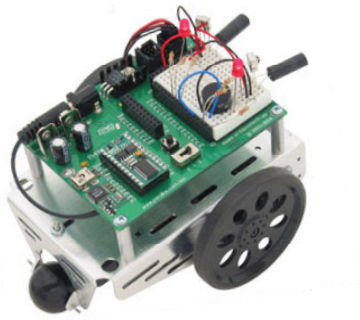
Parallax BASIC Stamp Educator's Course



Event Details

Date/Time
Monday – Tuesday
August 4 – 5, 2008
8:00 AM – 5:00 PM

Location
Tidewater Community College
Advanced Technology Center
Room (TBD)
1800 College Crescent
Virginia Beach, VA 23453

Contact Information

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Stamps in Class: www.stampsinclass.com
Parallax, Inc: www.parallax.com

Course Outline

Day #1 focuses on the design principles that go into most common digital devices with the BASIC Stamp Activity Kit and *What's a Microcontroller* text. Examples include programming a microcontroller, controlling indicator lights, servo motors, speaker tones and optionally LED displays, as well as monitoring pushbutton contact, dial position, and light levels.

	Topic	Concepts
Day #1		
8:30 AM	**Introductions**	Locating a work area, introductions setting up the BASIC Stamp hardware and software, introductions and course overview.
	Getting Started	*What's a Microcontroller* Chapter 1 - setting up your BASIC Stamp® HomeWork Board microcontroller prototyping platform, writing simple PBASIC programs with the BASIC Stamp Editor, downloading them to the BASIC Stamp and displaying diagnostic messages with the Debug Terminal.
	Lights On/Lights Off	*What's a Microcontroller* Chapter 2 – How indicator lights work, connecting indicator lights to the BASIC Stamp, and writing programs that make them blink at different rates for various numbers of repetitions.
	BASIC Stamp Customer Projects	Slides and videos show the use of BASIC Stamp microcontrollers around the world in industry, hobby, and space applications.
	Digital Inputs	*What's a Microcontroller* Chapter 3 – How pushbutton circuits work, connecting and testing pushbutton circuits, writing programs that make conditional decisions based on pushbutton inputs and control LEDs.
	Controlling Motion	Chapter 4 of *What's a Microcontroller.* How servos work, and how digital signals control their position. Write programs that make it possible to control servo position programmatically, with pushbuttons, and with your PC keyboard and the Debug Terminal.
Noon	**Lunch Break**	

Day #1 (continued)

	Measuring Rotation and Light	Reading potentiometer-type dials with the BASIC Stamp. (Chapter 5 of *What's a Microcontroller*.) Sensing light intensity with a photoresistor (Chapter 7 of *What's a Microcontroller*.)
	Parallax Educators Forum	Where to find solutions manuals and how to join.
	Frequency and Sound	Make sounds and play songs using a piezospeaker. Chapter 8 of *What's a Microcontroller.*

Day #2 focuses on the Boe-Bot robot and the *Robotics with the Boe-Bot* text, which are used by instructors worldwide to enhance robotics, pre-engineering, technology, electronics, and mechatronics courses. The Boe-Bot robot also provides a unique window into understanding the nuts and bolts of autonomous transportation technology. Day #2 of this workshop provides a hands-on introduction to the Parallax Boe-Bot and its applications in the classroom. All attendees will build, program, test, (and take home and continue to experiment with) their own autonomous Boe-Bot robot.

	Topic	Concepts
Day #2		
8:30 AM	**Questions / Answers**	Ask any questions about material on the first day.
	Get Started with the Boe-Bot Robot	Socket the BASIC Stamp into the Board of Education, connect it to the PC and test. Connect and center continuous rotation servos if time permits.
	Assemble the Boe-Bot	Build your Boe-Bot. Chapter 3 of *Robotics with the Boe-Bot*.
	Build the Low Battery Indicator.	Construct and test a piezospeaker battery indicator.
	Boe-Bot Navigation	Learn how to control the Boe-Bot to handle basic maneuvers with forward, backward, left and right. Chapter 4 of *Robotics with the Boe-Bot.*
Noon	**Lunch Break**	
	Tactile Navigation with Whiskers	Construct touch sensors for the Boe-Bot as shown in Chapter 5.
	Navigating with Infrared Headlights	Detect the presence of objects using infrared. Program the Boe-Bot to avoid objects. Chapter 7 of *Robotics with the Boe-Bot*.
	Robot Control with Distance Detection	Detect distance to an object. Use control systems to implement Boe-Bot Follow-the-Leader. See how many Boe-Bots will follow in a row. From Chapter 8.
Through 5:00 PM	**Open Session – Microcontroller Topics**	Try other sensors and microcontrollers. Options include: • A/D conversion with the ADC0831 • Temperature sensing with the DS1620 temperature sensor • Distance Detection with the Ping))) Ultrasonic Distance Sensor • Tilt detection with the Memsic 2125 Accelerometer module • Direction finding with the Hitachi HM55B Compass Module • Communicate with PC or other microcontrollers using RF modules • Display messages with the Parallax serial LCD • Measure signals with the Parallax USB Oscilloscope • Control a 7-segment LED using parallel I/O techniques • Get started with the SX Microcontroller • Get started with the amazing Propeller Microcontroller
Through 5:00 PM	**Open Session - Robotics Topics**	Try as many intermediate and advanced robotics applications as time permits, or try an optional activity from the first day's open session. Robotics options include: • Infrared remote control using a standard TV remote • Line following • Wireless robot control using 433 MHz RF transmitters and receivers • Navigation with the Ping))) Ultrasonic Rangefinder • Control your Boe-Bot with RF and the Memsic 2125 Accelerometer • Detect and climb hills with the Memsic 2125 Accelerometer • Remotely display robotic debugging information with the Parallax Serial LCD • Find the closest object with the Ping))) Ultrasonic Distance Sensor • Bluetooth robot communication and control with the eb500 Embedded Blue module