

# Bucoco Merit Badge Academy

## Master Prerequisites List

### **First Aid**

1. Demonstrate to your counselor that you have current knowledge of all first-aid requirements for Tenderfoot, Second Class, and First Class ranks.

### **Emergency Preparedness**

Complete First Aid merit badge

### **Robotics**

1. Safety. Do each of the following:
  - (a) Explain to your counselor the most likely hazards you may encounter while working with robots and what you should do to anticipate, mitigate and prevent, and respond to these hazards. Describe the appropriate safety gear and clothing that should be used when working with robotics.
  - (b) Discuss first aid and prevention for the types of injuries that could occur while participating in robotics activities and competitions, including cuts, eye injuries, and burns (chemical or heat).
2. Robotics Industry. Discuss the following with your counselor:
  - (a) The kinds of things robots can do and how robots are best used today.
  - (b) The similarities and differences between remote-control vehicles, telerobots, and autonomous robots.
  - (c) Three different methods robots can use to move themselves other than wheels or tracks. Describe when it would be appropriate to use each method.
3. General Knowledge. Discuss with your counselor three of the five major fields of robotics (human-robot interface, mobility, manipulation, programming, sensors) and their importance to robotics development. Discuss either the three fields as they relate to a single robot system OR talk about each field in general. Find pictures or at least one video to aid your discussion.
6. Competitions. Do ONE of the following.
  - (a) Attend a robotics competition and report to your counselor what you saw and learned about the competition and how teams are organized and managed.

(b) Learn about three youth robotics competitions. Tell your counselor about these, including the type of competition, time commitment, age of the participants, and how many teams are involved.

7. Careers. Name three career opportunities in robotics. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.

Note: It would be helpful if each scout uses the robotics merit badge workbook to document their research before coming to class.

### **Citizenship in Society**

1. Before beginning work on other requirements for this merit badge, research the following terms and explain to your counselor how you feel they relate to the Scout Oath and Scout Law: identities, diversity, equality, equity, inclusion, discrimination, ethical leadership, upstander.

### **Citizenship in the World**

7. Do TWO of the following (with your parent or guardian's permission) and share with your counselor what you have learned:

(a) Visit the web site of the U.S. State Department. Learn more about an issue you find interesting that is discussed on this web site.

(b) Visit the web site of an international news organization or foreign government, OR examine a foreign newspaper available at your local library, bookstore, or newsstand. Find a news story about a human right realized in the United States that is not recognized in another country.

(c) Visit with a student or Scout from another country and discuss the typical values, holidays, ethnic foods, and traditions practiced or enjoyed there.

(d) Attend a world Scout jamboree.

(e) Participate in or attend an international event in your area, such as an ethnic festival, concert, or play.

### **Communication**

3. Draft a 5 minute speech (it does not need to be a script; just an outline and/or ideas of what they would say in response to the topics) on any of the following topics of "how scouting impacts you and the community," "what scouting means to me," and/or "what do I want to be

when I grow up and why," In the past, I found scouts have trouble coming up with a topic so really these are suggestions. If they have something better, by all means great!

4. Interview someone they know and be prepared to discuss that individual as though they are being introduced.
5. Attend a public meeting (for proof, they can bring their notes or documents they got from the meeting)
7. (any one of the subsections) - Scout should be prepared to discuss what they did, and whether they got a response
8. Plan a troop activity; scout should bring their script, agenda, outline, etc. of what they did

## **Geocaching**

7. With your parent or guardian's permission\*, go to [www.geocaching.com](http://www.geocaching.com). Type in your city and state to locate public geocaches in your area. Share with your counselor the posted information about three of those geocaches. Then, pick one of the three and find the cache.

\*To fulfill this requirement, you will need to set up a free user account with [www.Geocaching.com](http://www.Geocaching.com). Before doing so, ask your parent for permission and help.

