FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER:	EET 1070
COURSE TITLE:	Electronics Theory
PREREQUISITE(S):	None
COREQUISITE(S):	None
CREDIT HOURS:	1
CONTACT HOURS/WEEK:	1
CONTACT HOUR BREAKDOWN:	
Lecture/Discussion:	1
Laboratory:	
Other _____:	
FACULTY WORKLOAD POINTS:	1.0
STANDARDIZED CLASS SIZE ALLOCATION:	24

CATALOG COURSE DESCRIPTION:

This is a high level introductory course in basic electricity intended for exploring the engineering technology programs. It consists of the concepts, laws and definitions encountered in DC and AC electric circuits. Laboratory exercises are required.

SUGGESTED TEXT(S):	Electric Circuits Fundamentals, 2nd ed., Thomas L. Floyd, Charles E. Merrill Publishing Co.
IMPLEMENTATION DATE:	Spring Term 2007 (20072)
REVIEW OR MODIFICATION DATE:	

COURSE TOPICS	CONTACT HOURS PER TOPIC
I. Introduction	1
A. Quantities, Measurements, and Units	
B. Accuracy, Rounding, and Significant Digits	
C. Powers of ten and Scientific Notation	
D. Conversion between Systems of Units	
E. Engineering Prefixes	
II. Current and Voltage	1
A. Atomic Structure	
B. Crystals	
C. Current	
D. Coulomb Force Law	
E. Potential Difference and Voltage	
III. Conductors, Insulators, and Resistors	1
A. Conductors	
B. Insulators	
C. Conduction in Non-Metallic Mediums	
D. The Nature of Resistance	
E. Ohm's Law and Resistance	
F. Resistivity	
G. Temperature and Resistance	
IV. Power	1
A. Energy	
B. Work	
C. Power	
D. Conversion of Units	
E. Efficiency	
V. Circuits and Circuit Laws	3
A. Series Connections	
B. Resistors in Series	
C. Voltage Rises and Drops	
D. Kirchhoff's Voltage Law	
E. Characteristics of Series Circuits	
F. Voltage Dividers	
G. Power in Series Circuits	
H. Parallel Connections	

COURSE TOPICS	CONTACT HOURS PER TOPIC
I. Resistors in Parallel	
J. Kirchhoff's Current Law	
K. Current Dividers	
L. Conductance	
M. Characteristics of Parallel Circuits	
N. Power in Parallel Circuits	
O. Series - Parallel Circuits	
P. Equivalent Circuits	
Q. Ideal Voltage Sources	
R. Ideal Current Sources	
S. Voltmeter Loading Effect	
VI. Capacitance	1
A. Charges and Electric Fields	
B. Capacitors and Capacitance	
C. Dielectrics and the Dielectric Constant	
D. Capacitors in Series	
E. Capacitors in Parallel	
F. Capacitive Time Constants	
G. Universal Time Constant Chart	
H. Capacitive Energy	
VII. Magnetism	1
A. Electricity and Magnetism	
B. Magnetic Fields	
C. Magnetomotive Force	
D. Reluctance and Permeability	
E. Flux Density and Magnetic Field Intensity	
F. Magnetic Materials	
G. Hysteresis	
H. Eddy Current	
I. Magnetic Shielding	
VIII. Inductance	1
A. Electromagnetic Induction	
B. Faraday's Law	
C. Lenz's Law	
D. Inductors and Inductance	
E. Inductors in Series	
F. Inductors in Parallel	
G. Inductive Time Constants	
H. Solutions for Instantaneous Currents	

