Syllabus: AST102, Survey of Astronomy Lab

An Internet-Enhanced Class

Spring 2017 Scottsdale CC 01/17/17 - 05/02/17

George Muncaster

Tuesdays 7:15 - 9:45 PM

Office: SCC NS107

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Course Description: AST102 provides a variety of practical astronomical observations and laboratory exercises to reinforce critical thinking in support of AST 101 - Survey of Astronomy.

AST102 (with AST101) may satisfy AZ public university natural science (SG) requirements.

Prerequisite/Corequisite: AST101.

Course Schedule (AST102)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lab</th>
<th>Class Activities</th>
<th>Focus</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/17</td>
<td>1</td>
<td>Welcome. Review Syllabus, Notebook, Canvas. Lab: The Night Sky (Stars &amp; Constellations) Spring Constellations</td>
<td>Indoors</td>
<td>Indoor/Outdoor (+)</td>
</tr>
<tr>
<td>2</td>
<td>1/24</td>
<td>2</td>
<td>Coordinates. Spring Constellations. Lab: The Night Sky (Planetarium Software)</td>
<td>Outdoors</td>
<td>Indoors: SN C</td>
</tr>
<tr>
<td>3</td>
<td>1/31</td>
<td>3</td>
<td>Spring Constellations Lab: Optics &amp; Telescopes</td>
<td>Outdoors</td>
<td>Indoors/Outdoor C, +</td>
</tr>
<tr>
<td>4</td>
<td>2/07</td>
<td>4</td>
<td>Lab: Outdoor Observing Session (Indoor Lab: Moon Phases and Motions)</td>
<td>Outdoor Lab: SN</td>
<td>+, C</td>
</tr>
<tr>
<td>5</td>
<td>2/14</td>
<td>---</td>
<td>Constellation Quiz (Indoor Lab: Lunar Features)</td>
<td>Outdoor Quiz</td>
<td>*</td>
</tr>
<tr>
<td>6</td>
<td>2/21</td>
<td>5</td>
<td>Lab: Lunar Features &amp; Topography (Backup date for Constellation Quiz)</td>
<td>Indoor Lab: SN</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>2/28</td>
<td>6</td>
<td>Lab: Outdoor Optics &amp; Observing Practice (Backup date for Constellation Quiz)</td>
<td>Outdoor Lab: SN</td>
<td>+, C</td>
</tr>
<tr>
<td>8</td>
<td>3/07</td>
<td>7</td>
<td>Last Day to Withdraw With Guaranteed &quot;W&quot; Lab: Kepler's Laws of Planetary Motion</td>
<td>Indoor Lab</td>
<td>C, +</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interim Quiz Available at 10p.m.</td>
<td></td>
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<tr>
<td>9</td>
<td>3/14</td>
<td>---</td>
<td>LAB DOES NOT MEET (SPRING BREAK)</td>
<td>No Class Meeting</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>3/21</td>
<td>8</td>
<td>Finish Interim Quiz by 6p.m. cutoff time! Lab: Brightest &amp; Nearest Stars</td>
<td>Indoor Lab</td>
<td>(C)</td>
</tr>
<tr>
<td>11</td>
<td>3/28</td>
<td>9</td>
<td>Lab: Spectra</td>
<td>Indoor Lab</td>
<td>*</td>
</tr>
<tr>
<td>12</td>
<td>4/04</td>
<td>10</td>
<td>Lab: Distance Scale: Cepheid Variable Stars</td>
<td>Indoor Lab</td>
<td>+, C</td>
</tr>
<tr>
<td>13</td>
<td>4/11</td>
<td>11</td>
<td>Lab: Distance Scale: Hubble's Law</td>
<td>Indoor Lab</td>
<td>C</td>
</tr>
<tr>
<td>14</td>
<td>4/18</td>
<td>12</td>
<td>Lab: Distance Scale: Quasars</td>
<td>Indoor Lab</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>4/25</td>
<td>---</td>
<td>Lab: Make-Up Lab</td>
<td>Indoor/Outdoor</td>
<td>*, C</td>
</tr>
<tr>
<td>16</td>
<td>5/02</td>
<td>---</td>
<td>Final Exam</td>
<td>Indoor Exam</td>
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</table>

+ = Portions of this Lab Exercise are intended to be completed out of class.

* = Turn in Course Notebook & Learning Reflections THREE (3) times, on: 2/14, 3/28, & 4/25

SN = Students practice using Starry Night planetarium software while completing the exercise.

