### Program Courses

#### Year One – Fall Semester

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 1750*</td>
<td>Applied Technical Math I</td>
<td>3</td>
</tr>
<tr>
<td>ETEE 1050</td>
<td>Introduction to Electromechanical Systems</td>
<td>3</td>
</tr>
<tr>
<td>ETEE 1800</td>
<td>Introduction to Digital Systems</td>
<td>3</td>
</tr>
<tr>
<td>ETUT 1060*</td>
<td>Energy Industry Safety</td>
<td>3</td>
</tr>
<tr>
<td>ETUT 1160</td>
<td>Introduction to Energy Utility Industry</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Year One – Fall Semester 15

#### Year One – Spring Semester

<table>
<thead>
<tr>
<th>Course No.</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>ETEE 1500</td>
<td>Electrical Systems I</td>
<td>3</td>
</tr>
<tr>
<td>ETEE 2390</td>
<td>Electrical Power Systems</td>
<td>3</td>
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<tr>
<td>PHYS 1070</td>
<td>Introduction to Renewable Energy</td>
<td>3</td>
</tr>
<tr>
<td>ETUT 2500</td>
<td>Energy Industry Capstone and Practicum</td>
<td>3</td>
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</table>

Total Year One – Spring Semester 12

Program total 27 credits

* Placement test required.

P This course has a prerequisite. Successful completion of course required before registering.

C This course has a corequisite. Course must be taken prior to or at the same time.

For more information:

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Visit www.ccri.edu/engt for more information about this program.

Gainful employment information for the ETUT certificate program can be found at www.ccri.edu/acadaffairs/gainful-employment/bst/engr/energy-tech-cert.html.

Note: Please check with the department regarding changes to this program.
This two-semester, 27-credit certificate program provides students with a core set of skills and competencies the energy industry requires. ETUT coursework covers energy industry technology and operations, technical math, AC and DC circuits, controls, and computer applications. The program emphasizes safety issues, critical thinking and problem-solving skills as well as teamwork, time management, workplace behavior and business ethics.

An eight-week, daylong energy industry practicum with a regional energy provider will present hands-on training and experience as students apply classroom theoretical knowledge in a practical, real-world environment. Students also will be required to complete a program portfolio containing key learning outcomes, reports and projects.

Presently, this program is offered only as a full-time, day program that begins in the fall semester. All credits earned for the certificate will apply towards the Engineering Systems Technology A.S. degree. This program is limited to 20 enrollees. The admissions process includes an interview with department faculty.

**ETEE 1050 – Introduction to Electromechanical Systems (3 credits)**

This course introduces the student to the nature of electricity and magnetism, as well as to the applications of practical electrical and electromechanical devices and systems. Students study electrical laws in basic DC and AC circuits and the behavior of passive and active circuits and components. Students also receive an introduction to basic electromechanical components such as relays, switches, motors and generators.

**ETEE 1500 – Electrical Systems I (3 credits)**

This course covers AC and DC circuits. Students learn and implement analysis techniques in laboratory experiments using physical components, instruments and computer analysis. Students study impedance and networks and passive filters. Power transformers and single-phase/three-phase power distribution are introduced. (Prerequisite: ETEE 1050)

**ETEE 1060 – Energy Industry Safety (3 Credits)**

This course provides an introduction to the principles of safety and guidelines for the design and maintenance of energy equipment. Students will learn the skills necessary for safe power generation, transmission and distribution. Safe working conditions will be compared to industry standards and OSHA regulations. (Prerequisites: MATH 0600, ENGL 0700 or equivalent; Corequisites: ETUT 1160, ETEE 1050)

**ETUT 1160 – Introduction to Energy Utility Industry (3 Credits)**

This course provides the student with an overview of the energy utility industry including the history of providing reliable energy service, regulatory influences and electric/gas energy flow. Students learn about conditions for employment and career opportunities. Current technology for energy generation, transmission and distribution is discussed and demonstrated. (Prerequisites: MATH 0600, ENGL 0700 or equivalent; Corequisites: ETUT 1160, ETEE 1050)

**ETTE 1800 – Introduction to Digital Systems (3 Credits)**

The student learns about digital logic operation as implemented with hardware and software. The fundamentals of binary numbers and codes, logic circuit types and operation, combinational and sequential logic functions, and data conversion methods are explored. Standard digital interfaces and busses are examined. Oscilloscopes, logic analyzers, word and pulse generators and simulation software are used to simulate and test digital circuits. (Corequisites: ETEE 1050, MATH 1750)

**ETEE 2390 – Electrical Power Systems (3 Credits)**

Three-phase delta/wwye and single-phase power circuits are analyzed. Measurement with instrument transformers and two/three wattmeters are emphasized and used in laboratory experiments. AC and DC motors and generators, stepper motors and universal motors are studied and used in related laboratory experiments. Emphasis is on operation, measurement of motor/generator characteristics and control. (Prerequisite: ETEE 1050; Corequisite: ETEE 1500)

**ETUT 2500 – Energy Industry Practicum and Capstone (3 Credits)**

This course introduces the student to the practical skills and procedures of a major power generation company (National Grid). Students learn how to splice wires and connect fuses and transformers. Students become familiar with tools and equipment used in the power industry. The course also functions as a program capstone, providing the student an opportunity to apply energy utility industry knowledge and to complete the program portfolio. The practicum is one day per week for eight to nine consecutive weeks at the National Grid Training Center in Milbury, Mass. (Prerequisites: MATH 1750, ETEE 1050, ETUT 1060, ETUT 1160, ETUT 1800; Corequisites: ETEE 1500, ETEE 2390, PHYS 1070)

**MATH 1750 – Applied Technical Math I (3 Credits)**

This course is an intense survey of algebra and trigonometry for technology. Topics include functions and graphs, quadratic equations, systems of linear equations, exponents and radicals, logarithms, trigonometry and complex numbers. (Prerequisite: Placement test)

**PHYS 1070 – Introduction to Renewable Energy (3 Credits)**

This course introduces renewable energy resources and applied technologies including wind, solar, geothermal and hydro-electric energy contrasted to fossil fuel-based sources of energy. (Prerequisite: MATH 0650)