

# Robotics

Requirements revised: 2011  
Worksheet updated: June 2017

It is important to read the merit badge book and to do all the requirements for the merit badge. The merit badge worksheet is a good tool, to help ensure that you accomplish all the requirements.

Please bring the merit badge book, merit badge card, worksheet, and all your work with you to Merit Badge Day.

## **Remember the Scout Motto and BE PREPARED**

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 in your discussion.
4. **Design, build, program, test.** Do each of the following:
  - a. 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.
  - b. 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.
  - c. Build a robot or robotic subsystem of your original design to accomplish the task you chose for requirement 4a.
  - d. Discuss with your counselor the programming options available for your robot. Then do either option 1 OR option 2.
    - (1) 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.
    - (2) 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.
  - e. 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.
5. **Demonstrate.** Do the following:
  - a. Demonstrate for your counselor the robot you built in requirement 4.
  - b. 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.

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.