

NRLT Curriculum Crosswalk					COURSE #	COURSE TITLE	LEC	LAB	Page #
I. SAFETY									
I-A General jobsite safety awareness									
1) Why safety is important									
2) Key factors involved with safe work practices									
3) Develop a respect for electricity									
a) be aware of dangers of shock									
b) describe locations of potential shock hazards									
c) demonstrate use of Multi-Meter and other devices to determine if the system is energized									
d) demonstrate techniques for working on energized circuits									
4) Hazards created by poor housekeeping on the job									
5) Maintain safe work area and tools									
6) Be aware of the dangers of falling objects									
7) Respect and obey job safety rules									
8) Look up and Live (High Voltage above)									
I-B. Emergency procedures									
1) First aid training and CPR									
2) Accident Reporting									
I-C. Compliance with OSHA 10 and EPA regulations									
1) Attend and/or conduct regular safety meeting									
2) General OSHA requirements on the jobsite									
a) OSHA 10									
3) The guidelines for OSHA Assured Grounding and GFI usage									
4) Use of material safety data sheets (MSDS) to identify and properly handle hazardous materials(e.g. cleaning fluids, PCB Ballast and Universal Waste (Lamps)									

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I-D.	Substance abuse								
I-E.	PPE (Personal Protective Equipment)								
	A. Purpose and Use of PPE (LAB Emphasis)						less	more	
	1) Gloves								
	2) Safety Glasses								
	3) Hard Hats								
	4) Boots								
	5) Reflective								
	6) Fall Protection								
	7) Lock-out Tag-out								
I-F.	AERIAL EQUIPMENT (LAB Emphasis)						less	more	
	1) Ladder								
	2) Rolling Scaffolding								
	3) Scissor Lifts								
	4) Aerial Lifts								
II.	MATH								
II-A	Appropriate mathematical calculations to solve for unknowns								
	1) Arithmetic operators								
	2) Problems involving fractions								
	3) Reducing fractions to lowest terms								
	4) Wattage and Amperage used by Luminaires and Lamps								
III.	ELECTRICAL THEORY								
III-A.	Basic electrical theory								

1) Define terms, units of measure									
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2) Electron flow									
3) Producing electrical current									
4) Products (effects of electrical current)									
Grounding and GFI usage									
III-B. Ohm's Law									
III-C. Series circuits									
1) Components									
III-D. Parallel circuits									
1) Components									
2) Differences between series and parallel circuits									
3) Ohm's Law									
V. CODE REQUIREMENTS									
V-A. National Electrical Code and local code									
1) Purpose and intent of electrical codes									
2) Scope on NEC (NFPA 70)									
3) How local codes may differ from NEC									
4) Using and Navigating the NEC									
5) Title 24 Lighting Requirements (Part 6)									
VI. CONDUCTORS									
VI-A. Various types of conductors (LIGHTING)									
1) Types of conductors and insulators									
2) Why some materials are better conductors or insulators than others									
3) Effect of heat on insulators									
4) Sizing conductors									

a) Use American wire gauge chart								
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VII. CONDUIT, RACEWAYS								
a) Terms associated with conduits and raceways								
b) Terms associated with lighting panels								
VIII. FUNDAMENTALS OF LIGHTING								
a) Visually perceived radiant light								
b) CRI - Color rendering index								
IX. LIGHTING SYSTEMS (LAB Emphasis)								
IX-A. Function, operation and characteristics lamps								
1) Incandescent								
2) Fluorescent								
3) High Intensity Discharge								
4) Induction lamps								
5) Neon								
6) LED								
IX-B. Function, operation and characteristics of ballast, drivers and transformers								
1) Fluorescent Ballast								
2) High Intensity discharge ballast								
3) LED Drivers								
4) Neon Transformers								
5) Induction Drivers								
6) Low voltage lighting transformers (Track lighting)								
LIGHTING CONTROLS (LAB Emphasis)								
X-A. Function, operation and characteristics of lighting controls								

1) Occupancy Sensors									
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					COURSE #	COURSE TITLE	LEC	LAB	Page #
2) Daylight Harvesting									
3) Astronomical/Clocks/Mechanical and Digital									
4) Low voltage controls									
5) Photo controls									
6) EMS systems (overview)									
7) Lighting contactors and Relays									
XI OVERCURRENT DEVICES									
XI-A. Function, operation and characteristics of overcurrent protection devices									
1) Purpose and location of devices									
2) Three considerations necessary for the electrical component									
3) Interrupting ratings									
4) Short circuit currents									
5) Overload and overcurrent situations									
6) Operation circuit breakers									
7) Function, operation and characteristics of ground fault circuit interrupters									
XII GROUNDING SYSTEMS									
XII-A. Function, operation and characteristics of grounding systems									
1) Reasons for grounding									
2) General types of faults									
XII LIGHTING SYSTEM MANAGEMENT									
a) Fundamentals of lighting system management									
1) Planned maintenance									

2) Group Relamping									
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3) Luminaire dirt lumen depreciation									
4) Lamp lumen depreciation									
5) Light level readings									
6) Fixture cleaning									
7) Basic lamp and Ballast trouble shooting									
XIII LIGHTING RETROFIT UPGRADES									
a) Fundamentals of lighting retrofits									
1) Purpose of lighting upgrades									
2) System surveys									
3) System payback analysis									
XIV EGRESS LIGHTING									
a) Fundamentals of exit signs and emergency lighting									
1) Exit signs									
2) Battery back-up luminaires									
3) Emergency lighting									
4) Emergency generator circuits									