

# SPIRIT Summer Institute 2007

*Revisions as of July 16, 2007*

*Blue is CEEN, Red is Education, Purple is Both*

## Day 1      Monday July 9, 2007

- 0830 Coffee and Donuts  
Individual pictures taken through morning (SE)  
Surveys given as people enter (BS/JW)  
Distribution of Temporary Parking Permits (BS/JW)
- 0900 Workshop Objectives, Responsibilities and Introductions (BC, NG)
- 0930 Comments on Surveys, Questionnaires, Release Forms (NG)  
Surveys retrieved (BS/JW)
- 0945 The State of Engineering Education (BC)  
"Did You Know" video
- 1015 Break/Housekeeping – refreshments, restroom locations, phones, etc. (BC)
- 1030 Slide show - TekBot™ and CEEN (RDS)  
What teachers should know about the TekBot™? (RDS)  
How does the TekBot™ work?  
What are the different parts of a TekBot™?  
What are the important characteristics of a TekBot™?
- 1130 Lunch (Scott Conference Center) (PKI sponsorship?)
- 1230 Short Panel Presentation of three Cohort 1 Teachers (NG moderated)  
What can be done with the TekBot?  
What can be learned with the TekBot?  
Cody Elem. – Women in Engineering (DD)
- 1330 Hands-On (AG/Engineering Staff)  
Soldering 101 – Which end is hot? (short video from HD/KT)  
Solder a connection (PKI 305/311)  
Battery Tester Assembly and Experimentation
- 1530 Adjourn (directly from Labs)

**Day 2      Tuesday July 10, 2007**

- 0900 Announcements (BC/NG/HD) PKI 252 all morning  
Distribution of participant photos (SE)
- 0915 Participant Responsibilities for Lesson Creation / Timeline (NG)  
(Participant Contracts/Forms for Payments)
- 0945 Using an engineering notebook (HD)  
(distribution of engineering notebooks)
- 1000 Break
- 1015 Introduction to Engineering (HD/Engineering Faculty)  
Reflections: What is Engineering?  
Who cares?
- 1100 Breakout (Observations/Questions) (HD)  
What has engineering most affected about your day so far today?  
How many computers have you used today?
- 1130 Lunch
- 1230 What teachers should know about the TekBot™ (RDS)  
Resistors, Capacitors, Color Codes, Using DMM, Diodes, Transistors
- 1315 Hands-On (RDS/HD)(PKI 252)  
Measuring Resistance and Capacitance with the DMM  
Testing Diodes and Transistors with the DMM  
Distribution of materials and parts inventory (KT) PKI 343  
TekBot kits  
Toolkits  
Notebooks/Articles (notes (schematics (RDS), assembly  
instructions (RDS), engr profession (HD), battery tester))  
  
Assemble chassis (RDS HD KT) PKI 305/311
- 1530 Adjourn (directly from Labs)

**Day 3            Wednesday July 11, 2007**

- 0900 Welcome for the Day (BC/NG/HD and faculty)
- 0910 Lesson development requirements review/ graduate credit options (NG/BS)  
Sample Lesson Overview (NG/BS/Cohort 1 Teacher)  
Three Contexts: Assembling TekBot, Moving TekBot, Engineering Notebook
- 0930 The scientific method and the Engineering Process (HD) (PKI 252)  
Problem identification, Problem definition, Listing of constraints  
Brainstorming, Solution alternatives, Means/methods, ITERATION
- 1015 Da Vinci's Lost Robots (HD) (PKI 252)
- 1030 Break
- 1100 Simulation (in PKI 260) (RDS)
- 1200 Lunch
- 1300 Basics of the charger board (RDS) (PKI 252)
- 1330 Hands-on:  
Assembly and Part I installation of power board/battery charger (PKI 305/311)
- 1530 Adjourn (adjourn directly from labs)

**Day 4      Thursday July 12, 2007**

- 0900 Welcome for the Day (BC/NG/HD and faculty)
- 0915 The Importance of Engineering Education in the Schools (NG)  
Education Articles Distributed  
Cohort 1 Teacher Comments (Derrick, Susan, etc.)
- 0945 A Typical Day in Engineering: What do engineers do? (HD)  
The morning meeting: engineering work is teamwork.  
Brainstorming session  
Engineering logbook  
Estimation and hand calculations  
Computer usage
- 1030 Break
- 1100 Understanding DC electrical motors (AG)
- 1130 Measuring parameters / DC electrical motors (HD)
- 1200 Lunch
- 1300 Hands-on:  
Assembly and Part II installation of power board/battery charger/motor control  
board (PKI 305/311)
- 1530 Adjourn (adjourn directly from labs)

**Day 5**      **Friday July 13, 2007** *(includes morning/afternoon schedule swap)*

- 0900 Welcome for the Day (BC/NG/HD and faculty)
- 0915 Hands-On  
Series Resistors, current measurements, diameter measurements (RDS)
- 1015 Remote control assembly  
Testing the locomotion platform using the prewired remote
- 1200 Lunch
- 1300 Brainstorming TekBot Education Ideas (NG)  
Connecting TekBots to the Curriculum (Small Group Card Sort)
- 1400 Break
- 1415 Poster Session on Expanding Your TekBot ideas  
Participants post their ideas on a poster
- 1500 Participants look at other posters and add their ideas  
(Participants move around the room with sticky notes)
- 1530 Adjourn (adjourn directly from education activity)

