

DEPARTMENT: TECHNOLOGY EDUCATION	COURSE TITLE: ELECTRONICS III COURSE NUMBER: 510A
GRADE(S): 10 – 12	PRE-REQUISITES (IF ANY): ELECTRONICS I; ELECTRONICS II (A)

UNIT	LENGTH	CONTENT	SKILLS	METHODS OF ASSESSMENT	FRAMEWORK STRAND(S) & STANDARD(S)
Light and Fiber Optics	3 weeks	<ul style="list-style-type: none"> • Light sources and detectors • Reflection and refraction of light; total internal reflection and critical angle • Light detectors, (pulse) transmitters and receivers • Fiber optic cable characteristics, splicing and termination 	<p>Students will:</p> <ul style="list-style-type: none"> • Problem solve involving principles (utilizing algebra) of geometric optics • Interpret schematic diagrams • Construct and test electronic circuits • Predict and measure light paths involving multiple reflecting surfaces 	<ul style="list-style-type: none"> • Problem sets (both diagrammatic and numerical) involving the reflection and reflection of light • Lab work with optical systems and electronic circuits • Unit test 	STE-S-4, 9/10-6.1 – 6.5
Surface Mount Devices	1 week	<ul style="list-style-type: none"> • Identification, mounting, soldering and testing of SMD's on PC board 	<p>Students will:</p> <ul style="list-style-type: none"> • Develop electronic circuit board fabrication skills (advanced level) working with miniature tools and lamp/magnifying system 	<ul style="list-style-type: none"> • Successful construction of a SMD kit • Written test on component identification and fabrication processes related to SMD fabrication 	STE-S-4, 9/10-1.5, 5.2
Photovoltaic Devices	2 weeks	<ul style="list-style-type: none"> • Photovoltaic cell operation and applications • Connecting PV cells in series and parallel for real-world applications • Calculating cell efficiency based on physical measurements • Circuit construction and testing using DMM's and oscilloscope 	<p>Students will:</p> <ul style="list-style-type: none"> • Read and interpret schematic diagrams • Use test instruments (DMM and oscilloscope) to make measurements of circuit parameters • Use basic research skills to gather information on PV cell technology 	<ul style="list-style-type: none"> • Problem sets involving numerical, diagrammatic and research (print and electronic) techniques • Lab activities with associated problem solving; unit (written) test 	STE-S-4, 9/10-1.5, 5.2, 5.5
Communications Systems	2 weeks	<ul style="list-style-type: none"> • Telephone (hard-wired) and radio communications systems • Input and output devices • Processing/control circuitry; transmitters and receivers <p>Signal transmission and propagation</p>	<p>Students will:</p> <ul style="list-style-type: none"> • Read and interpret schematic diagrams and circuit assembly instructions • Assemble telephone and radio kits • Use test equipment to adjust circuits and troubleshoot 	<ul style="list-style-type: none"> • Assembly/construction of appropriate kits with troubleshooting as needed • Written unit test. 	STE-S-4, 9/10-1.5, 5.1

Student Project	4 weeks	<ul style="list-style-type: none"> • Student designed project integrating and/or developing ideas from Electronics I, Electronics II (A) and (B) 	<p>Students will:</p> <ul style="list-style-type: none"> • Develop a technological idea through to the design and building of a prototype model • Research (print/non-print) related to the technology idea • Organize a presentation including -- at a minimum -- an oral and written component 	<ul style="list-style-type: none"> • Journal documenting the work from initial ideas through to the completion of the prototype • Oral presentation to the class (with additional AV support as desired) and written paper 	STE-S-4, 9/10-1.1
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