College Utility Training Programs (US)
College Utility Training Programs (US)

- National Grid has partnered with various colleges throughout our US service territory on programs designed to prepare students for entry-level positions in the electrical and/or gas utility industry.

- The programs vary in nature and duration, but rely on the knowledge and skills of our National Grid Academy instructors to support specific courses within these programs.

- Some of the programs are delivered entirely at the colleges, while others have certain courses that are delivered by our instructors at the National Grid Learning Centers.
College Utility Training Programs (US)

■ Active programs: 7
  ■ Electric programs: 6
  ■ Gas programs: 1

* First program started in Fall 2006 in UNY (Erie CC)

■ Programs in development: 7
  ■ Electric program: 1
  ■ Gas programs: 4
  ■ General Utility programs: 2
College Utility Training Programs (US)

- New York State
  - Overhead Electric Lineworker Certificate (Erie CC & Hudson Valley CC)
  - Line Mechanic Utility Worker Certificate (Onondaga CC)
  - Natural Gas Technician Certificate (Farmingdale State College (SUNY) & Other UNY Colleges - TBD)
  - Utility Industry On-Line Certificate (Stony Brook University - SUNY)
  - AOS in Electric (Onondaga CC)
  - Troops to Energy Jobs – Natural Gas Boot Camp (Jefferson CC)
  - MS in Business of Energy (Clarkson University)

- New England
  - Energy Utility Technology Certificate (Quinsigamond CC; Middlesex CC; & Community College of Rhode Island)
  - Natural Gas Technician Certificate (Quinsigamond CC)
Agenda

1. Erie Community College
2. Hudson Valley Community College
3. Onondaga Community College
4. Farmingdale State College
5. Stony Brook University (SUNY)
6. Jefferson Community College
7. Clarkson University
Erie Community College (ECC)

- Overhead Electric Lineworker Certificate
- Inception Date: Fall 2006
- Students receiving certificate: 140 (thru 5/2014)
ECC – Overhead Electric Lineworker Certificate

- The certificate program offers theory and practical training in the electric utility power industry. The program prepares students for entry into an apprenticeship servicing overhead electric distribution power lines. The classes taught are also applicable to other apprenticeships.

- The students are presented with a solid foundation in electrical theory along with hands-on laboratory experience. The time spent in the laboratory consists of the essential theory and hands-on skills necessary for an Overhead Electric Line Worker. Heavy emphasis is placed on safe work practices.
## ECC - Curriculum

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL 110</td>
<td>Electricity I &amp; EL 111 Lab</td>
<td>5</td>
</tr>
<tr>
<td>MT 126</td>
<td>College Math II</td>
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<tr>
<td>PH 260</td>
<td>Technical Physics I &amp; PH 261 Lab</td>
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<tr>
<td>EL 150</td>
<td>Electricity II &amp; EL 161 Lab</td>
<td>5</td>
</tr>
<tr>
<td>EL 153</td>
<td>Electronic Fabrication</td>
<td>1.5</td>
</tr>
<tr>
<td>EL 170</td>
<td>Electric Power Systems</td>
<td>3</td>
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<tr>
<td>EN 110</td>
<td>English</td>
<td>3</td>
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<tr>
<td>EL 173</td>
<td>Electric Power Overhead Construction (aka: Pole Climbing School)</td>
<td>4</td>
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<td><strong>Total Credits</strong></td>
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</table>

EL 170 and EL 173 supported by National Grid. All courses delivered at the ECC campus. Classroom lecture, hands-on, physical, climbing, indoor laboratories, outdoor line yard.
Electric Power Systems course (EL170)

- Electric Safety
- Introduction to Power Systems
- Conductors
- Secondary Service Installations
- Distribution Transformers
- Overcurrent Protection
- Substations
- Underground Systems
- Transmission Systems (Hot Sticking)

Adjunct: Wayne Cole, Chris Dool
Time: 4:00pm-6:00pm (lecture)
       4:00pm-8:00pm (lab)
Duration: 15 Weeks (twice per week)
Location: ECC Campus
Electric Power Overhead Construction course (EL173)

