Astronomy Merit Badge

OC BSA Council Online MB Program

Welcome to the Astronomy Merit badge course. This course will be held online through face to face Zoom sessions as well as completed through independent homework. Please read this syllabus in its entirety. You must virtually sign off that you have read this document on Google Classroom before you start this course.

**Prerequisites**

* Must be between ages: 11- 17

**Google Classroom code:**

**Materials needed:**

* Digital or hard copy of the Astronomy Merit Badge workbook (MBWB)
  + <http://usscouts.org/usscouts/mb/worksheets/Astronomy.pdf>
* You are expected to take notes, fill out descriptions and explanations while instruction is going on. **At the end of this course you must turn in your MBWB to receive credit for the Astronomy Merit Badge.** 
  + **All written or drawn work must be included either in or with your MBWB to receive credit**
  + You may either turn in your online document as a PDF or Document **OR** take clear pictures of your hard copy.
* Pen/pencil **OR** the capability to type notes online. **Handwriting must be legible to receive credit.**
* A camera or phone with the capability to take photos in order to satisfy certain requirements.
* **Recommended**:

**Note for partial completement:** Requirement 8 will not be completed in this session. Scouts are required to complete this requirement later.

Pre-Requirements and Research:

* Look over the syllabus and requirements
* Make sure to do any prior research needed
* Have your MB workbook – we will be working out of this and you will turn this in at the end

Be familiar with requirements 1 and 3 before the first zoom meeting

**Schedule:**

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| --- | --- | --- | --- |
|  | **Date** | **Start Time** | **Description** |
| **Session 1**  **ZOOM** | - | -(1.5 hours) | Overview/ Introduction – introduce ourselves and the merit badge  Requirement 1   1. In class, scouts will go over the most likely hazards you may encounter while participating in astronomy activities, and what you should do to anticipate, help prevent, mitigate, and respond to these hazards. 2. Scouts will go over first aid for injuries or illnesses such as heat and cold reactions, dehydration, bites and stings, and damage to your eyes that could occur during observation. 3. Scouts will describe the proper clothing and other precautions for safely making observations at night and in cold weather. Then explain how to safely observe the Sun, objects near the Sun, and the Moon.   Requirement 3   1. Scouts will go overwhy binoculars and telescopes are important astronomical tools. Demonstrate or explain how these tools are used. 2. Scouts will describe the similarities and differences of several types of astronomical telescopes, including at least one that observes light beyond the visible part of the spectrum (i.e., radio, X-ray, ultraviolet, or infrared). 3. Scouts will go over the purposes of at least three instruments used with astronomical telescopes. 4. Scouts will describe the proper care and storage of telescopes and binoculars both at home and in the field. |
| **Session 1 HW** | - | -(1-2 hours) | Start on Requirement 4. (Will be covered in Session 3, so you can do this at any point until then)   * Create written log of your observations:  1. Identify in the sky at least 10 constellations, at least four of which are in the zodiac. 2. Identify in the sky at least eight conspicuous stars, five of which are of magnitude 1 or brighter. 3. Make two sketches of the Big Dipper. In one sketch, show the Big Dipper's orientation in the early evening sky. In another sketch, show its position several hours later. In both sketches, show the North Star and the horizon. Record the date and time each sketch was made. 4. Research what we see when we look at the Milky Way. Be prepared to explain.   Requirement 2   1. Research and write 3-5 sentences answering the questions what light pollution is and how it and air pollution affect astronomy. Be prepared to explain.   Familiarize yourself with requirement 6 |
| **Session 2**  **Zoom** | - | -(0.5 - 1) | Requirement 6   1. In class, scouts will sketch the face of the Moon and indicate at least five seas and five craters. Label these landmarks. 2. In class, scouts will learn the phases of the moon. The rest of 6b will be done as homework. 3. Scouts will list the factors that keep the Moon in orbit around Earth. 4. With the aid of diagrams, scouts will go over the relative positions of the Sun, Earth, and the Moon at the times of lunar and solar eclipses, and at the times of new, first-quarter, full, and last-quarter phases of the Moon.   Review Requirements 2 and 4   * Go over homework assignments * Have discussions about a few of the topics * BE PREPARED TO SHARE! |
| **Session 2 HW** |  | -(2-3) | Finish Requirement 6b   1. Sketch the phase and the position of the Moon at the same hour and place, for four nights within a one week period. Include landmarks on the horizon such as hills, trees, and buildings. Be prepared to explain the changes you observe.   Requirement 8 (be prepared to have to go to a planetarium to complete this requirement)   1. Visit a planetariums website and answer these questions:   (1) Activities occurring there  (2) Exhibits and displays you saw  (3) Telescopes and other instruments being used  (4) Celestial objects you observed  Familiarize yourself with Requirement 7  Send your Night Observation Log to counselor the day before the next Zoom session |
| **Session 3 ZOOM** |  | -(1-1.5 hours) | Requirement 7   1. Scouts will describe the composition of the Sun, its relationship to other stars, and some effects of its radiation on Earth's weather and communications. 2. Scouts will define sunspots and describe some of the effects they may have on solar radiation. 3. Identify at least one red star, one blue star, and one yellow star (other than the Sun). Explain the meaning of these colors.   Discuss Requirement 4 (SEE ABOVE FOR FULL REQUIREMENT)   * Send Night Observation log to counselor the day before this session  1. Discuss the 10 constellations 2. Discuss the conspicuous stars, five of which are of magnitude 1 or brighter. 3. Show your sketches to the group and counselor. Be prepared to explain your sketches. 4. Explain what we see when we look at the Milky Way. |
| **Session 3 HW** |  | -(1 hours) | Requirement 9   1. Written: Find out about three career opportunities in astronomy. Pick one and find out the education, training, and experience required for this profession. Be prepared to discuss this with your counselor and explain why this profession might interest you. |
| **Session 4**  **ZOOM** |  | -(1 hour) | Discuss Requirement 3  Talk about Requirement 8 (SEE ABOVE FOR REQUIREMENT) and how this will/should be accomplished on scout’s own  Wrap-Up |