C = Computers are used to support the lab exercise.

Instructor Office Hours: T/Th: 4:00 - 5:15 p.m. (NS107), or by appointment (except Holidays).
Syllabus Policy: The Syllabus is a guideline for the organization of the course. The most current Syllabus version is posted on Canvas. Students must understand all Syllabus material, and abide by all requirements. Syllabus information is subject to change & we will likely be changing lab topics/depending on weather and other factors. Other changes will be announced in class and posted online at least one week in advance of taking effect. You are responsible for any announced syllabus changes whether you attend class on that date or not. Please insure your current email address as registered with SCC appears in Canvas, as it WILL be used for official correspondence with your Instructors (including for this class).

Course Materials

REQUIRED: Bring to every Class meeting!

Scientific (or Graphing) Calculator, Star Wheel/Planisphere (or equivalent Smartphone App), Course Notebook (furnished by SCC), Pencil, Eraser, Pen, Survey of Astronomy Textbook.

If you are NOT taking AST101 this semester, don't buy a textbook before speaking with me.

OPTIONAL: Strongly suggested, but not required.

Star Charts; Ruler; Binoculars, Astronomy Outline; USB Flash Drive, Books on the night sky.

Course Objectives and Methodology:

• Apply the Scientific Method and critical thinking to practical astronomical methods, planning and acquiring observations, modeling, and data analysis and forming rational conclusions.
• Awareness of astronomical phenomena.
• Demonstrate ability to follow directions to complete all coursework.
• Demonstrate ability to properly and safely use laboratory tools, e.g. calculator, computer, software, ruler, protractor, camera, telescope, maps, etc. to acquire, analyze and simulate data.
• Write accurately & meaningfully in analyzing experiments, both qualitatively and quantitatively.
• Coursework roughly parallels the material in the AST101 lecture course.
• Lab Exercises constitute the majority of work in this course. They “work” like this:
  o Exercises are begun in class.
  o Exercises may be completed during scheduled class meetings, or Out-Of-Class.
  o An Exercise or Class Meeting may be shifted to another day/time or to an outdoor location, depending on astronomical events and other considerations.
• All course work must be submitted on or before the announced due dates.
• Teamwork is the norm in astronomy, and is emphasized in this course as follows.
  o Quizzes and the Final Exam receive individual scores.
  o Student teams work effectively in collaborative groups to complete Lab Exercises.
  o Teams set their own work/break schedule to complete each exercise.
  o Each student submits individual Lab Exercises & receives individual scores.

Attendance: You are expected to attend each class meeting. Missing class impacts the student and the teams, especially in a course meeting once-per-week. If a student is absent more than twice, the Instructor may immediately withdraw the student without additional notification.

NOTE: Once withdrawn from class, a student will NOT be readmitted!!

Withdrawal Policy: SCC establishes a FIRM last day to self-withdraw, and a separate FIRM last day for Instructor-approved withdrawal from the course. Please do NOT withdraw yourself without first seeking advice from me or from Counseling Services. More positive options are often available to you!
Cell Phones and Pagers: Use of a cell phone is **not allowed** inside the classroom, including for calculations! **Turn off all audio alerts** for your cell phone, PDA, etc. in the classroom.

Classroom Discipline (see Catalog, Handbook & Syllabus Supplement): All students are expected to know & comply with all current published policies, rules & regulations in the current college Catalog, Class Schedule, and Student Handbook. Disciplinary actions may be imposed for misconduct or violation of law and/or college rules & policies, including plagiarism, profanity, or disruptive conduct.

Safe and Positive Learning Environment: I fully endorse SCC’s policy of establishing the classroom as a safe space and a safe learning environment for every individual. Therefore,
- Each student will be treated with respect.
- Each student will show respect to the instructor and every other student.
- **Disagreement does not constitute disrespect:** We all have different personal values, preferences, educational backgrounds, and experiences. To responsibly share different points of view benefits everyone, especially in a science course. However, each student must respect the rights and needs of fellow classmates, especially during discussions and in the planning and completion of the team-based exercises which are central to this course.

To establish a positive learning environment for this class:

As your Instructor, I will be professional, courteous, respectful, and empathetic to students, and:
- Begin and end class on time, Will be available for individual consultation.
- Be prepared for each class session,
- Clarify assignments and inform students of any adjustments to the class schedule,
- Provide academic feedback and score your assignments in a timely manner; and,

As a Student, you are expected to be reflective, courteous, respectful, and empathetic to your classmates, instructor, and other College staff assisting you in your learning, and to:
- Attend class & show up on time
- Be prepared for class meetings
- Participate in class activities
- Keep up with assignments
- Follow instructions & complete assignments
- Turn in assignments by the due dates
- Put forth your best effort

Communication: Communication is essential to your success in this class!
Communication occurs in class & via email & Canvas. Your OFFICIAL SCC email address is the ONLY one to be used for correspondence with all your Instructors (including this class).

