Assessment **ET154 Computer Programming** **J Fiore**

Student Learning Outcomes (from Course Outline)

1. The student will demonstrate an understanding of programming a digital computer using a high level language.

2. The student will demonstrate problem analysis and solution techniques using the computer as a tool. These techniques will be applied and expanded upon in subsequent courses in the EET curriculum.

3. The student will demonstrate a basic knowledge of how to use a modern IDE (integrated development environment).

4. The student will demonstrate knowledge of the fundamentals of schematic capture.

5. The student will demonstrate knowledge of the fundamentals of computer circuit simulation.

6. Through the laboratory, the student will demonstrate practical insight and knowledge of computer systems.

Measurement:

For item 1, the student's grades on in-class tests and/or the final exam will be used with regards to programming problems. Problems will be taken from representative areas addressed in the course outline. A passing grade will be considered minimum acceptable performance.

For items 2, 3 and 6, the student will be given at least one programming assignment in the laboratory that will involve a programming problem related to the field of electricity/electronics (item 2). The student is expected to code a solution to the problem in a high level language. As part of the coding and testing process, the student must make use of the language IDE: Python IDLE (item 3). The student must test and run the program, save the source code, and print the results; submitting source code and problem output for grading (item 6).

Grade of A: Program meets or exceeds the assignment particulars. Proper coding techniques are obvious along with internal documentation. The results are neat and professional in appearance.

Grade of B: Program exhibits high functionality although there may be some minor output errors under specific conditions. Presentation, coding technique and documentation may suffer small aberrations from the ideal.

Grade of C: Program generally produces proper output although some of the more difficult or involved areas may not be correct. Coding style and documentation are average and could stand some sharpening.

Grade of D: Program exhibits problems in several output areas and documentation and/or coding techniques are vague or confusing.

Grade of F: Program exhibits any of the following deficiencies: majority of the program results are not correct under most conditions, coding style is substandard or obtuse, internal documentation missing.

For items 4 and 5, the student will be given a circuit schematic which will include placement of an instrument (DMM). In the computer lab the student is expected to use MultiSIM to capture the schematic and run a simulation (to obtain a voltage). The schematic must match the original, including all component values, proper placement and orientation of components, proper use of labels, and proper placement and editing of a title block. Some components will be virtual types (resistors and capacitors) while others may be obtained through the component database (transistor and diode).

Grade of A: Minor or no errors. Example errors include a single simple incorrect unit value (such as 220 k Ohms versus 220 Ohms), a missing label (such as Vin), and minor problems with the title block. These errors are largely cosmetic.

Grade of B: Schematic includes multiples of the types of errors noted above, although generally the wiring would be fine. Most errors are cosmetic and it would take only minor work, if any, to fix the circuit to produce a proper simulation.

Grade of C: Schematic includes minor wiring mistakes or numerous errors of the type noted above. The simulation may not work although it would require little alteration to make it proper.

Grade of D: Schematic exhibits wiring errors along with some component errors (value, type or placement) or an improper wiring for the simulated instrument. The errors are not merely cosmetic but functional, although the circuit is certainly recognizable.

Grade of F: Schematic exhibits major errors in wiring, component value and/or selection. Major re-work would be required to have a working simulation or presentable schematic diagram.