RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

ELEC 102 – Electrical Fundamentals II

I. Basic Course Information

A. Course Number and Title: ELEC 102 – Electrical Fundamentals II

B. New or Modified Course: New Course

C. Date of Proposal: Semester: Spring Year: 2018

D. Effective Term: Fall 2018

E. Sponsoring Department: Science and Engineering

F. Semester Credit Hours: 3

G. Weekly Contact Hours: Lecture: 3
Laboratory: 0
Out of class student work per week: 6

H. Prerequisites: ELEC 101 Electrical Fundamentals

I. Laboratory Fees: No

J. Name and Telephone Number or E-Mail Address of Department Chair and Divisional Dean at time of approval: Marianne Baricevic, Marianne.baricevic@raritanval.edu (Department Chair); Sarah Imbriglio, sarah.imbriglio@raritanval.edu (Dean of STEM)

II. Catalog Description

Prerequisite: ELEC 101 Electrical Fundamentals

This course will enable students to solve combination circuits, determine wire sizes, calculate voltage drops, and describe the Ionization Process and the Pythagorean Theory. Inductance, reactance, and impedance will be covered, as well as the advantages of alternating current and the use of capacitors in a series and in parallel circuits.

III. Statement of Course Need

A. This course is designed to introduce students to topics related to advanced circuitry in the areas of complex and three-phase circuits with various calculations in the ionization process. Understanding of these concepts and analysis techniques is necessary for subsequent coursework in the Electric Utility Technology AAS degree.

B. The course has no lab component.

C. This course meets a program requirement for the Electric Utility Technology AAS degree.

IV. Place of Course in College Curriculum

A. Free Elective (This applies automatically to all college level credit courses in the College.)
B. This course meets a program requirement for the Electric Utility Technology AAS degree.
C. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, www.njtransfer.org; b) for all other colleges and universities, go to the individual websites.

V. Outline of Course Content

A. Series and Parallel Combination Circuits
B. Determining Conductor Sizes
C. Conduction in Liquids and Gases
D. The Ionization Process and Pythagorean Theory
E. Other Sources of Electricity
F. Vectors and Basic Trigonometry
G. AC Waveforms and Semi Wave Values
H. Inductances and Inductive Reactance in AC Circuits
I. Resistive – Inductive in Series and Parallel Circuits
J. Capacitors
K. Application and Testing of Capacitors
L. Capacitance in AC Circuits
M. Resistive – Capacitive in Series and Parallel Circuits
N. Various Types of Filters in a Circuit
O. Three Phases of Circuits

VI. General Education and Course Learning Outcomes

A. General Education Learning Outcomes:

State the **General Education Learning Outcomes** for the academic course.

At the completion of the course, students will be able to:

1. Demonstrate an understanding of inductance and capacitance in a circuit. (GE NJ 3, 4)
2. Apply basic laboratory techniques relevant to basic trigonometry and vectors. (GE NJ 2, 3)
3. Perform various calculations related to combination circuits. (GE NJ 2)

B. Course Learning Outcomes:

At the completion of the course, students will be able to:

1. Describe the performance of an AC sine wave and semi wave values.
2. Identify transformer connections in a three-phase circuit.

C. Assessment Instruments

Given the outcomes described above, LIST which of the following assessment methods may be used; please note any instruments that will be ***required*** to assess outcomes as listed above (e.g., research papers for information literacy):

1. notebook
2. homework assignments
3. research papers
4. exams
5. class participation
6. discussion and presentations
7. computer programs

VII. Grade Determinants

What factors may enter into the determination of the final? LIST the grade determinants. Please note any grade determinants that will be *required* for the course. For example:

A. homework assignments
B. projects
C. exams
D. presentations and discussions

Given the goals and outcomes described above, LIST the primary formats, modes, and methods for teaching and learning that may be used in the course:

A. lecture/discussion

B. small-group work
C. computer-assisted instruction
D. documentaries/videos
E. student oral presentations
F. student collaboration
G. independent study

VIII. Texts and Materials

LIST which of the following types of course materials will be used. Specify title and publication information about textbooks and any other major text sources or other materials.

A. Delmar Standard Textbook of Electricity, 6th Edition, by Stephan L. Herman
B. film and video
C. other web and computer-based sources

(Please Note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.)

IX. Resources

A. Libraries
B. Computer with online access for reearch

X. Honors Options [if relevant]: no honors option