**ELCT 553 - Electromechanical Energy Conversion**

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

COORDINATOR: Dr. Charles Brice

TEXTBOOKS AND OTHER REQUIRED MATERIAL:

SUPPLEMENTAL MATERIALS:
None

CATALOG DATA:
(Prerequisites: ELCT 331, ELCT 361). Analysis and design of electromechanical energy conversion systems, including electrical machines and electronic drives

REQUIRED/ELECTIVE: Elective

TOPICS COVERED:
- Magnetic circuits and materials (3 hrs)
- Transformers (4.5 hrs)
- Energy conversion (6 hrs)
- Machine fundamentals (6 hrs)
- Synchronous machines (4.5 hrs)
- Induction machines (6 hrs)
- DC machines (4.5 hrs)
- Other machines (1.5 hrs)
- Drives and controls (3 hrs)
- Review and exams (3 hrs)

COURSE OUTCOMES:
No program outcomes are assessed in this course

Course learning outcomes: The student will be able to

1. Analyze magnetic circuits
2. Calculate performance of transformers
3. Calculate force or torque developed by magnetic-field devices
4. Understand the principles of operation of basic types of motors and generators
5. Calculate performance of synchronous generators
6. Calculate performance of induction motors

Note: performance means steady state performance and includes efficiency and voltage or speed regulation.
### Relation of course outcomes to program outcomes

H = major importance, M = moderate importance, L = minor importance, blank indicates no relation

<table>
<thead>
<tr>
<th>Program Outcomes</th>
<th>Course Outcomes</th>
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<tbody>
<tr>
<td></td>
<td>1   2   3   4   5   6</td>
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<tr>
<td>an ability to apply knowledge of math, science and eng. (a)</td>
<td>M   M   M   M</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>
<td>M</td>
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<td>an ability to function on multidisciplinary teams (d)</td>
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<td>an ability to identify, formulate, and solve engineering problems (e)</td>
<td>H   H   H   H   H   H</td>
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<td>a recognition of the need for, and an ability to engage in life-long learning (i)</td>
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<td>a knowledge of contemporary issues (j)</td>
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<td>an ability to use the techniques, skills, and modern eng. tool necessary (k)</td>
<td>L   L   L</td>
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**ASSESSMENT METHODS:**

1. Exams
2. Homework