- Electrical Hazard Awareness
- CPR/First Aid/AED
- Portable Ladder Safety
- Vehicle Inspection
- Bucket Truck Operations
- Digger Derrick Operations
- Wood Pole Inspection/Installation
- Wood Pole Climbing
- Secondary Service Installations
- Crossarm Installation
- Transformer Installation
- URD Standards

**Adjunct:** Chris Dool, Eric Nuwer  
**Time:** 8:00am-2:30pm  
**Duration:** 3 Weeks (every day)  
**Location:** ECC South Campus
Agenda

1. Erie Community College

2. Hudson Valley Community College

3. Onondaga Community College

4. Farmingdale State College

5. Stony Brook University (SUNY)

6. Jefferson Community College

7. Clarkson University
Hudson Valley Community College (HVCC)

- Overhead Electric Line Worker Certificate
- Inception Date: Fall 2007
- Students receiving certificate: 43 (thru 5/2014)
HVCC – Overhead Electric Lineworker Certificate

- The certificate program was developed in response to the demand for overhead electric line workers throughout the Capital Region. The electric utility industry is facing a critical shortage of qualified workers, specifically line mechanics and technicians due to a large number of workers retiring. To fill their workforce needs, utilities are looking for employees that have completed technical training at the community college level to handle the increased technical challenges they face.

- The certificate program consists of new and existing courses in the Electrical Construction and Maintenance A.O.S. degree program. These courses include AC/DC electricity, technical math, electrical wiring and industry specific electric power.
# HVCC - Curriculum

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECMN 101</td>
<td>Direct Current Theory</td>
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<tr>
<td>ECMN 111</td>
<td>Direct Current Applications Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ECMN 121</td>
<td>Residential Construction Wiring</td>
<td>5</td>
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<tr>
<td>ECMN 130</td>
<td>Safety and Labor Relations</td>
<td>2</td>
</tr>
<tr>
<td>ECMN 131</td>
<td>Electrical Blueprint Reading and Estimating I</td>
<td>2</td>
</tr>
<tr>
<td>MATH 105</td>
<td>Applied Technical Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td>ECMN 102</td>
<td>Alternating Current Theory</td>
<td>4</td>
</tr>
<tr>
<td>ECMN 112</td>
<td>Alternating Current Applications Laboratory</td>
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<tr>
<td>ECMN 122</td>
<td>Commercial Construction Wiring</td>
<td>5</td>
</tr>
<tr>
<td>ECMN 190</td>
<td>Electric Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>MATH 106</td>
<td>Applied Technical Mathematics II</td>
<td>3</td>
</tr>
<tr>
<td>ECMN 191</td>
<td>Electric Power Overhead Construction (aka: Pole Climbing School)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits** 36

ELT 190 and ELT 191 supported by National Grid.
ELT 191 delivered at the National Grid Schenectady Learning Center.
Classroom lecture, hands-on, physical, **climbing**, indoor laboratories, outdoor line yard.
During the 1st semester (Fall), students attend a 1 day orientation program. This is delivered by 2 NG training employees and various CMS and Electric Operation employees at the Schenectady Learning Center. The students participate in a facilities tour and hands-on activities which include bucket flights, climbing poles a few feet, driving a lag screw, carrying a ladder, operating a switch stick, etc.
Electric Power Systems course (ECMN 190)

- Electric Safety
- Introduction to Power Systems
- Design Standards
- Print Reading/Trouble Shooting
- Knots and Splices
- Tools & Rigging
- Wye-Delta Systems
- Distribution Transformers
- Transmission Systems (Hot Sticking)
- Overcurrent Protection

**Adjunct:** Rick Quackenbush  
**Time:** 4:30pm-10:30pm (One 2 hour lecture, Two 2 hour labs)  
**Duration:** 15 Weeks (once per week)  
**Location:** HVCC Campus
Electric Power Overhead Construction course (ECMN 191)

- Electrical Hazard Awareness
- CPR/First Aid/AED
- Portable Ladder Safety
- Vehicle Inspection
- Bucket Truck Operations
- Digger Derrick Operations
- Wood Pole Inspection/Installation
- Wood Pole Climbing
- Secondary Service Installations
- Crossarm Installation
- Transformer Installation
- URD Standards

