ELCT 531 - Digital Control Systems

CREDITS/CONTACT HOURS: Credits: 3, Contact Hours: 42

COORDINATOR: Dr. Herbert L. Ginn

TEXTBOOKS AND OTHER REQUIRED MATERIAL:
Digital Control System Analysis and Design, by C. L. Phillips, H. T. Nagle:

SUPPLEMENTAL MATERIALS:

CATALOG DATA:
(Prerequisite: ELCT331). Three hour lecture. Analysis and design of discrete-time control systems, implementation of control systems using digital electronic systems. Applications to electrical systems.

REQUIRED/ELECTIVE:
Required

TOPICS COVERED:
- Introduction to digital control systems (3 hours)
- Discrete time systems and the z-transform (3 hours)
- Sampling and reconstruction (9 hours)
- State variables in discrete time systems (6 hours)
- Closed-loop discrete time systems (6 hours)
- Sampled-data transformation of analog controllers (6 hours)
- Digital controller design (9 hours)

COURSE OUTCOMES:
1. Students will be able to model sampled-data systems (a,e)
2. Students will be able to analyze simple discrete-time state-variable systems (a)
3. Students will be able to design digital compensators (a,e,k)
Relation of course outcomes to program outcomes  
H = major importance, M = moderate importance, L = minor importance, blank indicates no relation

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<thead>
<tr>
<th>Program Outcomes</th>
<th>Course Outcomes</th>
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<tr>
<td>an ability to apply knowledge of math, science and eng. (a)</td>
<td>L</td>
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<td>an ability to design and conduct experiments, as well as to analyze and interpret data (b)</td>
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<td>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 (c)</td>
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<td>an ability to function on multidisciplinary teams (d)</td>
<td>M</td>
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<td>an ability to identify, formulate and solve engineering problems (e)</td>
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<td>an ability to use the techniques, skills, and modern eng. tool necessary (k)</td>
<td>H</td>
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ASSESSMENT METHODS:
1. Tests
2. Homework Assignments
3. Final Project