City University of Hong Kong

Information on a Course

offered by Department of Architecture and Civil Engineering
with effect from Semester A in 2014 / 2015

Part I

Course Title: Advanced Electronics and Information in Buildings
Course Code: CA8621D
Course Duration: 1 Semester
(Courses offered in Summer Term may start a few weeks earlier than the normal University schedule. Please check the teaching schedules with CLs before registering for the courses.)
Credit Units: 3
Level: D8
Medium of Instruction: English
Prerequisites: Nil
Precursor: Nil
Equivalent Courses: BC8621D Advanced Electronics and Information in Buildings
Exclusive Courses: Nil

Part II

1. Course Aims:

To highlight the importance of electronic systems, information and communication systems in modern intelligent buildings and to compare the advantages and disadvantages of different systems serving a modern building.

2. Course Intended Learning Outcomes (CILOs):

Upon successful completion of this course, students should be able to:

<table>
<thead>
<tr>
<th>No.</th>
<th>CILOs</th>
<th>Weighting (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>discuss the basic principles of different control, automation, data communication and networking systems in buildings at the system level;</td>
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<td>2.</td>
<td>design extra-low-voltage systems in modern buildings;</td>
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<td>3.</td>
<td>design control and monitoring systems from a functional specification point of view;</td>
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<td>4.</td>
<td>appraise new technologies adopted in building automation.</td>
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3. Teaching and Learning Activities (TLAs):

**Semester Hours:** 3 hours per week  
**Lecture/Tutorial/Laboratory Mix:** Lecture (2); Tutorial (1); Laboratory (0)

<table>
<thead>
<tr>
<th>CILO No.</th>
<th>TLAs</th>
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</table>
| CILO 1   | Lectures and Tutorials:  
       Microcontrollers (MCU), programmable logic controllers (PLC),  
       networking technologies, internetworking protocols.  
       Case study: An universal infra-red transmitter. |
|          |      |
| CILO 2   | Lectures and Tutorials:  
       internetworking protocols, socket programming, high-level  
       communication protocols in the Internet such as SMTP and HTTP.  
       Demonstration: Simple home automation system. |
|          | 15   |
| CILO 3   | Lectures and Tutorials:  
       OSI model and existing open communication protocols in the  
       industry. |
|          | 6    |
| CILO 4   | Lectures: Advanced digital signal processing techniques, encryption and decryption  
       technologies, etc. |
|          | 3    |

4. Assessment Tasks/Activities:

**Coursework:** 100%  
**Examination:** 0%

Students must attain the minimum pass grade for each and every assignment in order to pass the course as a whole.

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<tr>
<th>CILO No.</th>
<th>Type of assessment tasks/activities</th>
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</table>
| CILO 1   | Assignment to employ MCU, PLC and networking  
       technologies to tackle problems in building  
       environments. |
|          | --- |
| CILO 2   | Assignment on application of Information technology in  
       building environments (to facilitate students to reflect on  
       the importance of high-level communication protocols and  
       summarize the outcomes of these reflections in written form). |
|          | --- |
| CILO 3   | Assignment on application of open communication  
       protocols. |
|          | --- |
| CILO 4   | Assignment on discussion of new technologies in  
       building automation (to facilitate students to study  
       effective technologies and their impacts on building  
       automation). |
|          | --- |
5. Grading of Student Achievement:

Grading Pattern:

Standard

Part III

Keyword Syllabus:

Programmable logic controllers; modern controllers; sensors; building automation; energy management; integration of technologies; open systems; local and wide area networks; protocols; digital signal processing; high-speed broadband communication; emphasis of the whole course shall be on a system and module level where application and appreciation are being focused on.

Recommended Reading:

- **Texts:**

- **Online Resources:**
  1. Nil