

Robotics



1. Define the following terms:
 - a. Robotics
 - b. Automation
2. Briefly describe three examples on how the use of robotics and automation has made an impact on society.
3. Briefly describe the following tools:
 - a. Robotic control systems
 - b. Motion Control
 - c. Programmable Logic Controller (PLC)
4. Define computer vision. Give three practical examples of its use.
5. Describe and give an example of each of the following types of robotic motion:
 - a. Rolling
 - b. Swimming
 - c. Walking
 - d. Flying
 - e. Climbing
6. Describe what is used as a power source for most robotic applications.
7. Describe, draw, or show pictures of a ballbot.
8. List four advantages and four disadvantages of automation. Briefly describe each.
9. Define and give two practical illustrations on the following types of automation:
 - a. Home
 - b. Auto Manufacturing
 - c. Industrial
 - d. Mining
 - e. Retail
10. Become familiar with any FAA (or equivalent body) regulations governing the operation of robots (including drones) in your locality.
11. Discuss with a group the biblical context of the following texts as they relate to the field of automation and robotics:
 - a. Genesis 1:27
 - b. Psalm 139:14
 - c. Proverbs 1:1-7
 - d. 1 Corinthians 2:16
12. List and discuss the relevance of Isaac Asimov's three rules governing robots.
13. Research ideas on robotic construction projects. Based on your research, construct and successfully operate a robot from a kit.

Skill Level 1

New in 2016

Robotics, Advanced

1. Have the Robotics Honor.
2. Define the following terms:
 - a. Artificial Intelligence
 - b. Accelerometer Sensor
 - c. Compass Sensor
 - d. Infrared Seeker & Receiver
 - e. Gyroscopic Sensor
 - f. Ultrasonic Sensor
 - g. Autonomous Robot
 - h. Pneumatic
 - i. Hydraulic
 - j. Sound Sensor
 - k. Light Sensor
 - l. Touch Sensor or similar
 - m. Servo Motor
 - n. Color Sensor
 - o. Operating System
 - p. Remote Control
 - q. Gears
 - r. Torque
3. Research an existing Robotics Club or League and discuss the following:
 - a. What are the core values of a local robotics league in your region?
 - b. How do these core values correspond with being a good Christian?
4. Using a kit, build a robotic model from instructions. Program your robot to complete one of the following challenges:
 - a. Sort at least 3 items of 3 different colors
 - b. Sort at least 3 items of 3 different shapes
 - c. Sort at least 3 similar items of different sizes
 - d. Pick up and move an object from one point to another
 - e. Kick, throw, or push an object at a specific target
 - f. Navigate an obstacle course or maze
 - g. Pick itself up (used for climbing over objects that it is unable to drive over)
5. Design and build your own robotic model and program your robot to complete one of the following challenges (cannot be the same challenge as completed in previous requirement):
 - a. Sort at least 3 items of 3 different colors
 - b. Sort at least 3 items of 3 different shapes
 - c. Sort at least 3 similar items of different sizes
 - d. Pick up and move an object from one point to another
 - e. Kick, throw, or push an object at a specific target
 - f. Navigate an obstacle course or maze
 - g. Pick itself up (used for climbing over objects that it is unable to drive over)
6. Choose one of the following:
 - a. Use your robotic model as a visual aid in a Children's Story for youth ages 2-9 at church or Sabbath School class.
 - b. Use your robotic model as part of a school project.
7. Write a 250 word paragraph, or give a 3-5 minute presentation to your group or club, explaining how you can use Robotics to witness to those that don't know about God.

8. Review Asimov's governing rules of robots and discuss if creating robots is usurping God's creative prerogative with regard to sentient beings.
9. Complete one of the following:
 - a. Join an existing Robotics Club.
 - b. Start a Robotics Club.
 - c. Visit a Robotics Club for one of their competitions.
 - d. Interview a member of a Robotics Club in person, by phone, email, or internet via video software.

Skill Level 2

New in 2016