Electrical Technology

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Description:
The Electrical Technology Program focuses on preparing students for various entry-level electrical positions in industry and the building trades. The study of electrical theory in the classroom and the practical application of that theory in labs provide the foundation of this program. This program is versatile in offering three different specializations within the Associate of Applied Science degree. A variety of certificates and diplomas serve as pathways to the AAS degree specializations or as meeting specific training needs.

Students enrolled in the Electrical Technology program are required to achieve a minimum grade of "C" in the technical core and in those courses selected as technical electives.

Implementation Term: Spring 2008

Competencies:
AAS: Electrical Technology
General Education Competencies: (AAS & Diploma)
Competencies will be met at the level appropriate to the credential.

Upon completion of this program, the graduate can:

I. Communicate Effectively
   1. Read and listen with comprehension.
   2. Speak and write clearly using standard English.
   3. Interact cooperatively with others using both verbal and non-verbal means.
   4. Demonstrate information processing through basic computer skills.

II. Think Critically
   1. Make connections in learning across the disciplines and draw logical conclusions.

2. Demonstrate problem solving through interpreting, analyzing, summarizing, and/or integrating a variety of materials.
3. Use mathematics to organize, analyze, and synthesize data to solve a problem.

III. Learn Independently
1. Use appropriate search strategies and resources to find, evaluate, and use information.
2. Make choices based upon awareness of ethics and differing perspectives/ideas.
3. Apply learning in academic, personal, and public situations.
4. Think creatively to develop new ideas, processes, or products.

IV. Examine Relationships in Diverse and Complex Environments
1. Recognize the relationship of the individual to human heritage and culture.
2. Demonstrate an awareness of the relationship of the individual to the biological and physical environment.
3. Develop an awareness of self as an individual member of a multicultural global community.

Construction Electrician Specialization and Diploma

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Design a resonant circuit.
13. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
14. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
15. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
16. Calculate and size wire using the National Electrical Code for residential applications.
17. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
18. Install different type of conduit systems using the correct installation criteria for the type of conduit chosen in commercial and industrial applications.
19. Compute the size of conductors needed in circuits used in commercial and industrial applications using the National Electric Code.
20. Calculate the correct size of conduit needed for commercial and industrial applications.
21. Install, test, and troubleshoot AC motors, DC motors, alternators, and generators.
22. Design and wire motor control circuits using pushbuttons, limit switches, sensors, motor starters, relays, overloads, and over current protection devices.
23. Solve algebraic equations using techniques which include signed numbers, scientific notation, algebraic expressions, linear equations, and systems of equations.
24. Calculate solutions for right triangles using trigonometric functions and Pythagorean Theorem.

Industrial Electrician Specialization and Diploma

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.

5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Design a resonant circuit.
13. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
14. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
15. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
16. Calculate and size wire using the National Electrical Code for residential applications'
17. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
18. Install different type of conduit systems using the correct installation criteria for the type of conduit chosen in commercial and industrial applications.
19. Compute the size of conductors needed in circuits used in commercial and industrial applications using the National Electric Code.
20. Calculate the correct size of conduit needed for commercial and industrial applications.
21. Install, test, and troubleshoot AC motors, DC motors, alternators, and generators.
22. Design and wire motor control circuits using pushbuttons, limit switches, sensors, motor starters, relays, overloads, and over current protection devices.
23. Install, test, and troubleshoot variable frequency drives.
24. Install a programmable logic controller to control a motor.
25. Program a programmable controller to control a motor.
25. Troubleshoot a motor controls circuit using programmable logic controllers.
26. Solve algebraic equations using techniques which include signed numbers, scientific notation, algebraic expressions, linear equations, and systems of equations.
27. Calculate solutions for right triangles using trigonometric functions and Pythagorean Theorem.

Motor Controls Specialization and Diploma

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Design a resonant circuit.
13. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
14. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
15. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
16. Calculate and size wire using the National Electrical Code for residential applications.

17. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
18. Install different type of conduit systems using the correct installation criteria for the type of conduit chosen in commercial and industrial applications.
19. Compute the size of conductors needed in circuits used in commercial and industrial applications using the National Electric Code.
20. Calculate the correct size of conduit needed for commercial and industrial applications.
21. Install, test, and troubleshoot AC motors, DC motors, alternators, and generators.
22. Design and wire motor controls circuits using pushbuttons, limit switches, sensors, motor starters, relays, overloads, and over current protection devices.
23. Install, test, and troubleshoot variable frequency drives.
24. Install a programmable logic controller to control a motor.
25. Program a programmable controller to control a motor.
26. Troubleshoot a motor controls circuit using programmable logic controller.
27. Solve algebraic equations using techniques which include signed numbers, scientific notation, algebraic expressions, linear equations, and systems of equations
28. Calculate solutions for right triangles using trigonometric functions and Pythagorean Theorem.
29. Install, test, and troubleshoot components used in fluid power circuits.
30. Repair components used in fluid power circuits.

Certificate: Electrician Apprentice

Upon completion of this program, the graduate can:

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Design a resonant circuit.
13. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
14. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
15. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
16. Calculate and size wire using the National Electrical Code for residential applications.
17. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
18. Install different type of conduit systems using the correct installation criteria for the type of conduit chosen in commercial and industrial applications.
19. Compute the size of conductors needed in circuits used in commercial and industrial applications using the National Electric Code.
20. Calculate the correct size of conduit needed for commercial and industrial applications.
21. Install, test, and troubleshoot AC motors, DC motors, alternators, and generators.
22. Design and wire motor controls circuits using pushbuttons, limit switches, sensors, motor starters, relays, overloads, and over current protection devices.

Certificate: Electrical Construction

Upon completion of this program, the graduate can:

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Design a resonant circuit.
13. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
14. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
15. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
16. Calculate and size wire using the National Electrical Code for residential applications.
17. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
18. Install different type of conduit systems using the correct installation criteria for the type of conduit chosen in commercial and industrial applications.
19. Compute the size of conductors needed in circuits used in commercial and industrial applications using the National Electric Code.
20. Calculate the correct size of conduit needed for commercial and industrial applications.
21. Install, test, and troubleshoot AC motors, DC motors, alternators, and generators.
22. Design and wire motor controls circuits using pushbuttons, limit switches, sensors, motor starters, relays, overloads, and over current protection devices.

Certificate: Electrician Trainee Level I

Upon completion of this program, the graduate can:

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.

Certificate: Electrician Trainee Level II

Upon completion of this program, the graduate can:

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.

9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Design a resonant circuit.

Certificate: Residential Electricity Level I

Upon completion of this program, the graduate can:

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Design a resonant circuit.
13. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
14. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
15. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
16. Calculate and size wire using the National Electrical Code for residential applications.
17. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.

Certificate: Residential Electricity Level II

Upon completion of this program, the graduate can:

Technical Competencies

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Design a resonant circuit.
13. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
14. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
15. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
16. Calculate and size wire using the National Electrical Code for residential applications.

17. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
18. Install different type of conduit systems using the correct installation criteria for the type of conduit chosen in commercial and industrial applications.
19. Compute the size of conductors needed in circuits used in commercial and industrial applications using the National Electric Code
20. Calculate the correct size of conduit needed for commercial and industrial applications

Certificate: Electrical Motor Control Level I

Upon completion of this program, the graduate can:

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Design a resonant circuit.
13. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
14. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
15. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
16. Calculate and size wire using the National Electrical Code for residential applications.
17. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
18. Install different type of conduit systems using the correct installation criteria for the type of conduit chosen in commercial and industrial applications.
19. Compute the size of conductors needed in circuits used in commercial and industrial applications using the National Electric Code.
20. Calculate the correct size of conduit needed for commercial and industrial applications.
21. Install, test, and troubleshoot AC motors, DC motors, alternators, and generators.
22. Design and wire motor controls circuits using pushbuttons, limit switches, sensors, motor starters, relays, overloads, and over current protection devices.
23. Demonstrate basic skills in computer operations and/or software applications.

Certificate: Electrical Motor Control Level II

Upon completion of this program, the graduate can:

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.