If you plan to use a personal email address, please configure your MCCCD email to immediately forward MCCCD emails to your personal email system.

If a significant issue or concern arises, please see me before it becomes a problem! Other resources/options may well be available to assist you, e.g., regarding:
- Tutoring (math, science, writing skills)  
- Coursework Assistance
- Decision to withdraw from the course

Student Support Services: (See Catalog and Handbook) Are Free Of Charge to all registered SCC students. Confidential assistance & workshops (e.g., study skills, note-taking, time management, test-taking strategies, math/science/test anxiety); goal setting; success strategies; and career exploration) are available at Counseling Services (SC108, by Advisement).
**Academic Accommodations:** The Maricopa County Community College District will not discriminate on the basis of disability in the application, admission, participation, access or treatment of persons in any instructional program or activity. Students who believe they may need special accommodations in this course should contact Disability Resources & Services (SC144; 480-423-6517). I am very willing to provide reasonable accommodations to students with disabilities, per DRS instructions.

**GRADING:** Each AST102 student receives an individual Letter Grade determined by total score points earned on: Lab Exercises, Assessments, External Observing, and the Course Notebook.

<table>
<thead>
<tr>
<th>Activity</th>
<th>#</th>
<th>Point Value</th>
<th>% Value</th>
<th>Total Possible Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory Exercises</td>
<td>12</td>
<td>@ 50 points</td>
<td>60%</td>
<td>600 points</td>
</tr>
<tr>
<td>Course Notebook</td>
<td>3</td>
<td>@ 20 points</td>
<td>6%</td>
<td>60 points</td>
</tr>
<tr>
<td>Constellation Quiz</td>
<td>1</td>
<td>@ 100 points</td>
<td>10%</td>
<td>100 points</td>
</tr>
<tr>
<td>Off-campus Observing Session</td>
<td>1</td>
<td>@ 50 points</td>
<td>05%</td>
<td>50 points</td>
</tr>
<tr>
<td>Interim Quiz</td>
<td>1</td>
<td>@ 50 points</td>
<td>05%</td>
<td>50 points</td>
</tr>
<tr>
<td>Final Exam</td>
<td>1</td>
<td>@ 200 points</td>
<td>20%</td>
<td>200 points</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td></td>
<td></td>
<td></td>
<td>1,060 points</td>
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Approximate guidelines for letter grades are:

- **A:** 900+ points
- **B:** 800-899 points
- **C:** 700-799 points
- **D:** 600-699 points
- **F:** <600 points

The grading scale will not be raised, but could possibly be lowered slightly.

There is no "Extra Credit" in this Class. However, there MAY be opportunity(ies) for ALL students to earn "Incentive Credit" by accomplishing instructor-specified efforts out of class. Example Qualifying class event(s) might include, e.g.: comet, eclipse, lecture, etc.

**Laboratory Exercises** are provided to students. All Exercises are begun in class. Some Labs require completing portions out of class. To receive Exercise credit, a student must be present in class when an exercise is performed! Please review next week’s topic in your textbook before class; be prepared to discuss it & ask relevant questions before starting the Exercise! You can make up ONE **missed Indoor or Indoor/Outdoor lab at the Make-Up Lab class.** Value: 60% of course grade.

**Course Notebook:** ALL Lab Exercises are submitted in the Course Notebook. The Notebook is scored for format, content, & Learning Reflections. Value: 6% of course grade.

**Constellation Quiz:** Class meeting at which each student individually points out prominent stars, constellations, planets, & other celestial objects of the season. Value: 10% of course grade.

**Off-campus Observing Session:** Assignment to attend a nighttime Observing Session off-campus and document your observations. Details will be posted online. Value: 5% of course grade.

**Interim Quiz:** ONLINE Quiz to prepare you for the Final Exam. Students must take this Quiz between assigned dates/times or receive a ZERO score. Value: 5% of course grade.

**Final Exam:** A comprehensive, individual exam held at the last class meeting. A Scientific Calculator is Required. No Sharing Anything. **There will be NO make-up Final Exam!** Value: 20% of course grade.