Adjunct: Chuck Noone, Mike Pommer (L97)
Time: 8:00am-2:30pm
Duration: 3 Weeks (every day)
Location: Schenectady Learning Center
Agenda

1. Erie Community College
2. Hudson Valley Community College
3. Onondaga Community College
4. Farmingdale State College
5. Stony Brook University (SUNY)
6. Jefferson Community College
7. Clarkson University
Onondaga Community College (OCC)

- Line Mechanic Utility Worker Certificate
- Inception Date: Fall 2008
- NYS Accreditation
- Students receiving certificate: 24 (thru 5/2014)

- Note: Currently Discussing the Development of an AOS Degree in Electric.
This certificate program helps prepare students for a career in the utility industry. The one year certificate lays the groundwork for many of the job titles associated with electric utility companies. The certificate includes both classroom and lab work geared for students interested in the utility industry.
# OCC - Curriculum

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELT 101</td>
<td>Electric Power Distribution and Overhead Construction</td>
<td>3</td>
</tr>
<tr>
<td>ELT 141</td>
<td>Circuits I</td>
<td>4</td>
</tr>
<tr>
<td>CMT 101</td>
<td>Introduction to Computers and Applications</td>
<td>4</td>
</tr>
<tr>
<td>MAT 143</td>
<td>Pre-Calculus With Trigonometry</td>
<td>4</td>
</tr>
<tr>
<td>ENG 103</td>
<td>Freshman Composition and Literature I</td>
<td>3</td>
</tr>
<tr>
<td>ELT 161</td>
<td>Electronic Circuits I</td>
<td>4</td>
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<tr>
<td>ELT 201</td>
<td>Power Technology</td>
<td>4</td>
</tr>
<tr>
<td>ELT 285</td>
<td>Power Systems I</td>
<td>4</td>
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</tbody>
</table>

**Total Credits: 30**

ELT 101 and ELT 201 supported by National Grid.
ELT 101 and ELT 201 delivered at the National Grid Syracuse Learning Center.
Classroom lecture, hands-on, physical, indoor laboratories, outdoor line yard.
Electric Power Distribution OH Construction course (ELT 101)

- Electric Safety
- Introduction to Power Systems
- Portable Ladder Safety
- Vehicle Inspection
- Bucket Truck Operations
- Digger Derrick Operations
- Wood Pole Inspection/Installation
- Meter Sets
- Secondary Service Installations
- Clearance & Control (CRCC/TCC tour)
- Overcurrent Protection

**Adjunct:** Jeff Steiner, Jim Kelly, Zeke Dacko (L97)
**Time:** 5:30pm-9:30pm (2 hour lecture, 2 hour lab)
**Duration:** 15 Weeks (once per week)
**Location:** Syracuse Learning Center
Power Technology course (ELT 201)

- Electrical Hazard Awareness
- Basic Electricity
- Reliability
- Demand Response
- Geographic Information System
- NESC Clearances
- Generation (Covanta Energy field trip)
- Substations (Substation tour)
- Underground Systems
- Transmission Systems (Hot Sticking)
- Distribution Transformers

Adjunct: Jeff Steiner, Jim Kelly, Zeke Dacko (L97)
Time: 5:30pm-9:30pm (2 hour lecture, 2 hour lab)
Duration: 15 Weeks (once per week)
Location: Syracuse Learning Center
Agenda

1. Erie Community College
2. Hudson Valley Community College
3. Onondaga Community College
4. Farmingdale State College
5. Stony Brook University (SUNY)
6. Jefferson Community College
7. Clarkson University
Farmingdale State College (FSC)

- Natural Gas Technician Certificate
- Inception Date: Summer 2016
- Students receiving certificate: n/a
FSC – Natural Gas Technician Certificate

- The certificate program serves as an introduction to the Gas Industry and exposes students to the job tasks, work methods and safety practices utilized by various workforce positions in gas construction, maintenance, and customer service. The program prepares students for entry level positions in the natural gas industry.

