

K-12

Summer Camp 2009

www.egr.msu.edu/~aslam

# ROBOTICS & NANOTECHNOLOGY

MICHIGAN STATE UNIVERSITY

Innovative Micro and Nano Technology Short Courses for K – 12  
offered jointly by MSU, NSF WIMS ERC and Nanobrick

## UNIQUE LEARNING:

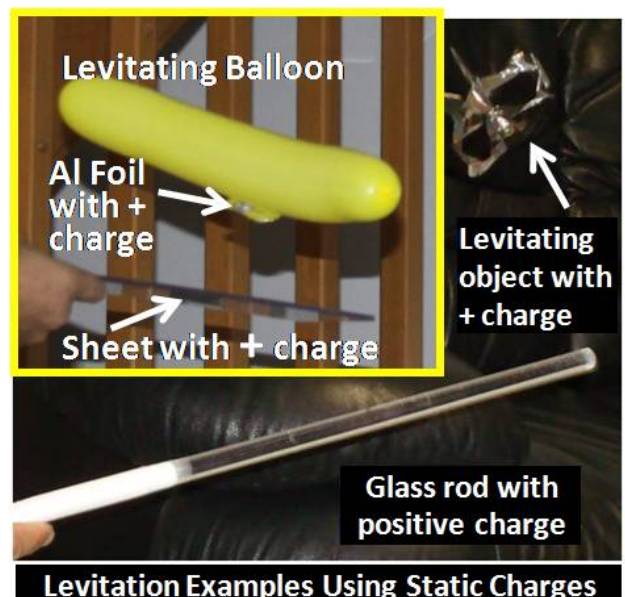
“We mix dry learning topics with Legos, drive them around with robots, levitate them in the air and shock them with static charges from Lego Van de Graaff generators.” Suddenly they become fun and everyone wants to learn them. In an innovative K – Ph.D. education and research program, developed at MSU, graduate and undergraduate students mentor K-12 students in hands-on Technology Assisted Science, Engineering and Mathematics (TASEM). The TASEM environment introduces micro and nano technologies to children in a very interesting and exciting manner.

## DURATION AND COST:

In 8-hour short-courses (spread over 4 days) designed for all levels of K-12, the children (typically 2 per group) learn basics, do one technology-assisted experiment, work on a project and present it to their parents and teachers. Each SC costs \$138.00 per student. Returning children will continue at a higher level. A child registered for multiple SCs will be moved to higher level after each course. All activities, with the exception of HD video, will involve programmable robots.

## WHAT IS NEW IN 2009?

- ☺ Levitating objects using static charges: Using everyday items, electrostatic levitation is used to create interest and fun in learning.
- ☺ Nanotechnology and static charges: Lego-based learning modules use a top-down approach to explain nanotechnology using fun experiments.



## Three Steps for Registration:

- 1 Select the area of learning: Multiple means no restrictions, all areas are offered in every short course

Learning Area	Learning Goals/Objectives	Grade	Stations	Groups/SC
Programmable Robots, RCX	Sensors, motors, gear trains, robot-building, -control & -programming, science, math & engineering concepts	K - 12	Multiple	Multiple
Programmable Robots, NXT	Sensors, motors, gear trains, robot-building, -control & -programming, science, math & engineering concepts	3 - 12	Multiple	Multiple
Microcontroller Programming	Programming in C, compiling C code & downloading into microcontrollers, building robots, system integration	8 - 12	4	4
Nanotechnology* Experiments	Learn about miniaturization & measurement, definition of nano, nanotechnology, soap bubbles & static charge	6 - 12	6	3
Static Charges*; Fun Experiments	Explain computer switches & gates, sensors, circuits, charge storage, build & program charge generators	K - 12	8	4
High Definition Video	Shooting & editing high definition video, video reporting	7 – 12	1	1

\* For 6-12 graders, the areas of nano and static charge will be combined.

**2 Select the SC # and date:** All areas are offered in every short course  
 The Short Courses (SC) 1, 3 and 5 are offered in the morning from 10:00 a.m. to 12:00 noon (Monday-Thursday). The SC # 2, 4 and 6 are offered in the afternoon from 1:00 to 3:00 p.m. (Monday-Thursday).

**For further information: contact Mrs. Zahida Aslam at [zahaslam@hotmail.com](mailto:zahaslam@hotmail.com) or Dean Aslam at [aslam@msu.edu](mailto:aslam@msu.edu) Website: [www.egr.msu.edu/~aslam](http://www.egr.msu.edu/~aslam)**

**Examples:** If the child is in grades 3-5, select the area of NXT robots. If the child is in grades K-5 select RCX robots. See Table on page 1 for details of recommended areas and grades.

SC #	1	2	3	4	5	6
Starts at	10:00 a.m.	1:00 p.m.	10:00 a.m.	1:00 p.m.	10:00 a.m.	1:00 p.m.
Dates	June: 6/15 - 6/18		June: 6/22 - 6/25		June/July: 6/29 - 7/2	
Location	225 Natural Resources; <b>parking structure available on Trowbridge</b>					
Deadline	Until filled, max. # per SC is 24 based on first-come-first-served, see website					

**3 Send Form and Check:**

Mail the registration form below and a check (\$138.00 per student) made out to 'Michigan State University', with the memo line filled in to Dr. Aslam:

Dr. Dean M. Aslam, Electrical and Computer Engineering, 2120 Engr. Bldg., Michigan State University, E. Lansing, MI 48824

**Registration Form**

Student Name: ..... Grade:.....Short Course #.....  
 Student Name: ..... Grade:.....Short Course #.....  
 Study Area: .....Previously Attended a SC? YES/NO<sup>1</sup>  
 Name of parents: .....Phone number:.....  
 Email Address:.....Special Requests, Food Allergies: .....

**Frequently Asked Questions:**

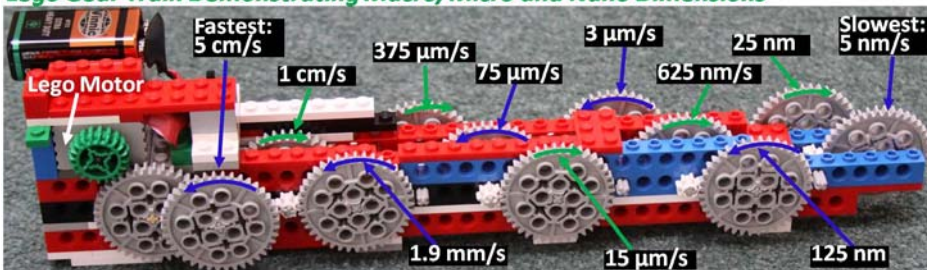
- Are all the learning areas taught during each short course?  
**Yes, all areas are available in each short course or session.**
- If my child registers for static charges, will he/she also learn about robots?  
**Yes, with the exception of HD video, all areas involve programmable robots.**
- If my child wants to take multiple courses in the Camp, how can he/she do that?  
**This is only possible by registering for multiple short courses.**
- If my child wants to take multiple courses in the same area, is that possible?  
**Yes, in this case the child will be elevated to higher level in every additional course. With the exception of HD Video, all areas have multiple levels (from very basic to very advance).**

This program is partly supported by the NSF ERC for Wireless Integrated Micro-Systems (WIMS) and by Nanobrick: [www.wimserc.org](http://www.wimserc.org)



FOR CAMPUS MAPS GO TO: <http://www.msu.edu/maps/index.html>

**Lego Gear Train Demonstrating Macro, Micro and Nano Dimensions**



<sup>1</sup> If yes, tell us what you have done so far in prior Camps with us or elsewhere (mention the previous years).