9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Design a resonant circuit.
13. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
14. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
15. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
16. Calculate and size wire using the National Electrical Code for residential applications.
17. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
18. Install different type of conduit systems using the correct installation criteria for the type of conduit chosen in commercial and industrial applications.
19. Compute the size of conductors needed in circuits used in commercial and industrial applications using the National Electric Code.
20. Calculate the correct size of conduit needed for commercial and industrial applications.
21. Install, test, and troubleshoot AC motors, DC motors, alternators, and generators.
22. Design and wire motor controls circuits using pushbuttons, limit switches, sensors, motor starters, relays, overloads, and over current protection devices.
23. Demonstrate basic skills in computer operations and/or software applications.
24. Install, test, and troubleshoot variable frequency drives.
25. Install a programmable logic controller to control a motor.
26. Program a programmable controller to control a motor.
27. Troubleshoot a motor controls circuit using programmable logic controllers.

Certificate: Voice and Data Wiring Installer Level I

Upon completion of this program, the graduate can:

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
13. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
14. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
15. Calculate and size wire using the National Electrical Code for residential applications.
16. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
17. Demonstrate basic skills in computer operations and/or software applications.
18. Pull backbone (UTP/ScTP/STP/STP-A) in compliance with industry standards whether it is a horizontal or vertical pull.
19. Perform cabling installation methods using standards such as ANSI/TIA/EIA-568-A, 606, 607 and the National Electrical Code for cables used in the voice and data industry.

Certificate: Voice and Data Wiring Installer Level II

Upon completion of this program, the graduate can:

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
13. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
14. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.
15. Calculate and size wire using the National Electrical Code for residential applications.
16. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
17. Demonstrate basic skills in computer operations and/or software applications.
18. Pull backbone (UTP/Scup/STP/STP-A) in compliance with industry standards whether it is a horizontal or vertical pull.
19. Perform cabling installation methods using standards such as ANSI/TIA/EIA-568-A, 606, 607 and the National Electrical Code for cables used in the voice and data industry.
20. Design and install standards based wiring closets, which will include: determining equipment layout, mounting and installing backboards, cross-connects, racks, patch panels, and fiber optical panels and hardware.
21. Install and test copper and fiber optic cable.

Certificate: Voice and Data Wiring Technician

Upon completion of this program, the graduate can:

Technical Competencies:

1. Compute resistance, current, voltage, and power in alternating circuits (AC) and direct current (DC).
2. Connect a digital multi-meter to measure resistance, current, and voltage.
3. Apply proper safety practices when working with electrical circuits.
4. Solve electrical circuits using Ohm's Law.
5. Analyze, construct, and troubleshoot series circuits, parallel circuits, series-parallel circuits, capacitor circuits, and inductor circuits.
6. Connect an oscilloscope to measure voltage and frequency.
7. Identify and use basic hand tools.
8. Compute and measure conductance and resistance of conductors and insulators.
9. Solve circuits using Kirchhoff's Laws, Norton's Theorem, Superposition Theorem, and Thevenin's Theorem.
10. Connect and measure current and voltage for a single-phase transformer.
11. Connect and measure current and voltage for a three-phase transformer.
12. Install and design circuits used in residential applications that meet the requirements of the local code or National Electric Code whichever is applicable.
13. Install receptacles, ground fault circuit interrupters, lighting fixtures, smoke alarms, and appliance circuits.
14. Install circuit breakers, arc fault circuit breakers, meter bases, service entrance equipment, underground services, and overhead services.

15. Calculate and size wire using the National Electrical Code for residential applications.
16. Install cables and wire used in residential applications using the appropriate wiring methods for the wire or cable being used.
17. Demonstrate basic skills in computer operations and/or software applications.
18. Pull backbone (UTP/Scup/STP/STP-A) in compliance with industry standards whether it is a horizontal or vertical pull.
19. Perform cabling installation methods using standards such as ANSI/TIA/EIA-568-A, 606, 607 and the National Electrical Code for cables used in the voice and data industry.
20. Design and install standards based wiring closets, which will include: determining equipment layout, mounting and installing backboards, cross-connects, racks, patch panels, and fiber optical panels and hardware.
21. Install and test copper and fiber optic cable.
22. Plan a job and estimate the cost of the job by doing a site survey.
23. Install cabling using different network configuration methods.
24. Estimate a project completion date by using GANTT/PERT project charts.

