

## **I. Electrical Safety**

- A. Shocking statistics
- B. Common causes of electrocution
- C. Common electrical injuries
- D. Human reaction to electrical current
- E. Personal protective equipment (PPE)
  - 1. Shock protection
  - 2. Arc flash arc blast protection
- F. Categories of meters
- G. Metering best practices(Hands-on metering)
- H. 5 ways of protecting against the hazards of electricity
  - 1. Insulation
  - 2. Isolation
  - 3. Circuit breakers
  - 4. Grounding and bonding
  - 5. GFCIs
    - a) Recommended practice for the use of class A GFCIs in the entertainment industry
    - b) Classes of GFCIs
- I. Codes and Regulations

## **II. Circuits**

- A. Electrical concepts
  - 1. Voltage (Hands-on metering)
  - 2. Current (Hands-on metering)
  - 3. Resistance (Hands-on metering)

## **III. Circuit laws**

- A. Ohm's law
- B. DC power formula (Hands-on metering)

## **IV. Power Distribution Systems**

- A. Feeder circuits and branch circuits
- B. Panels and racks (Hands-on panel building)

## **V. Cables and Connectors**

- A. Ampacities of cables
- B. Adjustment factors
  - 1. Ambient air temperature
  - 2. Current-carrying conductors in contact
  - 3. Harmonics
  - 4. Enclosed conductors
- C. Conductor markings (Visual inspection exercise)

## **VI. Voltage Drop**

- A. How voltage drop works ( $V = I \times R$ )
- B. Voltage drop demonstration
- C. Testing voltage drop factors (Hands-on measurement)

## **VII. Single-phase AC**

- A. Sine waves

- B. Power factor
- C. Single-phase AC power calculations (Hands-on)

### **VIII. 3-Phase Power**

- A. Phase angles
- B. Balancing loads
- C. 3-phase power calculations (Hands-on)

### **IX. Advanced Electrical Topics**

- A. Power factor
- B. Harmonics
  - 1. Neutral current
  - 2. Skin effect
  - 3. Voltage drop