8. Do ONE of the following:

- (a) If a Cache to Eaglecode® series exists in your council, visit at least three of the locations in the series. Describe the projects that each cache you visit highlights, and explain how the Cache to Eaglecode® program helps share our Scouting service with the public.
- (b) Create a Scouting-related Travel Bug® that promotes one of the values of Scouting. "Release" your Travel Bug into a public geocache and, with your parent or guardian's permission, monitor its progress at [www.geocaching.com](http://www.geocaching.com) for 30 days. Keep a log, and share this with your counselor at the end of the 30-day period.
- (c) Set up and hide a public geocache, following the guidelines in the Geocaching merit badge pamphlet. Before doing so, share with your counselor a three-month maintenance plan for the geocache where you are personally responsible for those three months. After setting up the geocache, with your parent or guardian's permission, follow the logs online for 30 days and share them with your counselor. You must archive the geocache when you are no longer maintaining it.
- (d) Explain what Cache In Trash Out (CITO) means, and describe how you have practiced CITO at public geocaches or at a CITO event. Then, either create CITO containers to leave at public caches, or host a CITO event for your unit or for the public.

9. Plan a geohunt for a youth group such as your troop or a neighboring pack, at school, or your place of worship. Choose a theme, set up a course with at least four waypoints, teach the players how to use a GPS unit, and play the game. Tell your counselor about your experience and share the materials you used and developed for this event.

## **Archery**

Wear weather-appropriate clothing.

## **Fishing**

Prerequisites pending

## **Reptiles and Amphibians**

8. Do ONE of the following:

(a) Take custody of one or more reptiles or amphibians in a manner approved by your counselor. Maintain one or more reptiles or amphibians for at least a month. Record food accepted, eating methods, changes in coloration, shedding of skins, and general habits; or keep the eggs of a reptile from the time of laying until hatching; or keep the eggs of an amphibian from the time of laying until their transformation into tadpoles (frogs) or larvae (salamanders). Whichever you chose, keep records of and report to your counselor how you cared for your animal/eggs/larvae to include lighting, habitat, temperature and humidity maintenance and any veterinary care requirements. Unless you are the long-term owner, at the conclusion of this study, turn the animal(s) over to another responsible party approved by your counselor.

(b) Choose a reptile or amphibian that you can observe or foster at a local zoo, aquarium, nature center, local rescue, or other such exhibit (such as your classroom or school). Study the specimen weekly for a periods of three months. At each visit, sketch the specimen in its captive habitat and note any changes in its coloration, shedding of skins, and general habits and behavior. Discuss with your counselor how the animal you observed was cared for to include its housing and habitat, how the lighting, temperature, and humidity were maintained, and any veterinary care requirements. Find out, either from information you locate on your own or by talking to the caretaker, what this species eats and what are its native habitat and home range, preferred climate, average life expectancy, and natural predators. Also identify any human-caused threats to its population and any laws that protect the species and its habitat. After the observation period, share what you have learned with your counselor. COUNSELOR NOTE: It should not involve caring for a venomous reptile or amphibian (although if observed at a nature center with a safe habitat, that would be fine).

## **Railroading**

3. Do ONE of the following:

- (a) Name four departments of a railroad company. Describe what each department does.
- (b) Tell about the opportunities in railroading that interest you most and why.
- (c) Name four rail support industries. Describe the function of each one.
- (d) With your parent or guardian's and counselor's approval, interview someone employed in the rail industry. Learn what that person does and how this person became interested in railroading. Find out what type of schooling and training are required for this position.

7. Do ONE of the following special-interest options:

(a) Option A: Model Railroading

With your parent or guardian's and counselor's approval, do TWO of the following:

- (1) Draw a layout of your own model railroad or one that could be built in your home. Design a point-to-point track or loop with different routings. Include one of the following: turnaround or terminal or yard or siding.
- (2) Build one model railroad car kit or one locomotive kit.
- (3) Name the scale of four popular model railroad gauges. Identify the scale of four model cars or locomotives.
- (4) Locate the Web site of four model railroad - related manufacturers or magazine publishers. Print information on their products and services and discuss the information with your counselor.
- (5) Build one railroad structure (from scratch or using a kit), paint and weather the structure, mount it on your layout or diorama, and make the surrounding area on a diorama scenic.
- (6) Alone or with others, build a model railroad or modular layout including ballast and scenery. Make electrical connections and operate a train. Describe what you enjoyed most.
- (7) Participate in a switching contest on a timesaver layout and record your time.
- (8) Explain the difference between powering and controlling a model railroad by using direct current, and powering and controlling a model railroad using digital command control.

(b) Option B: Railfanning With your parent or guardian's and counselor's approval, do TWO of the following:

(1) Visit a railroad museum, historical display, or a prototype railroad sponsored public event. With permission, photograph, digitally record, or sketch items of interest. Explain what you saw and describe your photos, sketches, or video.