Outlines:

AAS in Electrical Technology

General Education:

ENG	101	Writing I	3
MT	115	Technical Mathematics OR	3
MT	125	Technical Algebra & Trigonometry OR	(3)
		Higher Level Mathematics Course	(3)
		Science	3
		Social Interaction	3
		Heritage/Humanities	3
		Oral Communication	3
		Subtotal	**18**

Technical Core:

ENGT	110	Circuits I	5
ENGT	114	Circuits II	5
EET	250	National Electric Code	4
EET	264	Rotating Machinery	2
EET	265	Rotating Machinery Lab	2
EET	270	Electrical Motor Controls I	2
EET	271	Electrical Motor Controls I Lab	2
		Computer Literacy OR	3
		If any student successfully tests out of Computer Literacy he/she must take an additional Technical Course approved by the Electrical Program Coordinator.	(3)
		Subtotal	**25**

Industrial Electrician Specialization:

EET	154	Electrical Construction I AND	2
EET	155	Electrical Construction I Lab AND	2
EET	252	Electrical Construction II AND	2
EET	253	Electrical Construction II Lab OR	2
EET	254	Electrical Construction AND	(3)
EET	255	Electrical Construction Lab	(4)
EET	272	Electrical Motor Controls II AND	2
EET	273	Electrical Motor Controls II Lab AND	2
EET	276	Programmable Logic Controllers AND	2
EET	277	Programmable Logic Controllers Lab OR	2
EET	278	Electrical Motor Controls II and PLCs AND	(3)
EET	279	Electrical Motor Controls II and PLCs Lab	(4)

		Technical Electives*	9
		Subtotal	**23-25**
		Total Credits	**66-68**

Construction Electrician Specialization:

EET	154	Electrical Construction I AND	2
EET	155	Electrical Construction I Lab AND	2
EET	252	Electrical Construction II AND	2
EET	253	Electrical Construction II Lab OR	2
EET	254	Electrical Construction AND	(3)
EET	255	Electrical Construction Lab	(4)
		Technical Electives*	10
		Subtotal	**17-18**
		Total Credits	**60-61**

Motor Controls Electrician Specialization:

EET	272	Electrical Motor Controls II AND	2
EET	273	Electrical Motor Controls II Lab AND	2
EET	276	Programmable Logic Controllers AND	2
EET	277	Programmable Logic Controllers Lab OR	2
EET	278	Electrical Motor Controls II and PLC's AND	(3)
EET	279	Electrical Motor Controls II and PLC's Lab	(4)
FPX	100	Fluid Power AND	3
FPX	101	Fluid Power Lab OR	2
ET	265	Applied Fluid Power	(3)
		Technical Electives*	7
		Subtotal	**17-20**
		Total Credits	**60-63**

Technical Electives*:

This list is not all-inclusive. Other courses may be taken with approval of the program instructor/advisor.

FPX	100	Fluid Power	3
FPX	101	Fluid Power Lab	2
ETT	110	Voice and Data Installer Level 1	4
ETT	112	Basic Electrical Theory	3
EET	113	Basic Electrical Theory Lab	1
ETT	114	Voice and Data Installer Level II	4
ETT	116	Fiber Optics Systems	3
ETT	118	Residential Network Wiring	3
EET	120	Project Management	3
EET	122	Voice and Data Installer Technician	3
ETT	123	Voice and Data Installer Technician Lab	2
ETT	199	Cooperative Education for Voice and Data Wiring Technician	3
EET	102	Advanced Mathematics for Electronics	2
EET	116	Web Page Design	3
EET	118	Internet Applications for Computer Servicing	3
EET	148	Electronic Drafting	3
EET	150	Transformers	2
EET	151	Transformers Lab	1
EET	152	Electrical Drafting	2
EET	154	Electrical Construction I	2
EET	155	Electrical Construction I Lab	2
EET	160	Mathematics for Electronics/Electricity	5
EET	198	Practicum	2
EET	199	Cooperative Education Program	2
EET	200	Digital Electronics	3

