

**Symposium on Engaging Undergraduates in Research And Inquiry:
A scholarly Dialogue, May 20, 2011, HKUST**

1. Project/Course title

ELEC125: Introduction to Electro-Robot Design

2. Project/Course team

Name	Institute	Post	Department/ Division	E-mail
<i>Course Instructor/Project leader:</i> Dr Ling SHI	HKUST	AP	ECE	eesling@ust.hk
<i>Members (if any):</i> Dr Zhiyong FAN Dr C. Y. TSUI Dr Manshun CHAN Dr Zexiang LI				

BEFORE

3. Project/Course objectives (Intended Learning Outcomes) (*Suggested number of words 30-40 words*)

What did you intend students to learn from this project/course?

<p>On successful completion of this course, students will be able to</p> <p>CO1: <i>recognize</i> the history and development of major Electronic & Computer Engineering (ECE) fields.</p> <p>CO2: <i>analyze, design, and debug</i> simple analog circuits, combinatorial and sequential logic circuits, and <i>design and implement</i> simple feedback control strategies.</p> <p>CO3: <i>build</i> a real engineering system following a hierarchical design principle.</p> <p>CO4: <i>work</i> in a team environment: learn and practice effective project and time management.</p> <p>CO5: <i>execute</i> a complete project from problem formulation, design/implementation, up to verification and documentation.</p>

4. Inquiry Based Learning Activities (*Suggested number of words: 75-85 words*)

What did students do (inquiry-based learning activities) during the course/project?

Lectures: acquired key concepts and theories (CO1, CO2)

Tutorials: review worked examples (CO2); and learned and practiced presentation skills and team-working skills. (CO4)

Labs: learned how to use the frequently used electronic instruments. (CO2); designed the robot step by step. (CO3); and designed and debugged circuits and implement robot controllers (CO2)

Projects: applied the knowledge and principles learnt to design and built a functional robot (CO2); built a functional robot using hierarchical design (CO3); worked in a team environment (CO4); executed a complete project (CO5).

AFTER (*Suggested number of words for items 5 & 6: 50-60 words*)

5. How did you assess the effectiveness of students' learning?

Please give an account of the assessment methods and results.

We used multiple choice and fill-in-the-blank questions in quizzes and homework to test whether students recognized major historical events and developments in electronic and computer engineering (CO1); we asked circuit analysis and design questions in quizzes, homework, both written and practical lab mid-term exams and lab demonstrations to test whether students could apply the theories learned in lectures to analyze design and debug simple analog circuits, combinatorial and sequential logic circuits in addition to implementing simple feedback control strategies (CO2); lastly we used the final project demonstration to test whether students could design and build a functional robot following a hierarchical design principle (CO3), work effectively in a team (CO4), and execute a complete project (CO5).

6. What were the major outcomes of this project/course? Do they match with your

Intended Learning Outcomes (objectives)?

Examples of outcomes include educational software, improvement in student learning or change in student attitude.

The major outcomes of this course are that: students got accustomed to working as a team; acquired a broader knowledge of electronic and computer engineering; applied the theories and built a functional robot in the end. The outcomes match well with our intended learning outcomes.