- The students are presented with a solid foundation in gas theory along with hands-on laboratory experience. The time spent in the laboratory will consist of the essentials theory and hands-on skills necessary for an Gas field worker. Heavy emphasis is placed on safe work practices.

- All classes will be taught at the National Grid Melville Learning Center by highly experienced gas industry instructors.

Adjunct: Travaglia; Mead; Gerber; Jenkins; Loughnane
Time: 6:00pm-9:00pm (lecture & lab) & Sat 8:00am – 2:00pm
Duration: 12 Weeks (twice per week & 4 Saturdays)
Location: NGrid - Melville Learning Center
FSC - Curriculum

- Safety and Protocols
- Overview and Infrastructure
- Personal Safety and Hazardous Materials Safety
- Work Zone Traffic Control Traffic Safety
- Tools of the Trade (Field Operations)
- Safe Excavation Practices
- Excavation Safety/Chain Saw Safety
- Excavation Safety/Cargo Securement/Pneumatic Tools
- Gas Distribution System Fundamentals
- Abnormal Operating Conditions
- Introduction to Gas Customer Metering
- Tools of the Trade (Metering)
- Introduction to Corrosion and Corrosion Prevention
- Damage Prevention
- Leak Investigation
- Line Locating/Utility Marking/Pneumatic Tools
- Pressure Control, Regulation and Monitoring
- Pipe Joining (Pressure Testing and Electrofusion)
- Pipe Joining (Mechanical Fittings)
- Pipe Joining (Manual Butt Fusion)
- Pipe Joining (Hydraulic Fusion, Squeeze-Off)
- Low Pressure & Low Pressure Tapping and Stopping
Agenda

1. Erie Community College
2. Hudson Valley Community College
3. Onondaga Community College
4. Farmingdale State College
5. Stony Brook University (SUNY)
6. Jefferson Community College
7. Clarkson University
Stony Brook University (SBU)

- Utility Industry “On-Line” Certificate Program (UIC)
- Inception Date: Currently In Development
- Students receiving certificate: n/a

The Energy Industry Certificate program will provide individuals with the introductory knowledge and competency required for a successful transition to employment in the energy industry. The goal is to increase the pipeline of qualified individuals interested in a career in the energy industry to address the growing need for new employees resulting from aging workforce demographics. Individuals obtaining the certificate will have enhanced employment opportunities in the industry due to their demonstrated knowledge and aptitude in relevant topics.

The primary target audience is individuals with a high school diploma interested in self-development and/or to transition to a career in the Energy Industry. The secondary target audience would be existing energy company employees with 0-3 years of experience who have not yet completed similar training and would benefit by the targeted developmental topics.

This online program will provide these individuals with the flexibility to complete the required modules as their schedules allow. The target audience is not confined to NY State and the program is envisioned to be marketed across the US.

Delivery Method - Asynchronous online course modules and electronic assessments. Total of 12 – 16 hours
SBU - Curriculum

- Energy Industry Overview
  - US Energy Industry Structure
  - Regulation & Rate Cases
  - Pricing, Trends & Future

- Intro to Safety
  - Personal Safety
  - Process Safety
  - OSHA Regulations
  - Personal Protective Equipment
  - Job Briefs
  - Work Zone Traffic Control
  - Driving Safety
  - Team Resource Management
  - Safety Culture
  - Soft Tissue Injury Prevention

- Intro to Natural Gas
  - Properties of Natural Gas
  - Gas Exploration & System Design
  - Gas Transmission & Distribution
  - Instrumentation & Pressure Regulation
  - Construction & Maintenance Practices
  - Customer Service & Metering
  - Liquid Natural Gas
  - Pipeline Operator Qualification

- Intro to Electric Power Systems
  - Basic Electricity
  - Generation, Transmission & Distribution
  - System Design & Switching
  - Storm Restoration
  - Renewable Energy
  - Smart Grid
Agenda

1. Erie Community College
2. Hudson Valley Community College
3. Onondaga Community College
4. Farmingdale State College
5. Stony Brook University (SUNY)
6. Jefferson Community College
7. Clarkson University
Jefferson Community College (JCC)