EET	201	Digital Electronics Lab	2
EET	202	Microprocessors	3
EET	203	Microprocessors Lab	2
EET	204	Digital Systems and Microprocessors	6
EET	205	Digital Systems and Microprocessors Lab	4
EET	208	Electronic Communications I	3
EET	209	Electronic Communications I Lab	2
EET	210	Electronic Communications II	3
EET	211	Electronic Communications II Lab	2
EET	212	Electronic Communications	6
EET	213	Electronic Communications Lab	4
EET	214	Television and Radio Systems	6
EET	215	Television and Radio Systems Lab	4
EET	216	Computer Electronics Fundamentals	3
EET	217	Computer Electronics Fundamentals Lab	2
EET	218	Computer Applications I	3
EET	219	Computer Applications I Lab	2
EET	220	Computer Repair and Servicing Technology I	3
EET	221	Computer Repair and Servicing Technology I Lab	2
EET	222	Computer Repair and Servicing Technology II	3
EET	223	Computer Repair and Servicing Technology II Lab	2
EET	224	Computer Repair and Servicing Technology	6
EET	225	Computer Repair and Servicing Technology Lab	4
EET	236	Network Essentials	3
EET	237	Network Essentials Lab	2
EET	242	Robotics	3
EET	243	Robotics Lab	2
EET	244	Advanced Electronic Application	6
EET	250	National Electric Code	4
EET	252	Electrical Construction II	2
EET	254	Electrical Construction	3
EET	255	Electrical Construction Lab	4
EET	256	Polyphase Power Calculations	2
EET	258	Manufactured Housing	2
EET	260	Home Automated Technology	2
EET	264	Rotating Machinery	2
EET	265	Rotating Machinery Lab	2
EET	266	Rotating Machinery and Transformers	3
EET	267	Rotating Machinery and Transformers Lab	3
EET	268	Rotating Machinery Electrical Motor Controls I	3
EET	269	Rotating Machinery and Motor Controls I Lab	4
EET	270	Electrical Motor Controls I	2
EET	271	Electrical Motor Controls I Lab	2
EET	272	Electrical Motor Controls II	2
EET	273	Electrical Motor Controls II Lab	2
EET	274	Electrical Motor Controls	3
EET	275	Electrical Motor Controls Lab	4
EET	276	Programmable Logic Controllers	2
EET	277	Programmable Logic Controllers Lab	2
EET	278	Electrical Motor Controls II and PLCs	3
EET	279	Electrical Motor Controls II and PLCs Lab	4
EET	281	Special Problems I	1
EET	283	Special Problems II	2
EET	284	Special Problems III	3
EET	286	Programmable Logic Controllers II	2
EET	287	Programmable Logic Controllers II Lab	2

EET	298	Practicum	1-8
EET	299	Cooperative Education Program	1-8
MGX	220	Rotating Machinery	3
MGX	221	Rotating Machinery Lab	2
BRX	110	Basic Blueprint Reading for Machinist	2
BRX	112	Blueprint Reading for Machinist	4
BRX	120	Basic Blueprint Reading	3
BRX	210	Mechanical Blueprint Reading for Machinist	2
BRX	220	Blueprint Reading for Construction	3
BRX	230	Mechanical Blueprint Reading	3
BEX	100	Basic Electricity for Non-Majors	3
BEX	101	Basic Electricity Lab for Non-Majors	2
FEX	100	Fundamentals of Electricity for Non-Majors	3
ET	102	Blueprint Reading	2
ET	106	Mechanical Engineering Graphics II	2
ET	107	Computer Applications for Technicians	4
ET	112	Digital Logic Circuits	4
ET	113	Laser Optics Components	3
ET	118	Manufacturing III, Computer Numerical Control	3
ET	119	Introduction to Computer –Aided Manufacturing	3
ET	122	Mechanical Power Transmission Systems	3
ET	123	Mining Electricity I	4
ET	124	Mechanical Power Transmission Systems Lab	1
ET	146	Statics	3
ET	155	Elements of Underground and Surface Mining	3
ET	201	Statics and Strength of Materials	4
ET	210	Thermodynamic Applications	3
ET	232	Computer Software Maintenance	3
ET	234	Computer Hardware Maintenance	3
ET	241	Electronics I	4
ET	243	Electric Power Distribution	3
ET	244	Electrical Machinery and Controls	4
ET	245	Electrical Machinery	3
ET	250	Programmable Logic Controllers	4
ET	251	Electronics II	4
ET	252	Electric Power Systems	3
ET	256	Microprocessor Fundamentals	4
ET	257	Practicum in Computer Repair	6
ET	260	Fluid Flow and Heat Transfer	5
ET	261	Instrumentation and Measurements	3
ET	262	Measurement and Instrumentation	4
ET	264	Mechanical Design	4
ET	265	Applied Fluid Power	3
ET	286	Roof Control and Ventilation	3
ET	290	Selected Topics in Engineering Technology: (Topic)	1-4
ET	295	Independent Problems	1-2
LCX	120	Programmable Logic Controllers	2
ME	105	Basic Engineering Graphics	2
ME	205	Introduction to Computer Graphics	3
ME	152	Engineering Thermodynamics I	3
WLD	220	Basic Welding B	5

