Team Brief™

Intelligent Systems Rotation 1, Interval 2
Sensory Imaging Segment 2

Attention captains! Have each member of your Suite Team read aloud one of the following paragraphs of the Robotic Limb challenge. Then, answer the questions together.

1. The Suite Team will be responsible for putting together a proposal on a prototype of a robotic limb.
2. Each Suite Team member should complete this Team Brief by working together at the team table. Keep your completed Team Brief in your student portfolio for reference while you are completing the team challenge during Interval 3.
3. You will complete a proposal including the information you gathered on this Team Brief. The proposal should include all items that address your robotic limb. Your completed proposal will be presented during Interval 4.
4. You and your Suite Team will complete a prototype of your robotic limb and its many elements for use in your presentation during Interval 4.
5. Each Harbor will work on a different portion of the prototype as indicated in this Team Brief.
6. In preparation for your presentation and proposal, please read the team challenge and answer the following questions. You may also refer to any of the books in your Harbor libraries for additional information.

Challenge: *Robotic Limb*

Your Suite Team has been hired by a prominent medical company to design and develop a prototype of a robotic limb. The robotic limb, if chosen, would be a model for future bionic development.

You don't need to build the entire limb for the presentation. The company only wants to see a part of the limb to determine if you can do the job. The limb will have joints, fingers or toes, and anything else that best explains its abilities. Choose one or more of these parts for your prototype and presentation. If the robotic limb is a success, the company plans to sell the limb to prosthetic suppliers for sale to hospitals nationwide. Keep this in mind as you develop your prototype. Use the backside of these pages for sketches when necessary.

Questions:

1. What kind of robotic limb will you be designing and what components will you build as a prototype to present to the medical company?

2. What kinds of joints and axes of motion will your prototype need?

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3. Describe the kind of manipulator(s) needed for your prototype. Explain what drive power(s) will be necessary.

4. Design and draw your robotic limb prototype.

5. Define the degrees of freedom necessary and the work envelope for your prototype. Sketches may be helpful.

6. List the sensors you will use on the prototype and explain why you chose these sensors.

7. You will be building a model of your sensory imaging components. Use the space below to sketch the robotic limb sensors. Identify their location, function, sensory input, and actions to be performed.

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8. List the control system(s) the full robotic limb will need. Explain how the drive systems will work and any specific control features.

9. Explain how your prototype's control system will work. Select a single circuit that you will use in the prototype. Draw a schematic of your circuit.

10. What types of information will you want to give the producer about your prototype? Explain how it models the full robotic limb, and identify the key points for use in your written proposal.

11. List items that will be included in the final challenge documentation. Team captains will be responsible to gather all of the challenge documentation from the other Harbors and to prepare them for the presentation of the challenge solution. Be sure to check each Harbor's Task List.

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