**Day 6**      **Monday July 16, 2007**

- 0900 Welcome for the Day (BC/NG/HD and faculty)  
Math/Science/Technology Standards distribution (Neal)  
Lesson Plans Specifics distribution (Neal)  
Remind teachers of 5 minute sharing session on Friday
- 0915 Bill and Jim's Lesson Samples and Examples (Bill, Jim)
- 0945 Engineering Design Tools (HD)  
Objectives and Constraints  
Scheduling  
Technical Writing
- 1015 Breakout (Observations/Questions) (HD?)  
Is engineering for everyone in the 21<sup>st</sup> century?  
Who would be good at engineering?
- 1045 Break
- 1115 What teachers should know about the TekBot™ (HD)  
Sensors, Light, Force  
Sensors, Sound, Position
- 1200 Lunch
- 1300 Hands-On  
Assembly and Test of Analog Brain Board
- 1530 Adjourn (adjourn directly from labs)
- 1600 SPIRIT Staff Meeting

**Day 7            Tuesday July 17, 2007**

- 0900 Welcome for the Day (BC/NG/HD and faculty)
- 0915 “Ramp Demonstration” for TekBot Lessons Ideas (Bill/Jim/Neal)  
(Participants verbally contribute to ideas)  
Remind Teachers of Friday Sharing Session
- 1000 Break
- 1015 Robotics in the media presentation (BC)  
"Did You Know" video and breakout  
(Various movie/TV video segments/Great Robot Race)
- 1115 Breakout (Questions) (BC/HD)  
Where do you believe modern life and technology are taking us?  
Will engineering activities will help lead us toward an improved world?
- 1200 Lunch
- 1300 Hands-On – CEEN Lab Work on TekBots  
Completing needed modifications to TekBots in Labs
- 1530 Adjourn (adjourn directly from labs)

**Day 8**      **Wednesday July 18, 2007**

0900-1530    Cohort 1 (makeup and extensions)

0900    Announcements (NG/BC)  
      Cohort 1 Introductions (Cohort #1 Says Hello)

0930    Planning a TekBot Problem (Neal)  
      Teachers design a TekBot Problem  
      (Given ramps, stopwatches, materials list, etc.)

1000    Robots and Websites  
      Demonstration of Robotics-Related Websites (Elliott Ostler)

1030    Visit lab to see Cohort 1

1045    Break

1100    Modern Engineering Constraints (HD)  
      Manufacturability, Affordability, Reliability, Sustainability, Quality

1130    Engineering Disciplines (HD)  
      Civil, Mechanical, Electrical, Chemical, Industrial, BioX

1200    Lunch

1300    Experimenting with your TekBot (Neal)  
      (Teachers create various navigation exercises)  
      (Focus on navigating mazes, ramp exercises, springs, etc.)

*(or individual technical assistance in lab as needed by some teachers)*

1530    Adjourn (adjourn directly from experimentation exercise)



**Day 9            Thursday July 19, 2007**

- 0900    Announcements  
         Attendance check, making up sessions policies (NG))
- 0915    “Popsicle Stick Electronics” (Elliott Ostler)  
         Teachers experiment with supportive activities  
         (Groups continue to contribute to ideas)
- 1000    Break
- 1030    Recruiting of Women and Minorities into Engineering (AG)  
         Thoughts and Small Group Discussion
- 1130    Tour of PKI and viewing of Kuka Robot (AG)
- 1200    Lunch
- 1300    (Cohort 2) Head Start and Catch up Session for TekBots  
         • Tekbot repair and trouble-shooting  
         • Getting a start on building your 2nd TekBot
- 1300    (Cohort 1) Action Research Overview and Recruitment  
         • Action Research Discussion (NG/Mike Timms)  
         • Curriculum Review Opportunities (NG/Mike Timms)
- 1400    (Cohort 1) Action Research Planning  
         • Action Research Sign-up and Ideas Refinement
- 1530    Adjourn (adjourn directly from labs or action research)

**Day 10      Friday July 20, 2007**

- 0900 Announcements (NG/BC)  
Introduction of Guests (Cohort1/Mike Timms/others)
- 0915 Teacher 5 Minute Presentations on Their Lesson Ideas  
(Group Written Feedback and Suggestions)
- 1000 Break
- 1015 Teacher 5 Minute Presentations on Their Lesson Ideas  
(Group Written Feedback and Suggestions)
- 1200 Lunch
- 1300 Teacher 5 Minute Presentations on Their Lesson Ideas  
(Group Written Feedback and Suggestions)
- 1400 Overview of SPIRIT Next Steps and Fall Activities  
Closing Ceremonies (BC /NG)  
Group Picture (SE)
- 1530 Adjourn (Group Hug)