



SCOUTMASTER BUCKY

Robotics Merit Badge

SCOUTS PARTICIPATING IN A SCOUTMASTER BUCKY MERIT BADGE OPPORTUNITY (ONLINE OR IN PERSON), PLEASE CONSIDER ALSO USING THE ROBOTICS MERIT BADGE CLASS PREPARATION PAGE FOR CLARIFICATIONS, INSIGHTS, AND EXPECTATIONS.

<https://scoutmasterbucky.com/merit-badges/robotics/robotics-cpp.pdf>

ROBOTICS MERIT BADGE WORKBOOK

REQUIREMENT 1a: 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.

HAZARD #1

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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HAZARD #2

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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HAZARD #3

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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HAZARD #4

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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HAZARD #5

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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HAZARD #6

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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REQUIREMENT 1a: Describe the appropriate safety gear and clothing that should be used when working with robotics.

Notes:

REQUIREMENT 1b: 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).

Cuts:

Eye Injuries:

Burns (chemical and heat):



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REQUIREMENT 2a: Discuss the kinds of things robots can do and how robots are best used today with your counselor.

Notes:



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REQUIREMENT 2b: Discuss the similarities and differences between remote-control vehicles, telerobots, and autonomous robots with your counselor.

Notes:



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REQUIREMENT 2c: Discuss three different methods robots can use to move themselves other than wheels or tracks. Describe when it would be appropriate to use each method with your counselor.

Method #1:

when appropriate to use:

Method #2:

when appropriate to use:

Method #3:

when appropriate to use:



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REQUIREMENT 3:

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.

Human-Robot Interface:

Mobility:

Manipulation:



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Programming:

Sensors:

Notes:



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REQUIREMENT 4a: With your counselor's approval, choose a task for the robot or robotic subsystem that you plan to build. Include sensor feedback and programming in the task. Document this information in your robot engineering notebook.

COUNSELOR APPROVAL: PERHAPS IMPLIED, THIS REQUIREMENT DOES NOT STATE THAT YOU NEED THE COUNSELOR'S APPROVAL AHEAD OF TIME TO WORK ON DESIGNING AND BUILDING YOUR ROBOT. PLEASE NOTE, AS WITH ANY REQUIREMENT, ACCEPTANCE IS AT THE DISCRETION AND SATISFACTION OF THE MERIT BADGE COUNSELOR.

Selected Task for Robot or Robotic System:

Counselor's Name

Phone

Counselor's Signature

Date

approved

REQUIREMENT 4b: Design your robot. The robot design should use sensors and programming and have at least 2 degrees of freedom. Document the design in your robot engineering notebook using drawings and a written description.

REQUIREMENT 4c: Build a robot or robotic subsystem of your original design to accomplish the task you chose for requirement 4a.

REQUIREMENT 4d: Discuss with your counselor the programming options available for your robot. Then do either option 1 OR option 2.
Option 1. Program your robot to perform the task you chose for your robot in 4a. Include a sample of your program's source code in your robot engineering notebook.
Option 2. Prepare a flowchart of the desired steps to program your robot for accomplishing the task in 4a. Include procedures that show activities based on sensor inputs. Place this in your robot engineering notebook.

REQUIREMENT 4e: Test your robot and record the results in your robot engineering notebook. Include suggestions on how you could improve your robot, as well as pictures or sketches of your finished robot.

All of these requirement components clearly states to document your information in your Robot Engineering Notebook. Consider using the Scoutmaster Bucky Robot Engineering Notebook to aid you.

Make sure you have your Robot Engineering Notebook completed and ready for your counselor to review.

ONLINE CLASS: The instructor / counselor will accommodate review of any Scout's work on Requirement 4 during the class, however it must be noted that NO class time will be allotted for working on Requirement 4

IN-PERSON CLASS: There will be class time allotted for Requirement 4, however no guarantee of completion of any or all components of Requirement 4 can be made as these components can each take a good amount of time. The instructor / counselor will provide means for completing any unfinished requirement components at the class.

This requirement must be reviewed with your merit badge counselor.



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REQUIREMENT 5a: Demonstrate for your counselor the robot you built in requirement 4.

Don't forget to bring your robot to share with the merit badge counselor.

This requirement must be reviewed with your merit badge counselor.

BE PREPARED!

REQUIREMENT 5b: Share your robot engineering notebook with your counselor. Talk about how well your robot accomplished the task, the improvements you would make in your next design, and what you learned about the design process.

Don't forget to bring your Robot Engineering Notebook to share with the merit badge counselor.

This requirement must be reviewed with your merit badge counselor.

BE PREPARED!

DO ONE OF THE FOLLOWING (6A or 6B) FOR REQUIREMENT 6

REQUIREMENT 6a: Attend a robotics competition and report to your counselor what you saw and learned about the competition and how teams are organized and managed.

Robotics Competition:

Location and Date:

Notes:



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REQUIREMENT 6b: 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.

ROBOTICS COMPETITION #1:

Name of Competition:

Location and Date:

Type of Competition:

Time Commitment:

Age of Participants:

How Many Team Involved:

Notes:



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ROBOTICS COMPETITION #2:

Name of Competition:

Location and Date:

Type of Competition:

Time Commitment:

Age of Participants:

How Many Team Involved:

Notes:



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ROBOTICS COMPETITION #3:

Name of Competition:

Location and Date:

Type of Competition:

Time Commitment:

Age of Participants:

How Many Team Involved:

Notes:



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REQUIREMENT 7: Name three career opportunities in robotics.

Career Opportunity #1:

Career Opportunity #2:

Career Opportunity #3:

REQUIREMENT 7: Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor.

Selected Career Opportunity:

Educational Requirements:

Training Requirements:

Experience Requirements:

REQUIREMENT 7: Explain why this profession might interest you.

Notes: