



COURSE OUTLINE : ECT 161
D Credit – Degree Applicable
COURSE ID 010112
Cyclical Review: September 2020

COURSE DISCIPLINE : ECT
COURSE NUMBER : 161
COURSE TITLE (FULL) : Residential Electronics Systems Integrator (RESI) Training
COURSE TITLE (SHORT) : RESI Training

CATALOG DESCRIPTION

ECT 161 is an introduction to the Residential Electronics Systems Integrator (RESI). Topics include the design of rewiring for home theater and telecommunications equipment interconnection, network installation, and wiring for cable television, satellite and antenna outlets, telephone equipment outlets, audio and video entertainment, and computer equipment. Students may become certified by the Electronics Technician Association (ETA) International by passing the knowledge examination assessment and obtaining RESI BASIC skills and knowledge.

Total Lecture Units: 3.00

Total Laboratory Units: 0.00

Total Course Units: 3.00

Total Lecture Hours: 54.00

Total Laboratory Hours: 0.00

Total Laboratory Hours To Be Arranged:0.00

Total Contact Hours: 54.00

Total Out-of-Class Hours: 108.00

Recommended Preparation: ECT 110 or equivalent.



ENTRY STANDARDS

	Subject	Number	Title	Description	Include
1	ECT	110	Electricity and Electronics Principles	Describe basic laboratory equipment and components;	Yes
2	ECT	110	Electricity and Electronics Principles	determine the value of resistors from their color code, measure DC (Direct Current) and AC (Alternating Current) voltage;	Yes
3	ECT	110	Electricity and Electronics Principles	identify conductors and insulators, and test common types of switches;	Yes
4	ECT	110	Electricity and Electronics Principles	measure current in a circuit, verify ohms law, investigate errors in measurement;	Yes
5	ECT	110	Electricity and Electronics Principles	design a series and parallel circuit that will meet specified resistance requirements;	Yes
6	ECT	110	Electricity and Electronics Principles	develop a general rule for calculating the voltage across each resistor in an unloaded and loaded resistive voltage divider;	Yes
7	ECT	110	Electricity and Electronics Principles	develop methods of troubleshooting circuits using voltage, current, capacitor and resistance measurements;	Yes
8	ECT	110	Electricity and Electronics Principles	identify the operating controls of an oscilloscope;	Yes
9	ECT	110	Electricity and Electronics Principles	identify the controls and features of an audio frequency generator;	Yes
10	ECT	110	Electricity and Electronics Principles	describe the effect of AC and DC electrical motors and inductance;	Yes
11	ECT	110	Electricity and Electronics Principles	identify and measure affect transformers and magnetic relays and contactors.	Yes

EXIT STANDARDS

- 1 Describe Occupational Safety and Health Administration (OSHA) rules, National Electrical Code (NEC) and National Fire Protection Code (NFPC);
- 2 describe the Residential Low-voltage Industry Standard;
- 3 use residential electrical blueprints;
- 4 install Unshielded Twisted Pair (UTP), Category (CAT) 5e and 6 fittings;
- 5 describe inductive signals and surface mount channeling;
- 6 calculate formulas related to power generation;



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- 7 explain power generators and electrical service to residences;
- 8 describe analog and digital telephone systems;
- 9 demonstrate the use of fiber optic connectors and splice methods;
- 10 use trade tools and equipment;
- 11 identify and explain troubleshooting methods.

STUDENT LEARNING OUTCOMES

- 1 recognize the skills required for low voltage wiring installation
- 2 identify the components required for use in residential wiring and components installation
- 3 demonstrate the use of trade tools and equipment required for low-voltage wire and component installation
- 4 describe the process required by ETA International to be RESI BASIC Skills and Knowledge certified

COURSE CONTENT WITH INSTRUCTIONAL HOURS

	Description	Lecture	Lab	Total Hours
1	Safety <ul style="list-style-type: none"> • Tasks performed by trained first aid workers • Electricity lethality to humans • OSHA body restraint rules • Use of ladders and working at heights • Technician adherence to NEC and NFPC codes • Usage of the Residential Electrical Maintenance Code (REMC) 	5	0	5
2	Industry Standards <ul style="list-style-type: none"> • Telecommunication Industry Association (TIA) 570-A • Cabling components and methods addressed by TIA/Electronics Industry Alliance (EIA)-568-A, TIA/EIA-568-B, and American National Standards Institute (ANSI)/TIA-568-C • Telcordia standards related to cabling • Cable pair colors and applicable TIA/EIA standards 	4	0	4



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3	<p>Low Voltage Wiring</p> <ul style="list-style-type: none"> • Use of electrical blue prints and adherence to specifications • American Wire Gauge (AWG) standards • Governmental permits required for low voltage wiring • Low voltage lighting • Usage • Precautions • Audio signal and speaker cabling and wiring • CAT 5e and 6 UTP cables and preferred usages • Control and sensor wiring • Home automation • Manual operation 	5	0	5
4	<p>Cabling and Connectors</p> <ul style="list-style-type: none"> • Copper coax • Plastic optical fiber • 66 or 110 block panels • Distribution • Interface center for telecom services • Patch cabling • Workstation cables • Backbone/distribution cabling • Comparison to link, workstation and patch cables • Composite and Hybrid Cables • Cable prepping tools and techniques • Types of signal losses in cables • Purpose of matching correct impedances • Converting dB levels to microvolt levels • Installation of F coaxial cable fittings • Installation of UTP, CAT 5e and 6 fittings • Ground loops in electrical circuits 	6	0	6



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5	<p>Prewiring</p> <ul style="list-style-type: none"> • Roughing-in cabling • Biscuit jacks/surface mount boxes • Wall plates • Location inside structure • J-hooks and cable trays • Inductive signals and interference • Effects and precautions • Separation distances for cabling • Stranded vs. solid wiring • Detriments in exceeding TIA/EIA Tensile Strength/Bend Ratios • Wiring labeling • Purposes • How applied • Methods to estimate cable requirements for individual applications • UTP untwist precautions • NEXT/FEXT • Problems associated with coaxial cable installation or repair • Surface mount channeling 	5	0	5
6	<p>Electrical Basics</p> <ul style="list-style-type: none"> • Calculations used for Ohm's Law, E, I, R & W formulas • Electric power generators and service • Wire size choices and distribution • Fuse and circuit breaker boxes components • Electrical meters • DC and AC • Electric circuit grounding and NEC rules • Lightning • Hazards • Arrestors • Ground blocks • Comparison of AC power, voice, radio, TV and data frequencies • Causes and methods of reducing electrical interference 	5	0	5



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7	<p>Telephone Systems</p> <ul style="list-style-type: none"> • Basic telephone circuit • Tip and Ring • Wiring conventions in POTS systems • Expected voltages on telephone plugs • Conventional color of UTP wires used with 2/4/8 wire connections • Comparison of Analog and Digital telephone systems • Punch Down Blocks – 66/110 • Differences between Internet - Cable TV –Wireless Systems and B-VoIP • Problems associated with telephone systems • Repair solutions 	4	0	4
8	<p>Fiber Optics</p> <ul style="list-style-type: none"> • Eye, skin and inhalation safety precautions • Basic light theory • Commonly used wavelengths/frequencies • Connector and splice methods and testing • Differences between glass and plastic optical fiber 	3	0	3
9	<p>Residential Management</p> <ul style="list-style-type: none"> • Bar coding and modern inventory control methods • Manual, automatic and programmable appliances control 	2	0	2
10	<p>Premises Restoration</p> <ul style="list-style-type: none"> • Drywall penetrations of walls and ceilings • Restoration techniques and materials used 	2	0	2
11	<p>Tools & Equipment</p> <ul style="list-style-type: none"> • Usage of Volt/Ohm/Amp multimeters • Wire strippers, crimps, punch-down tool & fish tapes • Gopher poles, drills/bits, scissors and face mask • Toner and light meter/source • Installation of F connector using compression tool • Use of wire pull lubricant • Usage and safety concerns for hand & power tools • Cable markers • Identification of wires that have no markers 	4	0	4
12	<p>Customer Orientation & Documentation</p> <ul style="list-style-type: none"> • Customer/owner relations • Problem prevention • Conflict resolution concepts 	5	0	5
13	<p>Troubleshooting</p> <ul style="list-style-type: none"> • Divide & conquer troubleshooting method • Common problems and solutions in residential cabling • Sources of on-line and phone technical help from product makers and suppliers 	4	0	4

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OUT OF CLASS ASSIGNMENTS

- 1 field trip (e.g. visit IT department of a federal or state building);
- 2 projects (e.g. projects consisting of instructions to complete various tutorials);
- 3 problems (e.g. low voltage circuit analyses).

METHODS OF EVALUATION

- 1 quizzes;
- 2 midterm examination;
- 3 final examination.

METHODS OF INSTRUCTION

- Lecture
- Laboratory
- Studio
- Discussion
- Multimedia
- Tutorial
- Independent Study
- Collaboratory Learning
- Demonstration
- Field Activities (Trips)
- Guest Speakers
- Presentations

TEXTBOOKS

Title	Type	Publisher	Edition	Medium	Author	ISBN	Date
Understanding NEC Requirements for Limited Energy & Communications Systems	Required	Mike Holt Enterprises		print	Holt, Mike	9781932685688	2017