

DIRECTIONS

Evaluate the student by checking the appropriate box to indicate the degree of competency. The rating for each competency should reflect **employability readiness** rather than the grades given in class.

Rating Scale:

0 No Exposure

1 Introduced – The student has been exposed through non-participation instruction (e. g., lecture, demonstration, field trip, video).

2 Practiced – The student can perform the task with direct supervision.

3 Entry-level Competency – The student can perform the task with limited supervision and/or does not perform the task to standard (a typical entry-level performance expectation)

4 Competency – The student consistently performs task to standard with no supervision (on at least two occasions or at instructor's option)

ELECTRICAL/ELECTRONICS OCCUPATIONS

ELECTRONICS OCCUPATIONS

A.BASIC TOOLS, INSTRUMENTATION, AND MATERIALS

- *A. 1 Practice proper industrial safety standards.
- *A. 2 Apply proper handling techniques of components.
- *A. 3 Demonstrate proper soldering techniques.
- *A. 4 Make common mechanical connections.
- *A. 5 Identify and use hand tools properly (see appendix).
- *A. 6 Identify and use power tools properly.
- *A. 7 Construct circuits using breadboard techniques.
- *A. 8 Set up and operate the following: analog and digital multimeters, oscilloscopes, power supplies, signal/function generators, and capacitance-inductance measurement devices.

□□□□□ **B.DC CIRCUITS**

- *B. 1 Solve basic algebraic problems as applicable to Electronics (Program Prerequisite).
- *B. 2 Relate electricity to nature of matter.
- *B. 3 Identify sources of electricity.
- *B. 4 Define voltage, current, resistance, and power.
- *B. 5 Apply and relate Ohm's Law.
- *B. 6 Read and interpret color codes to identify resistors.
- *B. 7 Measure properties of circuit using VOM and DMM meters.
- *B. 8 Analyze series circuits.
- *B. 9 Construct series circuits.
- *B. 10 Troubleshoot series circuits.
- *B. 11 Analyze parallel circuits.
- *B. 12 Construct parallel circuits.
- *B. 13 Troubleshoot parallel circuits.
- *B. 14 Analyze series-parallel circuits.
- *B. 15 Construct series-parallel circuits.
- *B. 16 Troubleshoot series-parallel circuits.
- B. 17 Analyze voltage dividers (loaded and unloaded).
- B. 18 Construct voltage dividers (loaded and unloaded).
- B. 19 Troubleshoot voltage dividers (loaded and unloaded).
- *B. 20 Determine physical and electrical characteristics of capacitors and inductors.
- *B. 21 Define magnetic properties of circuits and devices.

B. 22 Analyze and measure RL and RC time constants.

□□□□□ C.AC CIRCUITS

- *C. 1 Identify properties of an AC signal.
- *C. 2 Identify AC sources.
- *C. 3 Measure AC signals using oscilloscope and frequency meters.
- *C. 4 Describe AC capacitive circuits (Series and Parallel).
- *C. 5 Construct AC capacitive circuits (Series and Parallel).
- *C. 6 Troubleshoot AC capacitive circuits (Series and Parallel).
- *C. 7 Describe AC inductive circuits (Series and Parallel).
- *C. 8 Construct AC inductive circuits (Series and Parallel).
- *C. 9 Troubleshoot AC inductive circuits (Series and Parallel).
- *C. 10 Apply principles of transformers to AC circuits.
- *C. 11 Describe basic RC, RL, and RLC circuits (Series, Parallel , and Complex).
- *C. 12 Construct basic RC, RL, and RLC circuits (Series, Parallel, and Complex)
- *C. 13 Troubleshoot basic RC, RL, and RLC circuits (Series, Parallel and Complex).
- *C. 14 Describe resonant circuit concepts.
- *C. 15 Describe basic filter circuit concepts.

□□□□□ D.CHARACTERISTICS OF SOLID STATE DEVICES

- *D. 1 Identify properties of semiconductor materials.
- *D. 2 Identify, define, and measure characteristics of P-N junction diodes.

- D. 3 Describe characteristics of special diodes.
- *D. 4 Identify, define, and measure characteristics of bipolar transistors.
- D. 5 Identify, define, and measure FET characteristics.
- *D. 6 Describe concept of integrated circuits.

□□□□□ **E.ANALOG CIRCUITS**

- *E. 1 Describe single-stage amplifiers.
- *E. 2 Construct from schematic diagrams single-stage amplifiers.
- *E. 3 Troubleshoot single-stage amplifiers.
- *E. 4 Describe multi-stage amplifiers.
- *E. 5 Describe basic power supply circuits.
- *E. 6 Construct from schematic diagrams basic power supply circuits.
- *E. 7 Troubleshoot basic power supply circuits.
- E. 8 Describe operational amplifier circuits.
- E. 9 Construct from schematic diagrams operational amplifier circuits.
- E. 10 Troubleshoot operational amplifier circuits.
- *E. 11 Describe oscillator circuits.
- E. 12 Describe power supply regulators.

□□□□□ **F.DIGITAL CIRCUITS**

- *F. 1 Define and apply the binary number system.
- *F. 2 Analyze logic gates.
- *F. 3 Implement logic gates.
- *F. 4 Troubleshoot basic combination logic circuits.
- *F. 5 Describe flip-flops.
- *F. 6 Construct flip-flops.
- F. 7 Identify and define IC logic families.
- F. 8 Describe registers and counters.
- F. 9 Describe clock and timing circuits.
- F. 10 Describe logic arithmetic circuits.
- F. 11 Describe encoders and decoders.
- F. 12 Describe multiplexers and demultiplexers.
- F. 13 Describe memory devices.
- F. 14 Describe digital to analog and analog to digital conversions.
- F. 15 Describe digital displays.

□□□□□ **G. TECHNICAL RECORDS AND REPORTS**

- *G. 1 Draw and interpret electronics schematics.
- *G. 2 Record data and design curves and graphs.
- *G. 3 Make equipment failure reports.
- G. 4 Specify and requisition simple electronic components.
- G. 5 Write formal reports of laboratory experiences.
- G. 6 Compose technical letters.

□□□□□ **H. WORK PLACE SAFETY**

- *H. 1 Define and use safety terminology.
- *H. 2 Use proper safety equipment.
- *H. 3 Follow proper material control procedures, according to “Right to Know” regulations.
- *H. 4 Use tools and equipment safely.
- *H. 5 Practice good housekeeping in each work area.

Appendix A

List of Common Hand Tools:

soldering irons	steel rules
soldering guns	wire stripper
hex & spline wrench sets	chain nose pliers
cable cutter	curved nose pliers
offset screwdrivers	combination pliers
electric drill	round nose pliers
screw extractor	flat nose pliers
hammers	alignment screwdriver
round chassis punch	scissors
square chassis punch	C-clamps
metal punch	nut driver
electrician's knife	side cutting pliers
tube & parts extractors	vises
alignment tool	heat sink
wrenches	