- Troops to Energy Jobs - Natural Gas Boot Camp (Currently in Development)
- Tentative Start Date: Fall 2016
“NY Troops to Energy Jobs - Natural Gas Boot Camp” is a joint effort with the US Army at Fort Drum, the Center for Energy Workforce Development (CEWD), Jefferson Community College, National Grid and Con Edison. It is envisioned as a four week program; 3 weeks (7 hr/day) of technical training and an additional week for resume writing, interviewing skills, etc. The program is tentatively scheduled to start in late October 2016.
Agenda

1. Erie Community College
2. Hudson Valley Community College
3. Onondaga Community College
4. Farmingdale State College
5. Stony Brook University (SUNY)
6. Jefferson Community College
7. Clarkson University
Clarkson University

- MS in Business of Energy
  (Currently in Development)
- Tentative Start Date: TBD
Agenda

1. Quinsigamond Community College
2. Middlesex Community College
3. Community College of Rhode Island
Energy Utility Technology Certificate

Inception Date: Fall 2007

Students receiving certificate: 155 (thru 5/2016)

Note: Currently Discussing the Creation of the Natural Gas Technician Certificate Program at QCC
The Energy Utility Technology Certificate program is designed to prepare students for entry-level positions in the electrical and/or gas utility industry.

The program includes courses that provide students with an introduction to the energy industry; knowledge of direct and alternating current circuits; generation, transmission and distribution of electricity; industrial safety; and computer applications.

In addition, students gain hands-on experience through a practicum in the second semester.
QCC- Curriculum

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EUT 110</td>
<td>Electrical Principles I</td>
<td>4</td>
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<tr>
<td>MAT 108</td>
<td>Applied Technical Math</td>
<td>4</td>
</tr>
<tr>
<td>CIS 111</td>
<td>Introduction to Microcomputer Applications</td>
<td>3</td>
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<tr>
<td>EUT 101</td>
<td>Fundamentals of the Energy Industry</td>
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<tr>
<td>EUT 115</td>
<td>Generation, Transmission, and Distribution</td>
<td>4</td>
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<tr>
<td>EUT 120</td>
<td>Industrial Safety</td>
<td>3</td>
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<tr>
<td>EUT 111</td>
<td>Electrical Principles II</td>
<td>4</td>
</tr>
<tr>
<td>EUT 190</td>
<td>Energy Utility Practicum</td>
<td>3</td>
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<td><strong>Total Credits</strong></td>
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</table>

EUT 190 is supported by National Grid and classes are delivered at the Millbury Learning Center. Classroom lecture, hands-on activities and physical tasks, are completed in indoor laboratories and in the outdoor yard area.
Energy Utility Practicum (EUT 190)

- Overhead Construction and Techniques
- Safety and Tools In the Utility Business
- Natural Gas Utility Overview
- Secondary Service Installations
- Pole Climb - Step Poles
- Underground Distribution Techniques
- Substation Maintenance Techniques
- Grounding and Grounding Techniques
- Metering Overview

Instructor: Bob McDonald and 1-2 Adjuncts
Time: 8:30A – 2:00P
Duration: 9 Weeks (once per week)
Location: Millbury Learning Center
Agenda

1. Quinsigamond Community College
2. Middlesex Community College
3. Community College of Rhode Island
Middlesex Community College (MCC)

- Energy Utility Technology Certificate
- Inception Date: Fall 2007
- Students receiving certificate: 142 (thru 5/2016)
The Energy Utilities Technology Certificate is a 10-month program designed to prepare students for entry-level positions in the electrical utility industry.

The industry has forecasted a strong need for new employees in the next several years for positions such as line worker, meter worker and substation maintenance personnel.

