Table Top Robots
A Suggested Program Timetable

Building a competitive BattleBots engineering team requires the development of skills and experiences over time. Design fabrication skills like machine tool skills, wiring, producing engineered drawings etc., are not unlike hitting, catching and shooting balls. These skills are developed over time by doing them repeatedly and for a purpose.

Table Top Robots is an exciting and engaging program of design, engineering and applied physics intended to motivate and prepare participants to meet the BattleBots design challenge. In addition participating students can and will achieve educational competencies described in the national and state curriculum frameworks for science/Engineering and technology education.

Table Top Robots
Suggested Curriculum Time Line

Wk	Engineering Class Lectures/Demos	CAD	Lab Work	Assignment	Instructor/Manager	Milestones
	Notebook Requirement Explained	Sketching and mockups	Shop safety and organization of materials/ Supplies	Create a notebook/web page or slide show folder to contain all documentation.	Prepare Lecture and lesson plan objectives.	
1	Resources Identified Design Process	3 View Theory	Using tools safely		Develop Kit Inventory/Parts Create storage and organization systems	Game Ideas reviewed

	Engineering Class Lectures/Demos	CAD	Lab Work	Assignment	Instructor/ Manager	Milestones
	Selecting and evolving ideas	Intro to CAD	Building Robot Dyno	Build a simple drive base	Develop Grading Criteria Develop game ideas	Game Defined Game Rules Playing field designed.
	BLEs and design evolution	Generating 3D Solids	Bench testing ideas/proving concepts		Prepare the fabrication area	Playing field constructed
	The Five Budgets: Time Money Weight Power Knowledge	Assigning and Drawing objects in the kit	Geartrains /Chains and pulleys	Personal power evaluation and spreadsheet	Create Motor, Battery and Pnuematics demo's	Game Rules Published
	Battery Basics and electrical fundamentals		Using Meters	Discharge and plot AA battery discharge curve. Calculate total energy output	Create testing modules for batteries/ motors and pneumatics	
	Evaluating Fixed Magnet DC Motors	Blocking virtual "Mock ups" with 3D solids			Create Electronics storage and battery Charging Stations	Labs Testing stations completed
	The Pneumatic System. Force pressure and controlling actuators			Motor assessment Measure motor armature resistance and calculate stall current		Drive system components engineered and parts drawn
	Analyze Servo Gear system. And servo torque. (need torque arm in kit)	Combinig objects and Designing Sub assemblies	Wiring connectors and soldering/	Using digital cameras or scans and words, document your module creations in your notebook	Create awards for winners	Functional or scoring components engineered and parts drawn.

	Engineering Class Lectures/Demos	CAD	Lab Work	Assignment	Instructor/Manager	Milestones
	Structural considerations using the kit components.			Reconfigure the servo. For 360 rotation. PWM Theory		Engineering drawings completed and in notebooks
	Wheel Strategies Track strategies Belts and pulleys (green cord)	Determine weights/volume	Fastening	Breadboard and operate the control system/sensors /speed controllers		
	Making Connections Wiring, batteries, motors and control systems	Dimensioning and detailing drawings				
	Controls system basics. Sensors and programming					
	WORK WEEK	WORK WEEK	WORK WEEK	WORK WEEK	WORK WEEK	WORK WEEK
				Journal complete		Machine built ready for test and debugging
			Competition Day	Students provide written commentary demonstrating what the learned and how the class benefited them.	Grading completed	Deconstruct Machine and Complete kit inventory and storage
						Debriefing