Diploma
Electrical Technology

General Education:

Area 1	Writing/ Accessing Information or	3

		Heritage/ Humanities	(3)
		Oral Communication	(3)
Area 2			
MT	115	Technical Mathematics OR	3
MT	125	Technical Algebra & Trigonometry OR	(3)
		Higher Level Mathematics Course	(3)
* Area 3		*Computer Literacy Course OR If any student successfully tests out of Computer Literacy he/she must take an additional Technical Course approved by the Electrical Program Coordinator. (Credits in Technical Core)	
		Subtotal	**6**

Technical Core:

ENGT	110	Circuits I	5
ENGT	114	Circuits II	5
EET	250	National Electric Code	4
EET	264	Rotating Machinery	2
EET	265	Rotating Machinery Lab	2
EET	270	Electrical Motor Controls I	2
EET	271	Electrical Motor Controls I Lab	2
		*Computer Literacy OR	3
		If any student successfully tests out of Computer Literacy he/she must take an additional Technical Course approved by the Electrical Program Coordinator	(3)
		Subtotal	**25**

Diploma:
Industrial Electrician

EET	154	Electrical Construction I AND	2
EET	155	Electrical Construction I Lab AND	2
EET	252	Electrical Construction II AND	2
EET	253	Electrical Construction II Lab OR	2
EET	254	Electrical Construction AND	(3)
EET	255	Electrical Construction Lab	(4)
EET	272	Electrical Motor Controls II AND	2
EET	273	Electrical Motor Controls II Lab AND	2
EET	276	Programmable Logic Controllers AND	2
EET	277	Programmable Logic Controllers Lab OR	2
EET	278	Electrical Motor Controls II and PLCs AND	(3)
EET	279	Electrical Motor Controls II and PLCs Lab	(4)
		Technical Electives*	9
		Subtotal	**23-25**
		Total Credits	**54-56**

Construction Electrician

EET	154	Electrical Construction I AND	2
EET	155	Electrical Construction I Lab AND	2
EET	252	Electrical Construction II AND	2
EET	253	Electrical Construction II Lab OR	2
EET	254	Electrical Construction AND	(3)
EET	255	Electrical Construction Lab	(4)
		Technical Electives*	10
		Subtotal	**17-18**

		Total Credits	**48-49**

Motor Controls Electrician

EET	272	Electrical Motor Controls II AND	2
EET	273	Electrical Motor Controls II Lab AND	2
EET	276	Programmable Logic Controllers AND	2
EET	277	Programmable Logic Controllers Lab OR	2
EET	278	Electrical Motor Controls II and PLC's AND	(3)
EET	279	Electrical Motor Controls II and PLC's Lab	(4)
FPX	100	Fluid Power AND	3
FPX	101	Fluid Power Lab OR	2
ET	265	Applied Fluid Power	(3)
		Technical Electives*	7
		Subtotal	**17-20**
		Total Credits	**48-51**

Certificate: Electrical Construction

ENGT	110	Circuits I	5
ENGT	114	Circuits II	5
EET	150	Transformers	2
EET	151	Transformers Lab	1
EET	250	National Electric Code	4
EET	154	Electrical Construction I AND	2
EET	155	Electrical Construction I Lab AND	2
EET	252	Electrical Construction II AND	2
EET	253	Electrical Construction II Lab OR	2
EET	254	Electrical Construction AND	(3)
EET	255	Electrical Construction Lab	(4)
EET	264	Rotating Machinery AND	2
EET	265	Rotating Machinery Lab AND	2
EET	270	Electrical Motor Controls I AND	2
EET	271	Electrical Motor Controls I Lab OR	2
EET	268	Rotating Machinery Electrical Motor Controls I AND	(3)
EET	269	Rotating Machinery Electrical Motor Controls I Lab	(4)
		Total Credits	**31-33**