The program includes courses that give students an introduction to the energy utilities industry, knowledge of direct and alternating current circuits, generation, transmission and distribution of electricity, industrial safety, and computer applications.
## MCC- Curriculum

<table>
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<th>Title</th>
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<tbody>
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<td>EUT 111</td>
<td>Principles of Electricity 1</td>
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<tr>
<td>TMA 095</td>
<td>Applied Technical Mathematics</td>
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<tr>
<td>EUT 101</td>
<td>Introduction to Energy Industry</td>
<td>3</td>
</tr>
<tr>
<td>EUT 171</td>
<td>Generation, Transmission, and Distribution</td>
<td>4</td>
</tr>
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<td>CAP 101</td>
<td>Computer Applications</td>
<td>3</td>
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<tr>
<td>EUT 151</td>
<td>Industrial Safety</td>
<td>3</td>
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<tr>
<td>EUT 161</td>
<td>Principles of Electricity 2</td>
<td>4</td>
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<tr>
<td><strong>EUT 181</strong></td>
<td><strong>Energy Internship</strong></td>
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<tr>
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</table>

EUT 181 is supported by National Grid and classes are delivered at the Millbury Learning Center. Classroom lecture, hands-on activities, and physical tasks, are completed in indoor laboratories and in the outdoor yard.
Energy Internship (EUT 181)

- Overhead Construction and Techniques
- Safety and Tools In the Utility Business
- Natural Gas Utility Overview
- Secondary Service Installations
- Pole Climb - Step Poles
- Underground Distribution Techniques
- Substation Maintenance Techniques
- Grounding and Grounding Techniques
- Metering Overview

**Instructor:** Bob McDonald and 1-2 Adjuncts  
**Time:** 8:30A – 2:00P  
**Duration:** 9 Weeks (once per week)  
**Location:** Millbury Learning Center
Agenda

1. Quinsigamond Community College
2. Middlesex Community College
3. Community College of Rhode Island
Community College of Rhode Island (CCRI)

- Energy Utility Technology Certificate
- Inception Date: Fall 2012
- Students receiving certificate: 56 (thru 5/2016)
CCRI – Energy Utility Technology Certificate

- This Certificate Program provides students with a core set of skills and competencies required by the energy industry. Course work covers technical math, safety, AC and DC circuits and controls, the business side of the energy industry, operations and technology.

- Workplace readiness skills are integrated into the curriculum including critical thinking, problem solving, time management and teamwork.

- Students are required to complete experiments with lab reports, special projects and a portfolio illustrating key learning outcomes.
## CCRI - Curriculum

<table>
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<th>Course Code</th>
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<tbody>
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<tr>
<td>ETEE 1050</td>
<td>Introduction to Electromechanical Systems</td>
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</tr>
<tr>
<td>ETEE 1060</td>
<td>Energy Industry Safety</td>
<td>3</td>
</tr>
<tr>
<td>ETEE 1800</td>
<td>Introduction to Digital Systems</td>
<td>3</td>
</tr>
<tr>
<td>ETUT 1160</td>
<td>Introduction to Energy Utility Industry</td>
<td>3</td>
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<tr>
<td>ETEE 1500</td>
<td>Electrical Systems 1</td>
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<td>ETEE 2390</td>
<td>Electrical Power Systems</td>
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<td>PHYS 1070</td>
<td>Introduction to Renewable Energy</td>
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<td><strong>ETUT 2500</strong></td>
<td><strong>Energy Industry Capstone and Practicum</strong></td>
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<tr>
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<td><strong>Total Credits</strong></td>
<td>27</td>
</tr>
</tbody>
</table>

*includes OSHA 30 General Industry Certification

ETUT 2500 is supported by National Grid and classes are delivered at the Millbury Learning Center. Classroom lecture, hands-on activities, and physical tasks, are completed in indoor laboratories and in the outdoor yard.
Energy Industry Capstone and Practicum (ETUT2500)

- Overhead Construction and Techniques
- Safety and Tools in the Utility Business
- Natural Gas Utility Overview
- Secondary Service Installations
- Pole Climb - Step Poles
- Underground Distribution Techniques
- Substation Maintenance Techniques
- Grounding and Grounding Techniques
- Metering Overview

**Instructor:** Bob McDonald and 1-2 Adjuncts  
**Time:** 8:30A – 2:00P  
**Duration:** 9 Weeks (once per week)  
**Location:** Millbury Learning Center