STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

ELEC 386 – Electronic Communications (II)

Prepared By: Stephen E. Frempong

SCHOOL OF ENGINEERING TECHNOLOGY
ELECTRICAL ENGINEERING TECHNOLOGY & ENGINEERING
SCIENCE DEPARTMENT
FALL 2018

A. TITLE : Electronic Communications (II)

B. COURSE NUMBER: ELEC 386

C. CREDIT HOURS: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

Credit Hours: 3 !
Lecture Hours: 2 per week !
Lab Hours: 2 per week !
Other: per week

Course Length: 15 Weeks

D. WRITING INTENSIVE COURSE: NO

E. GER CATEGORY: NONE

F. SEMESTER OFFERED: SPRING or FALL

G. COURSE DESCRIPTION: This course is the continuation of Electronic Communications (I), and is designed to prepare students for modern telecommunications industry. Topics include: Transmission Lines, Wireless digital communications, Optical communications, Cell phone communications, CDMA, OAS, Wireless technologies, Microwave and lasers, Antennas, and Waveguide and Radar

H. PRE-REQUISITES: ELEC 385 [Electronic Communications I] and MATH 162 (Calculus II) or permission of instructor.

CO-REQUISITES: NONE

I. STUDENT LEARNING OUTCOMES

Institutional Students Learning Outcomes (ISLO)

Communication (2) Critical Thinking (3) Foundational Skills (4) Social Responsibility (5) Industry, Professional, Discipline-Specific Knowledge and Skills.

ABET-STUDENT OUTCOMES (a-k)

Course Objectives	Institutional SLO's	ABET Student Outcomes
Define characteristic impedance and calculate the characteristic impedance of a	2. Critical Thinking	(b) An ability to select and apply a knowledge of mathematics, science,

transmission line by using several different methods.	5. Industry, Professional, Discipline-Specific Knowledge and Skills.	engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.
Define standing wave ratio (SWR), explain its significance for transmission line design, and calculate SWR by using impedance values or the reflection coefficient.	2. Critical Thinking	(b) An ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.
Describe the characteristics of ground waves, sky waves, and space wave propagation, and compute the length of one-quarter wavelength, and half wavelength antennas, given frequency of operation.	2. Critical Thinking 5. Industry, Professional, Discipline-Specific Knowledge and Skills.	(b) An ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.
Define the terms posigrade, restrograde, geocenter, apogee, perigee, ascending, descending, period, angle of inclination, geosynchronous, latitude, longitude, meridian, and perform calculations.	2. Critical Thinking 5. Industry, Professional, Discipline-Specific Knowledge and Skills.	(j) a knowledge of the impact of engineering technology solutions in a societal and global context.

J. APPLIED LEARNING COMPONENT: CLASSROOM/LAB

K. TEXTS:

Louis E. Frenzel, Principles of Electronic Communications Systems, 4th Edition. 2016
Publisher: McGraw-Hill Education, 2 Penn Plaza, New York, NY 10121.
ISBN: 9780073373850

L. REFERENCES:
Roy Blake, Electronic Communication Systems, 2th Edition, 3 Columbia Circle, NY 12212: Delmar Thomson Learning, 2002.

M. EQUIPMENT: Electronics laboratory is equipped to support this course.

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS: Tests, Midterm Exam, Assignments, Laboratory projects, and Final Exam.

P. DETAILED COURSE OUTLINE:

1. ! Antennas
    a. ! Basic Antenna Theory
    b. ! Hertz Antenna
    c. ! Radiation Resistance
    d. ! Antenna Feed Lines
    f. Marconi Antenna
    g. ! Antenna Arrays
    h. ! Special Purpose Antennas
2. ! Waveguides and Radar
    a. ! Comparison of Transmission Systems
    b. ! Types of Waveguides
    c. ! Termination and Attenuation
    d. ! Directional Coupler
    e. ! Micro-integrated Circuit Waveguiding
3. ! Microwaves and Lasers
    a. ! Microwave Antennas
    b. ! Microwave Tubes
    c. ! Solid-State Microwave Devices
    d. ! Low-Noise Amplification
4. ! Transmission Lines/Optics
    a. ! Transmission Line Basics
    b. ! Standing Waves
    c. ! Circuit Elements
    d. ! Fiber Attenuation and Dispersion
    e. ! Light Sources
    f. ! Detectors
    g. ! Fiber Connectors
    h. ! Systems
    i. ! Fiber-Optic LANs
5. ! Wireless Technologies
    a. Cellular Telephone Systems
    b. ! Digital Cell Phones Systems

i. ! Wireless LANs and Personal Area Networks (PAN)
j. ! PANs and Bluetooth
k. ! Infrared Wireless
l. ! Radio Frequency Identification
m. Ultrawideband Wireless

6. ! Communication Tests and Measurements
   a. ! Communications Test Equipment
   b. ! Troubleshooting Techniques
   c. ! Electromagnetic Interference
7. ! Satellite Communications

   Define the terms posigrade, restrograde, geocenter, apogee, perigee, ascending, descending, period, angle of inclination, geosynchronous, latitude, longitude, meridian, and perform calculations.

Q. LABORATORY OUTLINE:

1. ! Lab-Volt Analog Communications Trainer
2. ! Communication Transmitter Design Project