Electrician Trainee Level I

ENGT	110	Circuits I	5
		Technical Electives	3
		Total Credits	**8**

Electrician Trainee Level II

ENGT	110	Circuits I	5
ENGT	114	Circuits II	5
		Technical Electives	3
		Total Credits	**13**

Residential Electricity Level I

ENGT	110	Circuits I	5
ENGT	114	Circuits II	5
EET	154	Electrical Construction I	2
EET	155	Electrical Construction I Lab	2
		Total Credits	**14**

Residential Electricity Level II

ENGT	110	Circuits I	5
ENGT	114	Circuits II	5
EET	154	Electrical Construction I AND	2
EET	155	Electrical Construction I Lab AND	2
EET	252	Electrical Construction II AND	2
EET	253	Electrical Construction II Lab OR	2
EET	254	Electrical Construction AND	(3)
EET	255	Electrical Construction Lab	(4)
EET	250	National Electrical Code	4
		Total Credits	**21-22**

Electrical Motor Control Level I

ENGT	110	Circuits I	5
ENGT	114	Circuits II	5
EET	150	Transformers AND	2
EET	151	Transformers Lab AND	1
EET	264*	Rotating Machinery AND	2
EET	265*	Rotating Machinery Lab OR	2
EET	266	Rotating Machinery and Transformers AND	(3)
EET	267	Rotating Machinery and Transformers Lab	(3)
EET	250	National Electrical Code	4
EET	270	Electrical Motor Controls I AND	2
EET	271	Electrical Motor Controls I Lab AND	2
EET	264*	Rotating Machinery AND	(2)
EET	265*	Rotating Machinery Lab OR	(2)
EET	268	Rotating Machinery Electrical Motor Controls I AND	(3)
EET	269	Rotating Machinery Electrical Motor Controls I Lab	(4)
CPU	150	Computer Fundamentals OR	3
CIS	100	Introduction to Computers	(3)
		Total Credits	**28-30**

*May be offered in different combinations.

Electrical Motor Control Level II

ENGT	110	Circuits I	5
ENGT	114	Circuits II	5
EET	150	Transformers AND	2
EET	151	Transformers Lab AND	1
EET	264*	Rotating Machinery AND	2
EET	265*	Rotating Machinery Lab OR	2
EET	266	Rotating Machinery and Transformers AND	(3)
EET	267	Rotating Machinery and Transformers Lab	(3)
EET	250	National Electrical Code	4
EET	264*	Rotating Machinery AND	(2)
EET	265*	Rotating Machinery Lab AND	(2)
EET	270	Electrical Motor Controls I AND	2
EET	271	Electrical Motor Controls I Lab OR	2
EET	268	Rotating Machinery Electrical Motor Controls I AND	(3)
EET	269	Rotating Machinery Electrical Motor Controls I Lab	(4)
EET	272	Electrical Motor Controls II AND	2
EET	273	Electrical Motor Controls II Lab AND	2
EET	276	Programmable Logic Controllers AND	2
EET	277	Programmable Logic Controllers Lab OR	2
EET	278	Electrical Motor Controls II and PLCs AND	(3)
EET	279	Electrical Motor Controls II and PLCs Lab	(4)

CPU	150	Computer Fundamentals OR	3
CIS	100	Introduction to Computers	(3)
		Total Credits	**35-38**

* May be offered in different combinations.

Voice and Data Wiring Installer Level II

EET	252	Electrical Construction II	2
EET	253	Electrical Construction II Lab	2
ETT	114	Voice and Data Installer Level 2	4
ETT	116	Fiber Optics Systems	3
ETT	118	Residential Network Wiring	3
		Total Credits	**14**

Voice and Data Wiring Installer Level I

		Computer Literacy Course	3
EET	154	Electrical Construction I	2
EET	155	Electrical Construction I Lab	2
ETT	110	Voice and Data Installer Level 1	4
ETT	112	Basic Electrical Theory	3
ETT	113	Basic Electrical Theory Lab	1
		Total Credits	**15**

Voice and Data Wiring Technician

ETT	120	Project Management	3
ETT	122	Voice and Data Installer Technician	3
ETT	123	Voice and Data Installer Technician Lab	2
ETT	199	Cooperative Education for Voice and Data Wiring Technicians	3
		Total Credits	**11**

Dates of Actions:
Approved:
Revised: 1999, 2004, May 2007