(2) Purchase tickets and ride a scenic or historic railroad. Under supervision, photograph the equipment and discuss with your counselor the historic significance of the operation.

(3) Locate the Web site of four rail historical groups, then find information on the history of the rail preservation operations and purpose of each group. Talk with a member of one of the groups and find out how you might help.

(4) Plan a trip by rail between two points. Obtain a schedule and explain when the train should arrive at two intermediate points. Purchase the tickets and make the trip. Explain to your counselor what you saw.

## Digital Technology

### Requirement 1: Digital Safety

- Watch the [Personal Safety Awareness "Digital Safety" video](#) with a parent or guardian's permission.
- Be ready to share one or two things you learned.

### Requirement 2a: Technology Then & Now

- Talk to a parent, grandparent, or other adult about what technology was like when they were your age.
- Be prepared to share how their experiences compare to your own.

### Requirement 5b: Using Search Engines

- Use a search engine (with permission) to find ideas from at least three websites about how to conduct a troop court of honor or campfire program.
- Bring your notes or be ready to explain how you conducted your search and what you found.

### Requirement 6: Complete THREE Digital Projects

Scouts must complete THREE of the project options listed under Requirement 6 and come prepared to show and discuss their work:

- (a) Using a spreadsheet or database program, develop a food budget for a patrol weekend campout OR create a troop roster that includes the name, rank, patrol, and telephone number of each Scout. Show your counselor that you can sort the roster by each of the following categories: rank, patrol, and alphabetically by name.
- (b) Using a word processor, write a draft letter to the parents of your troop's Scouts, inviting them to a troop event.

- (c) Using a graphics program, design and draw a campsite plan for your troop OR create a flier for an upcoming troop event, incorporating text and some type of visual such as a photograph or an illustration.
- (d) Using a presentation software program, develop a report about a Scouting topic. For your presentation, create at least five slides, with each one incorporating text and some type of visual such as a photograph or an illustration.
- (e) Using a digital device, take a picture of a troop activity. Send or transfer this image to a device where it can be shared with your counselor.
- (f) Make a digital recording of your voice, transfer the file to a different device, and have your counselor play back the recording.
- (g) Create a blog and use it as an online journal of your Scouting activities, including group discussions and meetings, campouts, and other events. Include at least five entries and two photographs or illustrations. Share your blog with your counselor. You need not post the blog to the internet; however, if you choose to go live with your blog, you must first share it with your parent or guardian AND counselor AND get their approval.
- (h) Create a webpage for your troop, patrol, school, or place of worship. Include at least three articles and two photographs or illustrations. Include at least one link to a website of interest to your audience. You need not post the page to the internet; however, if you decide to do so, you must first share the webpage with your parent or guardian AND counselor AND get their approval.

Scouts should bring their completed work to class. Electronic copies can be:

- Loaded on a USB Flash Drive
- Brought on your own device
- Emailed to me in advance at [Scoutmaster@Troop457Zelie.org](mailto:Scoutmaster@Troop457Zelie.org) (Email submissions must include a parent or Troop adult copied on the message.)

If your file is too large to send via email, let me know via email and I will send you a link to a directory where you can upload your files.

#### Requirement 7c: Intellectual Property Case

- Find an article or report online (with permission) about a recent intellectual property legal case.
- Bring a summary or printout to discuss in class.

#### Requirement 8: Sustainability

- Research a digital device recycling organization
- Be ready to explain what you learned about how electronic waste is handled.

## Environmental Science

### **2. Ecology. Do the following and discuss with your counselor:**

(a) Choose an area approved by your counselor and observe (sight, sound, and smell) its ecosystem over a two-day period.

(b) Make notes about the living, nonliving (e.g. rocks) and formerly living components. Include information about interactions among the components, including the food chain, predators, native species, and invasive species) and identify how human activities have affected the ecosystem.

### **6. Rare, Threatened, or Endangered Species. Do ONE of the following and discuss with your counselor:**

(a) Do research on one endangered species found in your state. Learn about its natural habitat, why it is endangered, what is being done to preserve it, and how many individual species are left in the wild. Prepare a 100-word report about the species and include a drawing or photo. Present your report to your patrol or troop.

(b) Do research on one species that was endangered or threatened but that has now recovered. Learn about how the species recovered, and what its new status is. Prepare a 100-word report on the species and include a drawing or photo. Present your report to your patrol or troop.

