

Astronomy 3: Stellar Astronomy

General Information

Instructor: Dr. Anne Metevier
Schedule: Tuesday and Thursday 10:30am – noon, Lark 2009
Contact: email: ametevier@santarosa.edu
Office hours: Thursdays 9:30 – 10:20am or by appointment, Lark 2023

Course Description

A description of the universe, concentrating on celestial bodies and phenomena beyond the Solar System. Topics will include electromagnetic radiation, observed properties of stars, variable and binary stars, extra-solar planets, stellar evolution, black holes, relativity, the interstellar medium, star clusters, the Milky Way and other galaxies, cosmology, and the possibility of other life forms in the universe.

Student Learning Outcomes

Upon completion of this course, students will be able to:

1. Evaluate astronomical hypotheses using evidence-based reasoning and the scientific method.
2. Recognize and describe the various astronomical bodies, concentrating on the celestial bodies beyond the Solar System.
3. Summarize the processes which govern the evolution of a star and use this knowledge to predict when and how stars of varying color and mass will die.

Recommended Preparation

Completion or Concurrent Enrollment in Math 150A AND English 100 or ESL 100

Required Textbook, Materials, and Readings

Course textbook: *Openstax Astronomy* by Franknoi, Morrison, and Wolff

- Available for free by downloading at <https://openstax.org/details/astronomy>
- Or, a paper copy is available at a small cost at the campus bookstore or on amazon.com
- Or, you can check out the book for a few hours at a time
 - call number QB2.A1 F73 PersCopy Sparks (Doyle library)
 - call number QB2.A1 F73 2017 (Petaluma campus library)

You will have weekly reading assignments from the course textbook, and homework assignments will depend on staying up to date with the reading.

Other required materials: 4 double-sided Scantron forms (100 questions total), binder paper

Grading Policy

Class participation	100 points	900 – 1000 points = A
Homework	200 points	800 – 899 points = B
Exam 1	150 points	700 – 799 points = C
Exam 2	150 points	600 – 699 points = D
Exam 3	150 points	0 – 599 points = F
Final exam	250 points	
Total points possible	1000 points	

I reserve the right to *slightly* raise a student's grade based on my assessment of their effort to understand the course material.

Class Participation

Participation is an important component of your final grade. I will nearly always take attendance during class. I also encourage and make note of participation during in-class discussions. There will be several in-class small-group activities that will be turned in for credit. I encourage at least one office visit during the semester.

Please note that if you miss 10% or more of the class sessions without documented excuses, it is considered excessive absence and you may be dropped from this class or fail the course.

Homework

I will give 11 homework assignments this semester through the course Canvas site. Some assignments will require writing, others will be multiple choice or short answer, and some will include a bit of each. These assignments will help you keep up with course readings and develop a stronger understanding of the course material. Homework assignments will be made available over the weekend and will be due the following Friday at 5pm. Your lowest homework score will be dropped, so that only 10 homework assignments will count toward your grade. No late homework assignments will be accepted.

Exams

There will be three midterm exams and one final exam, as listed in the course schedule. The exams will cover material from lectures, homework, reading, and in-class activities. Exams will be in multiple-choice format. Make-up exams may be given at the instructor's discretion only in case of serious illness, a medical emergency in the immediate family, or other very serious circumstances.

The final exam will be comprehensive and will take place on Tuesday, May 22 from 10am – 12:45pm. No make-up final exams will be given for any reason once grading is completed.

Extra Credit

Extra credit is available for attending an SRJC Planetarium presentation or a local astronomy observing session and submitting a one-page write-up of your experience. Specific instructions on what to include in the write-up will be given on the course Canvas site. You may submit up to 2 extra credit assignments worth up to 25 points each, for a total of 50 points. Extra credit may be submitted any time up to the last day of classes, May 18.

Classroom Etiquette / Code of Conduct

I will treat you with respect, and I expect you to treat me and your fellow students with respect at all times. In order to create an environment that is safe for learning and free of distractions, you are expected to behave according to the SRJC student code of conduct, which can be found online here: http://www.santarosa.edu/for_students/rules-regulations/student-conduct.shtml

The student code of conduct states that the following activities are prohibited: *“Obstruction or disruption of teaching, administration, disciplinary procedures, College activities, or other authorized activities on College premises.”*

Some examples of disruptive behaviors that are not permitted in this class are:

- Talking, whispering, or note-passing that is distracting to other students or the instructor
- Excessive tardiness, leaving class early, or leaving and returning to the classroom
- Inappropriate use of phones, tablets, laptops, or headphones
- Sleeping during class
- Eating meals during class (small snacks may be ok)

Consequences of disruptive behavior:

Disruptive behavior will result in one or more of the following at the instructor's discretion:

- Verbal warning
- Loss of in-class activity points
- Conference in office hours to discuss behavior
- Dismissal from class
- Additional disciplinary action at the discretion of school administrators

If I request that you come see me to discuss your behavior in class, and you fail to do so before the next class period, you will be suspended from that class. When you are suspended, you cannot make up any points that you miss due to your absence, and your absences may result in grading penalties (see note on excessive absence above).

