COURSE OUTLINE: ELN224 - DIGITAL ELECT/AVIONI

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Course Code: Title	ELN224: DIGITAL ELECTRONICS AND AVIONICS
Program Number: Name	4061: AVIATION TECHNOLOGY
Department:	ELECT./INSTRUMENTATION PS
Semesters/Terms:	20F
Course Description:	The student will be able to explain the operation and use of modern digital devices and circuits, including common Digital Integrated circuits as well as other pulse shaping/generating circuits, with emphasis on analysis and troubleshooting. The student will be able to solve problems relating to Digital Numbering Systems and Boolean algebra. Students will also be able to explain the application of these circuits to flight instruments and electronic circuits which produce, transmit and condition analog and digital signals.
Total Credits:	3
Hours/Week:	3
Total Hours:	45
Prerequisites:	ELR104
Corequisites:	There are no co-requisites for this course.
Essential Employability Skills (EES) addressed in this course:	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems.
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Other Course Evaluation & Assessment Requirements:	Students must achieve a passing grade on the Tests portion (i.e. 40/80) in order to pass the course.
Books and Required Resources:	Aircraft Electricity and Electronics by Thomas K. Eismin Publisher: McGraw-Hill Education Edition: 6 ISBN: 978-0-07-179915-7

Course Outcomes and Learning Objectives:	**Course Outcome 1**	**Learning Objectives for Course Outcome 1**
	1. Explain the characteristics and operation of basic PN semiconductor devices (Diode, Zener, LED, LCD and Light Detecting Diodes)	1.1 Describe the operation of the PN devices listed 1.2 Correctly identify, draw and label the schematic symbols of these devices 1.3 Describe and give typical values of basic electrical characteristics of these devices

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2020-2021 academic year.

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Course Outcome 2	Learning Objectives for Course Outcome 2
2. Explain the application of basic PN semiconductor devices (Diode, Zener, LED, LCD and Light Detecting Diodes)	2.1 Explain the operation of various rectifiers. 2.2 Explain the operation of Zener voltage regulators 2.3 Calculate quantities associated with rectification and voltage regulation.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Explain the characteristics and operation of Bipolar Junction Transistors (BJTs).	3.1 Describe the operation of PNP and NPN Transistors. 3.2 Describe basic electrical characteristics of Transistors
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Describe the application of Transistors in Switching and Amplifier Circuits.	4.1 Explain the operation of a basic transistor switch circuit. 4.2 Calculate quantities associated with the operation of a transistor switch. 4.3 Explain the operation of BJT Amplifier circuits 4.4 Calculate voltages, currents and gain for BJT amplifiers with various Biasing Methods.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Explain the operation of digital logic circuits and numbering systems.	5.1 Explain the difference between Analog and Digital 5.2 Describe various Digital Numbering Systems, and perform conversions between Decimal, Binary, Octal, Hexadecimal and ASCII. 5.3 Explain the operation of basic digital logic functions using standard symbols, Algebraically (Boolean), with a Truth Table and Descriptively. 5.4 Analyze circuits involving combinations of digital logic functions.
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. Describe the operation of basic RF Communication Circuits and Systems	6.1 Describe the Radio Frequency Spectrum as prescribed by D.O.C. and F.C.C. 6.2 Explain the theory and concepts of Radio Frequency communication (Transmission/Reception) 6.3 Explain basic RF modulation techniques (AM/FM) 6.4 Explain the principles of Antennas and RF Wave propagation. 6.5 Describe the major components of an aircraft communication system. 6.6 Perform calculations relating to wavelength, frequency and antenna length.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments/Quizzes	20%
Tests	80%

Date: September 2, 2020

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| **Addendum:** | Please refer to the course outline addendum on the Learning Management System for further information. |

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