

Robotics!

The concept of using mechanism and a power source to complete an autonomous task dates back to almost 300 years BC. Today's robots use sophisticated computers, sensors, mechanics and power sources to complete tasks that range from a simple line-following racecar to six wheeled robots traversing the surface of Mars. This badge focuses on the components and control methods that go into the design and construction of a robotic device.

Requirements (Check when complete):

This section focuses on the philosophy behind the use of robotic devices.

Do EACH of the following and submit to your instructor:

- In your opinion, identify and describe the fundamental reason for the design, construction and use of robotic devices
- Identify and describe how robotic devices have changed over the past 1000 years.
- Identify and describe how robotic devices have not changed over the past 1000 years.

This section focuses on the use of robotics in our world today.

Do EACH of the following and submit to your instructor:

- Identify and describe FOUR uses of robotic technology in today's world
- Identify and describe FOUR methods in which robotic technology emulates human behavior
- Identify and describe FOUR methods in which robotic technology does not emulate human behavior
- In your opinion, identify and describe how you think robotic technology is going to evolve from where it is today

This section focuses on the power components used in a robotic device.

Do EACH of the following and submit to your instructor:

- Identify and describe THREE different sources of power a robotic device uses to operate
 - Compare and contrast the THREE
- Identify and describe the limitations due to power faced by wireless (tether free) robotics
 - Identify and describe THREE means in which wireless robotics can be recharged
 - Identify and describe why this is important to robotic autonomy
- Identify and describe the differences between Electrical, Hydraulic and Pneumatic power for achieving robotic motion

This section focuses on the types of actuation used in a robotic device.

Do EACH of the following and submit to your instructor:

- Identify and describe THREE types of rotary actuators and how they used for achieving robotic motion
 - Compare and contrast the THREE
- Identify and describe THREE types of linear actuators and how they used for achieving robotic motion
 - Compare and contrast the THREE

Robotics!

This section focuses on the types of locomotion used to propel a robotic device.

Do EACH of the following and submit to your instructor:

- Identify and describe SIX types of locomotive devices and how they used for achieving robotic motion
- Compare and contrast the SIX

This section focuses on the types of sensors used in a robotic device.

Do EACH of the following and submit to your instructor:

- Identify and describe the rationale behind improving robotic devices autonomy through the use of sensors
- Identify and describe SIX types of sensors and how they used for supplying feedback to the robotic device
- Compare and contrast the SIX

This section focuses on the types of sensors used in a robotic device.

Do the following and submit to your instructor:

- Using a robotic building platform of your choice, construct a robot that demonstrates at least TWO articulated motions, mobility and FOUR types of sensors. (i.e. LEGO Mindstorms, Fischertechnik, Lynxmotion)