(c) With your parent or guardian and counselor's approval, work with a natural resource professional to identify a completed project that has been designed to improve the habitat for a threatened or endangered species in your area. Visit the site and report on what you saw to your patrol or troop.

## Cooking

2c. Track your daily level of activity and your daily caloric need based on your activity for five days. Then, based on the MyPlate food guide, discuss with your counselor an appropriate meal plan for yourself for one day .

4a. Using the MyPlate food guide or the current USDA nutrition model, plan menus for three full days of meals (three breakfasts, three lunches, and three dinners) plus one dessert. Your menus should include enough to feed yourself and at least one adult, keeping in mind any special needs (such as food allergies) and how you keep your foods safe and free from cross-contamination. List the equipment and utensils needed to prepare and serve these meals.

4b. Find recipes for each meal. Create a shopping list for your meals showing the amount of food needed to prepare for the number of people you will serve. Determine the cost for each meal.

5-(a) Using the MyPlate food guide or the current USDA nutrition model, plan a day of meals for trail hiking or backpacking that includes one breakfast, one lunch, one dinner, and one snack. These meals must consider weight, not require refrigeration and are to be consumed by three to



five people (including you). List the equipment and utensils needed to prepare and serve these meals.

5-(b) Create a shopping list for your meals, showing the amount of food needed to prepare and serve each meal, and the cost for each meal.

6a. Using the MyPlate food guide or the current USDA nutrition model, plan a menu that includes four meals, one snack, and one dessert for your patrol (or a similar size group of up to eight youth, including you) on a camping trip. These four meals must include two breakfasts, one lunch, and one dinner. Additionally, you must plan one snack and one dessert. Your menus should include enough food for each person, keeping in mind any special needs (such as food allergies) and how you keep your foods safe and free from cross-contamination. List the equipment and utensils needed to prepare and serve these meals.

6b. Find or create recipes for the four meals, the snack, and the dessert you have planned. Adjust menu items in the recipes for the number to be served. Create a shopping list and budget to determine the per-person cost.

### **Rifle Shooting**

Students bring binoculars. Wear weather appropriate clothing

### **Space Exploration**

5. Do TWO of the following:

(a) Discuss with your counselor a robotic space exploration mission and a historic crewed mission. Tell about each mission's major discoveries, its importance, and what was learned from it about the planets, moons, or regions of space explored.

(b) Using articles from the internet, photographs and text, create a blog, website, or slide show about a current planetary mission or use magazine photographs, news clippings, and articles from the internet to make a scrapbook about a current planetary mission.

(c) Design a robotic mission to another planet, moon, comet, or asteroid that will return samples of its surface to Earth. Name the planet, moon, comet, or asteroid your spacecraft will visit. Show how your design will cope with the conditions of the environments of the planet, moon, comet, or asteroid.

### **Aviation**

**4. Airport Operations. Do ONE of the following:**

(a) Visit an airport. After the visit, report on how the facilities are used, how runways are numbered, and how runways are determined to be "active."

(b) Visit a Federal Aviation Administration facility: Airport Traffic Control Tower (ATCT), Terminal Radar Approach Control (TRACON), Air Route Traffic Control Center (ARTCC),

or Flight Standards District Office (FSDO). Report on the operation and your impressions of the facility.

(c) Visit a military aviation facility. Learn how that facility supports defense and/or civilian activities. Report on the operation and your impressions of the facility.

(d) Visit an aviation museum or attend an air show. Report on your impressions of the museum or show, and what you learned from the experience.

**5. Personal & Professional Aviation Opportunities. Do the following:**

(a) Explain the following: the student pilot, the recreational pilot, the remote pilot, and the private pilot certificates.

(b) Describe the benefits of the instrument rating.

(c) Explain the following: the commercial pilot certificate, the airline transport pilot certificate, and certified flight instructor (CFI).

(d) Identify an Exploring Post and/or Civil Air Patrol facility in your area. Learn about their activities and membership requirements.

(e) Identify three career opportunities that would use skills and knowledge in aviation. Pick one and research the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.

## **Horsemanship**

All participants must fill out the [participant packet](#) for the stable facility and bring it with them to class.

For the second day of the class everyone is required to wear long pants (preferably jeans) and close-toed shoes with preferably with some form of heel. Helmets are provided by the stable.