUSES**

From 11 Jan to 13 Feb the number of correct responses required for mastery of Units 2-4 is reduced from 13 to 12. From 11 Jan to 12 March the number of correct responses required for mastery of Units 5-7 is reduced from 13 to 12. Completion of the labs of Units 2-7 before 13 March earns as a bonus “mastery” of Unit 54. Attendance at one of the tutorials will earn a one-question discount on some evaluations. See the tutorial announcement for details.

**STUDENTS WITH DISABILITIES**

If you have a disability, it is essential that you speak to the Astronomy Center Director early in the semester to make the arrangements necessary to support a successful learning experience. You must also arrange for the Office of Disability Services to provide a Letter of Accommodation to the Astronomy Center Director. Although the Astronomy Center suite is not wheelchair accessible, the ASTR courses readily accommodate wheelchair-bound students. Such students must attend labs in PSC 105, which entails some compromise in the selection of lab meeting times.

**CODE OF ACADEMIC RESPONSIBILITY**

As a condition of enrollment in this course we require you to sign a pledge of adherence to the Codes of Responsibility of the University and the Astronomy Center. It is the responsibility of every student at the University of South Carolina to adhere steadfastly to truthfulness and to avoid dishonesty, fraud, or deceit of any type in connection with any academic program. Any student who violates this principle or who knowingly assists another to violate this principle shall be subject to discipline by the University. Said discipline is in addition to any grade penalty that the Instructors may impose — usually an F and reversal of all credit awarded in the semester.

**IMPORTANT DATES AND DEADLINES – SPRING 2012**

Jan 9-10	First class days. Students attend orientation sessions and sign up for meetings of Lab 0.
Jan 11	Center opens for evaluations and first meetings of Lab 0. Lab registration opens on the <i>ASTR website</i> .
Jan 15-16	Center closed for MLK Jr. Holiday.
Jan 24	1 <sup>st</sup> Milestone: If by this date you have not attained mastery of Unit 1, you are advised to withdraw.
Jan 25	Last day of unconstrained lab registration.
Feb 13	2 <sup>nd</sup> Milestone. The milestone stipulates completion by this date of at least three of the required units (excluding Unit 1) or equivalent. Successful evaluations and labs each count as 1/2 unit for this purpose.
Feb 14	The number of correct responses required for mastery of Units 2-4 rises from 12 to 13.
Feb 27	DROP DAY. Students in ASTR 111 who have missed the 2 <sup>nd</sup> milestone are strongly urged to withdraw.
March 4-9	Center closed for Spring Break. Center reopens on Sun 11 March at 5:00 PM.
March 13	Students who have completed the labs of Units 2-7 receive as a bonus credit for Unit 54. The number of correct responses required for mastery of Units 5-7 rises from 12 to 13.
April 20	For some or all of Labs 2-7 this day will be the last. Probably these sessions filled up many days earlier.
April 23	Last day to attempt an evaluation. The Center closes for the semester at 8:00 PM. Requests for incompletes after this date will be automatically denied. You should check your progress before the center closes and report errors promptly.
April 27	Students may expect grades to be posted on VIP on or before this date.

**CELL PHONES AND OTHER ELECTRONIC GADGETS MUST BE TURNED OFF IN THE ASTRONOMY CENTER.**