Academic Honesty

Cheating in any form will not be tolerated. You are welcome to work on homework in groups, but make sure that the work you turn in is your own and is not copied from another person. Plagiarism of written work is cheating and will not be tolerated. Copying and pasting from websites is a rampant form of plagiarism that you must not engage in. You should **never** copy and paste anything into a homework assignment. Please refer to the Santa Rosa Junior College policy on Academic Integrity: <http://www.santarosa.edu/polman/3acadpro/3.11.pdf>

The student code of conduct states that you can be disciplined for: "*Dishonesty, such as cheating, plagiarism, or knowingly furnishing false information to the College.*"

Some examples of cheating include but are not limited to:

- Copying work from another student, or giving your work to another student to copy
- Copying and pasting text from internet sources into homework assignments or projects
- Viewing, comparing, or copying the work of another student during an exam or quiz
- Intentionally allowing another student to view your work during an exam or quiz
- Using a cell phone, smart phone, or "cheat sheet" during an exam or quiz
- Falsifying evidence to imply that you attended an event that you really did not attend

Consequences of Academic Dishonesty

If you are caught cheating on an assignment or exam, you will receive a grade of zero for that assignment. In case of severe academic dishonesty, or a repeated offense, you may be suspended for up to two class periods at the instructor's discretion in addition to receiving a zero grade. You may also be subject to additional disciplinary action at the discretion of school administrators.

Academic Accommodations for Students with Disabilities

If you need disability related accommodations for this class, such as a note taker, test taking services, special furniture, etc., please provide me with the Authorization for Academic Accommodations (AAA letter) from the Disability Resources Department (DRD) as soon as possible. If you have not received authorization from DRD, please contact them directly. DRD is located in Analy Village on the Santa Rosa campus.

Emergency Evacuation Plan

In the event of an emergency that requires evacuation of the building, please leave the class immediately, but calmly. Our class will meet in the grassy area just to the north of Baker Hall to make sure everyone got out of the building safely and to receive further instructions. If you are a student with a disability who may need assistance in an evacuation, please see me during my office hours so we can discuss an evacuation plan.

Approximate Course Schedule

I reserve the right to adjust the pacing of topics and readings slightly, depending on what seems best for students' learning in this course.

#	Day	Date	Chapter	Topic	Assignment/Test
1	Thurs	Jan 18		Course introduction	
2	Tues	Jan 23	1	Our place in the Universe	
3	Thurs	Jan 25	1, 2.4	Our place in the Universe	HW#1 due Friday
4	Tues	Jan 30	5	The nature of light	
5	Thurs	Feb 1	5	Light and spectra	HW#2 due Friday
6	Tues	Feb 6	5	Types of spectra, telescopes	
7	Thurs	Feb 8	16	Gravity, energy, and the Sun	HW#3 due Friday
8	Tues	Feb 13	16	The Sun and nuclear fusion	
	Thurs	Feb 15		No classes	
9	Tues	Feb 20	17	Stars and spectra	
10	Thurs	Feb 22			Exam 1
11	Tues	Feb 27	17,18	Masses and sizes of stars	
12	Thurs	Mar 1	18	HR diagrams	HW#4 due Friday
13	Tues	Mar 6	19	Distances to stars	
14	Thurs	Mar 8	19	Parallax and cosmic distances	HW#5 due Friday
15	Tues	Mar 13	20.1-20.3	Between the stars	
16	Thurs	Mar 15	21.1-21.3	How stars are born	HW#6 due Friday
	Tues	Mar 20		Spring break	
	Thurs	Mar 22		Spring break	
17	Tues	Mar 27	22	Star clusters	
18	Thurs	Mar 29	22	Star life stages	HW#7 due Friday
19	Tues	Apr 3	23	Planetary nebulae, supernovae	
20	Thurs	Apr 5			Exam 2
21	Tues	Apr 10	23	Star deaths and remnants	
22	Thurs	Apr 12	23	Star deaths and remnants	HW#8 due Friday
23	Tues	Apr 17	24	Relativity	
24	Thurs	Apr 19	24	Black holes	HW#9 due Friday
25	Tues	Apr 24	25	Our Galaxy, the Milky Way	
26	Thurs	Apr 26	25, 26	Our Galaxy, types of galaxies	HW#10 due Friday
26	Tues	May 1	26	The expansion of the Universe	
27	Thurs	May 3			Exam 3
28	Tues	May 8	27.1, 28	The distribution of galaxies	
29	Thurs	May 10	28	Dark matter	HW#11 due Friday
30	Tues	May 15	29	The Big Bang	
31	Thurs	May 17	29	The evolving Universe	Extra credit due Friday
	Tues	May 22			Final exam 10am – 12:45pm