COURSE TOPICS	CONTACT HOURS PER TOPIC
I. Inductive Energy	
IX. Alternating Current and Reactance	1
A. Basic Generator Construction and Operation	
B. The Sinusoidal Voltage Wave	
C. Average and RMS Values	
D. Reactance	
E. Phase Differences	
X. Phasors and Impedance	1
A. Phasors and Vectors	
B. Phasor Diagrams and Graphical Solutions	
C. Resistance and Reactance in Series	
D. Resistance and Reactance in Parallel	
E. Conductance, Susceptance & Admittance	
XI. AC Power	1
A. Resistance Power	
B. Reactive Power	
C. Apparent Power	
XII. Transformers	1
A. Construction and Operation	
B. Turns Ratio	
C. Reflected Impedance	
D. Leakage and Power Losses	
E. Efficiency	
F. Types of Transformers	
XIII. Reviews and Examinations	1

DC/AC Laboratory Exercises

1. Current and Voltage Measurements with Analog Meters.
2. Resistors and Resistance Measurements with Analog Meters.
3. Ohm's Law
4. Series Circuits and Kirchhoff's V. Law
5. Parallel Circuits and Kirchhoff's C. Law
6. Troubleshooting
7. Capacitance
8. Electromagnetism
9. Measurements with Oscilloscopes
10. Phase Angle and Reactance

PROGRAM TITLE: Biomedical Engineering Technology

COURSE TITLE: Electronics Theory

CIP NUMBER: 1615.040101

LIST PERFORMANCE STANDARDS ADDRESSED:

NUMBER(S): TITLES(S):

07.0 UNDERSTAND BASIC ELECTRONICS/COMPUTER PRINCIPLES – The student will be able to:

07.01 Understand basic electrical signals.
07.04 Understand basic digital analysis.
07.06 Understand electrical diagrams.
07.07 Understand microprocessors and microcontrollers.
07.12 Demonstrate proficiency in reading electrical diagrams.
07.13 Demonstrate proficiency in analyzing basic electrical systems.
07.14 Demonstrate proficiency in troubleshooting basic electrical systems.
07.16 Demonstrate proficiency in electrical measurements.

Florida State College At Jacksonville

Course Learning Outcomes & Assessment For All College Credit Courses

NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.

Section 1

COURSE PREFIX AND NUMBER: **EET1070**

SEMESTER CREDIT HOURS: **1**

COURSE TITLE: **Electronics Theory**

Section 2

TYPE OF COURSE: (Click on the box to check all that apply)

- ☐ **AA Elective**
- ☐ **AS Required Professional Course**
- ☐ **College Prep**
- ☐ **AS Professional Elective**
- ☒ **AAS Required Professional Course**
- ☐ **Technical Certificate**
- ☐ **Other** _____
- ☐ **General Education: (For General Education courses, you must also complete Section 3 and Section 7)**

Section 3 (If applicable)

INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:

- ☐ **Communications**
- ☐ **Social & Behavioral Sciences**
- ☐ **Mathematics**
- ☐ **Natural Sciences**
- ☐ **Humanities**

Section 4

INTELLECTUAL COMPETENCIES:

- ☒ **Reading**
- ☐ **Speaking**
- ☒ **Critical Analysis**
- ☐ **Quantitative Skills**
- ☐ **Scientific Method of Inquiry**
- ☒ **Writing**
- ☒ **Listening**
- ☐ **Information Literacy**
- ☐ **Ethical Judgment**
- ☒ **Working Collaboratively**

Section 5

	LEARNING OUTCOMES	METHOD OF ASSESSMENT
• 1	A student will be able to measure current and voltage with an analog or digital meter.	Hands-on exercises, written quizzes and tests.
• 2	A student will be able to measure a resistor and make resistance measurements with analog and digital meters.	Hands-on exercises, written quizzes and tests.
• 3	A student will be able to properly apply Ohm's Law to calculate voltage, resistance, and current	Hands-on exercises, written quizzes and tests.
• 4	A student will be able to apply Kirchhoff's to series circuits.	Hands-on exercises, written quizzes and tests.
• 5	A student will be able to troubleshoot basic circuits.	Hands-on exercises, written quizzes and tests.
• 6	A student will be able to measure capacitance with an analog and digital meter.	Hands-on exercises, written quizzes and tests.
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Section 6 Name of Person Completing This Form: Ernie Friend Date: 12/5/06