

ID	Activity	Description	Deliverables/ Checkpoints	Duration (days)	People	Resources	Predecessors
1	Create Solidworks Model	Create a computer model the is accurate to the real world prototype	A working, accurate 3D computer model, by the end of SD1	31	Casey, Andrew	SolidWorks Software Package	
1.1	Compile list of specifications	Get specification from the customers and past senior design teams so that the design can be integrated.		1	Casey, Andrew		
1.2	Concept Development	Ideas for solving design challenges, included air muscle size, motion imitation and scalability		10	Casey, Andrew		1.1
1.3	Initial Designs	Sketches and drawings of the parts	Design must meet the customer needs and be approved by the customer.	8	Casey, Andrew		1.2
1.3.1	<i>Find Air muscle components</i>	Use knowledge gained in past groups		1	Casey, Andrew		
1.3.2	<i>Find parts already available</i>	Need the CAD drawings of parts not going to be made.		2	Casey, Andrew		
1.3.3	<i>Sketches of developed concepts implimented</i>			5			
1.4	Solid Works Model	A CAD model of all the parts for the prototype, included past generation designs, that is exactly accurate to the real prototype to model the motion and control systems.		8	Casey, Andrew		1.3
1.4.1	<i>Make each part</i>			3	Casey, Andrew		
1.4.2	<i>Create part assemblies</i>			3	Casey, Andrew		
1.4.3	<i>Import other teams parts into overall model</i>			2	Casey, Andrew		
1.5	High Fidelity Model	The computer model must have the same material properties as the real prototype so that the mechanics can be test in the computer.	Final model must demonstrate the same characteristics as if it were made by real materials, including failure.	4	Casey, Andrew		1.4
1.5.1	<i>Add material properties to the model</i>			2	Casey, Andrew		
1.5.2	<i>Add boundary conditions to the model</i>			2	Casey, Andrew		
2	Build Arm Prototype	A simple prototype that demonstrates the designs for wrist, forearm and elbow motion.	A built, but untested, version of the arm by 3 weeks before Imagine RIT.	30		Money for parts and materials, machine shop time	1
2.1	Purchase Parts			1	Casey		2
2.2	Purchase Materials			1	Casey		
2.3	Machine Parts			15	Casey, Andrew		2.2
2.4	Assemble and Test Mechanical Parts			8	Casey, Andrew		2.3
2.4.1	<i>Assemble joints and test degrees of freedom</i>			3			
2.4.2	<i>Assemble, seperately, the air muscles</i>	The air muscles should be tested and have the characterstics understood.		3			
2.4.3	<i>Assemble all mechanical parts</i>			2			2.4.1, 2.4.2
2.5	Integrate and Test Circuitry			5	Team		2.4
3	Create Control Systems			60	AJ		
4	Interface Solidworks with Labview	Use labview's normal control system, but output to a Solidworks model instead of the physical hardwar.	Have the Solidworks model interface working exactly like the real works model my Imagine RIT.	15		Labview, interface package	1, 2
4.1	Learn to use Mechatronics Toolkit			2	Team		
4.2	Basic Implementation of Toolkit			5	Team		
4.3	Implement Toolkit for Wrist/Forearm/Elbow			4	Team		
4.4	Implement Toolkit for Entire Arm			4	Team		
5	Test and Debug Prototype	Time given to deal with challenges not seen in the design phase.	A working prototype by Imagine RIT Festival	13			1, 2
5.1	Test Basic Functions	Test that arm can move		10	Team		
5.1.1	<i>Test Wrist Motion</i>			3.3			
5.1.2	<i>Test Forearm Motion</i>			3.3			
5.1.3	<i>Test Elbow Motion</i>			3.3			
5.2	Test Accuracy to Human Motion	Test the arm movement is accurate		3	Team		5.1