ELECTRONICS ENGINEERING TECHNOLOGY

2019 – 2020

PROGRAM SYLLABUS

PROGRAM INFORMATION

- **Number of High School Credits - 3.0 CTE/Occ. Ed./Elective**
  - **Equivalency credit: Algebra 2**
  - **Prerequisite: Algebra 1**
- **CTE Dual Credit – Edmonds Community College – Minimum grade of B required at SISC**
  - **SISC 1st Year Course Credit**
    - **ETEC 150 – Applied Technical Math – 5 Cr**
    - **ETEC 161 – DC Electronics – 5 Cr**
  - **SISC 2nd Year Course Credit**
    - **ETEC 162 – AC & Linear Electronics – 5 Cr**
    - **ETEC 163 – Digital & Microprocessor Electronics – 6 Cr**
- **Class Hours:**
  - **AM Session – 7:55 to 10:25 AM**
  - **PM Session – 11:10 AM to 1:40 PM**

INSTRUCTOR INFORMATION

- **Instructor: Ted Rodriquez, CET**
- **Office Hours: 10:25 to 11:10 AM**
- **Office Location: Bldg. 3, Room 359**
- **Phone: 425.348.2234**
- **Email: rodriqueztn@mukilteo.wednet.edu**
- **Best Way to Contact Me: Email works best in the EET department. I will reply as soon as practical.**

PROGRAM DESCRIPTION:

This program introduces the fundamental topics of Voltage, Current, Resistance and Power. This is accomplished through a combination of academic and hands-on experiences. Each assignment is typically one to two weeks long with a capstone soldering certification project administered during the 4th quarter.

First year students work on circuit configurations which illustrate the relationship between the four topics. Electrical equipment and tools which facilitate the learning process are covered as the student works at the lab bench.

Second year students are exposed to sensor technology, circuits and systems. These sensors are applied to analog, digital and industrial control applications. All necessary math is covered in the design and implementation of these applications.

The 2019-2020 school year in this department will see the addition of Mechatronics into the curriculum. The areas of Biometrics, environmental sensors, fiber optics and 3D printing are being added to the program. Solar, wind and hydro alternative energy-based content will continue as STEM related projects. We will also continue our work with the National Science Foundation (NSF) guitar building project this year. All the details implemented in building our guitars will meet the NSF project requirements and specifications. The guitar building project is totally student based and in compliance with the NSF Guitar Building Institute. If you have a desire to construct a professional quality musical instrument, consider building your own guitar or bass. Prices range from $139.00 for a three-pickup Fender Stratocaster model guitar to over $200.00 for a full kit which you assemble and customize from fretboard to headstock. Shipping and WA state sales tax will be added to the base price of your guitar. Some versions of these instruments may be subject to US tariff rules and regulations. These instruments will be yours to keep and enjoy. You can go online to Sinclair Community College NSF STEM guitar project site in Akron, Ohio at http://www.guitarbuilding.org, select Storefront, and then Products to see the different models and available options for your guitars. Make your selections during the summer so we can order the guitar kits during the second week of class in September. Delivery times from Sinclair CC vary from three to six weeks due to heavy demand.

COURSE EXPECTATIONS

- **As you progress in your course of study in the department, you will be involved in more and more direct application projects. You will be able to select an area of application. Robotics and control systems applications are one choice. Analog and digital audio applications are another. Computer controlled systems and programming is yet another. If you have a project or specific direction you have always wanted to pursue, you will have that opportunity.**
- **You are expected to turn in your assignments on time.**
- **Unless a mitigating issue requires your access to your cell phone during class, the use of cell phones is not permitted in the department when class is in session.**

LEARNING TARGETS/OBJECTIVES

Below is a partial list of the activities you will be able to perform upon completion of this program sequence with a grade of B (3.00 GPA) or better. You will be able to:

1. **Determine and identify unsafe safety practices and immediately apply corrective action.**
2. **Communicate safety concerns to your peers, class leaders and teacher.**
3. **Obtain your First Aid, CPR and AED certification.**
4. **Apply mathematic principles (Algebra) to AC and DC resistive circuit analysis.**
5. **Apply mathematic principles (Trigonometry) to AC reactive circuit analysis.**
6. **Use your Digital Multimeter (DMM), oscilloscope, function generator and power supply system in analyzing your electronic circuits.**
7. **Use Ohm's Law to analyze resistance, voltage and current in AC and DC circuits.**
8. **Identify the Color Code used in the field of electronics.**
9. **Determine the electrical value, power capacity, and tolerance of a resistor from its color code and physical size.**
10. **Locate and identify components and their function in a schematic diagram.**
11. **Prepare a circuit layout based on a schematic diagram of that circuit.**
12. **Identify solid state components by their electrical or electronic schematic symbol.**
13. **Apply mathematic equations to predict the performance of an audio amplifier.**
14. **Utilize your test instrumentation to verify proper circuit operation.**
15. **Use manufacturer's datasheets and information notices to obtain device specifications.**
16. **Build your guitars to meet or exceed the specifications set by the National Science Foundation.**
17. **Apply Mechatronics principles to analog and digital circuit design.**
18. **Use analog to digital (ADC) and digital to analog (DAC) conversion techniques in system computer interfacing.**
19. **Incorporate environmental, narrow and wide spectrum sensors in circuit applications.**
20. **Use electronics and mechatronics principles in designing motor control circuits.**
21. **Understand the concept of positive and negative feedback in automatic control systems.**
22. **Compare free-air laser and fiber optic light communication systems.**
23. **Use C or C-variant language for programming applications.**
24. **Investigate the types of Biometric sensors.**
25. **Apply STEM principles to your projects.**

Certification Opportunities

This course assesses student achievement of these specific outcomes and offers an opportunity for students to earn a certificate of achievement and a locally produced soldering proficiency certificate. A Precision Exam certification assessment is administered during the 4th quarter. Career skills certification is awarded upon successful attainment of proficiency in the area of Electronics Technology. A Precision Exam Pre-Test will be administered during the second week of 1st Quarter followed by the Post-Test during the end of 4th Quarter. The 21st Century Success Skills (soft skills) Exam will also be administered during the 4th quarter of the school year.

PROGRAM MATERIALS

- **COMPONENTS AND TEXTS**
    - **All electronic components and data specification sheets will be provided by the department.**
    - **Lessons in Electricity, Volumes: 1 through 6, Tony Kuphaldt, is available as an eBook at no charge to you. Your eBooks can be loaded into a 2GB flash drive from the main computer at the front of the classroom. If you wish to download your eBooks directly to your computer from the Internet, use the address shown here: http://www.ibiblio.org/kuphaldt/electricCircuits/.**
    - **There will be additional eBooks added to the computer located at the front of the classroom. I will make reference to these files occasionally and you may download them at your discretion.**
    - **If you experience difficulty when using a computer screen, there are textbooks in the department which are also available to you. You may check these out if you are more comfortable reading from a textbook than from a computer screen.**
- **LAB FEE**
    - **First and Second Year Students……$40.00**
    - **The lab fee in the EET department is used to cover the cost of your CPR and First Aid Certification. The cost of the solder certification capstone project will also be offset by your lab fee.**

ASSIGNMENTS AND GRADING

Grade Scale:

A	94-100%	A-	90-93%	B+	88-89%
B	83-87%	B-	80-82%	C+	78-79%
C	73-77%	C-	70-72%	D+	68-69%
D	63-67%	D-	60-62%	F	00-59%

ASSESSMENT

The grading in this program will be based on the following criteria:

1. **Laboratory exercises.....…….50%**
2. **Written and Lab examinations.....25%**
3. **Professional work ethics…….....25%**
   (attendance, punctuality, class participation, leadership traits, lab bench condition)

Grades will be calculated automatically by the Student Management System (SMS).

- **New assignments begin every two weeks preceded by a classroom discussion. They are due on Friday of the second week by the end of class.**
- **Make-up or late work is accepted if prior arrangements have been discussed.**
- **Grades are posted on the SMS on Mondays. You and your parents can view your grades and progress by accessing the online SMS system.**

"Sno-Isle TECH Skills Center is administered by Mukilteo School District and follows MSD School Board Policies and Procedures."