14:332:254 - Programming Methodologies I Laboratory

Course Catalog Description: 14:332:254 - Programming Methodologies I Laboratory (1) Laboratory course associated with Programming Methodologies I. Implementation of basic C++ programs.

Pre-Requisite Courses: 14:440:127 or the equivalent

Co-Requisite Courses: 14:332:252 Programming Methodology I

Pre-Requisite by Topic:
1. Basic programming

Textbook & Materials:
C++ How to Program, Deitel & Deitel, Lab Manual (online version) available with course textbook.

References: None

Overall Educational Objective:
To introduce C++ programming and data structures

Course Learning Outcomes:
A student who successfully fulfills the course requirements will have demonstrated:
1. knowledge of simple C++ programming
2. knowledge of compilation
3. knowledge of simple algorithm design

How Course Outcomes are Assessed:
- Presence in laboratory (completion of assignment) (30 %)
- Laboratory programs including Final Project (70 %)

N = none S = Supportive H = highly related

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Level</th>
<th>Proficiency assessed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) an ability to apply knowledge of Mathematics, science, and engineering</td>
<td>H</td>
<td>Laboratory assignments</td>
</tr>
<tr>
<td>(b) an ability to design and conduct experiments and interpret data</td>
<td>H</td>
<td>Laboratory assignments</td>
</tr>
</tbody>
</table>
(c) an ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability | S | Pre-lab assignments

(d) an ability to function as part of a multi-disciplinary team | N |

(e) an ability to identify, formulate, and solve ECE problems | S | Performing laboratory assignments

(f) an understanding of professional and ethical responsibility | S | Laboratory assignments

(g) an ability to communicate in written and oral form | S | Laboratory assignments and reports

(h) the broad education necessary to understand the impact of electrical and computer engineering solutions in a global, economic, environmental, and societal context | N |

(i) a recognition of the need for, and an ability to engage in life-long learning | S | Extra lab sessions on advanced topics

(j) a knowledge of contemporary issues | N |

(k) an ability to use the techniques, skills, and modern engineering tools necessary for electrical and computer engineering practice | H | Laboratory assignments

Basic disciplines in Electrical Engineering | N |

Depth in Electrical Engineering | N |

Basic disciplines in Computer Engineering | H | Laboratory assignments

Depth in Computer Engineering | S | Final laboratory project assignment

Laboratory equipment and software tools | H | Software development environment

Variety of instruction formats | S | Online discussion, electronic submission, in-lab lecture

**Topics Covered week by week:**

Week 1: Introduction & basic C++.
Week 2: Looping.
Week 3: Functions
Week 4: Arrays
Week 5: Pointers and Strings
Weeks 6 and 7: Classes
Weeks 8 and 9: Classes
Weeks 10 and 11: Classes
Weeks 12, 13, and 14: Linked List and Project
Computer Usage:
Programming Assignments.

Laboratory Experiences:
Moderate design experience in constructing C++ programs.

Design Experiences:
1. development of program design

Contribution to the Professional Component:

(a) College-level mathematics and basic sciences: 0.25 credit hours
(b) Engineering Topics (Science and/or Design): 0.75 credit hours
(c) General Education: 0 credit hours
Total credits: 1

Prepared by: Y. Zhang
Date: June 2011