

ELEI 215

COMMUNICATIONS ELECTRONICS

3 Semester Hours

The Community College of Baltimore County

Description

Communications Electronics

Discusses basic principles of communications and communications circuits including transmission line principles, antennas, and electro-magnetic propagation; explores the interrelationship between digital systems and communications systems. Lecture two hours lab one hour per week one semester.

Prerequisite: ELEI-107 or ELET 111 or consent of program director.

Overall Course Objectives.

Upon completion of this course the student will be able to:

Understand basic electronic communications principles and the most common communications circuits. Gain hands-on experience with the most commonly encountered pieces of communications equipment. Understand how communications electronics and digital electronics are interrelated.

Major Topics

Amplitude Modulation fundamentals, A.M. analysis, percentage of modulation, circuits for A.M. generation, A.M. Transmitter systems. A.M. Reception, receiver characteristics, A.M. Detection, superheterodyne receivers, superheterodyne tuning, superheterodyne circuits, automatic gain control. Single-sideband communications, single side-band characteristics, side-band generation. Frequency modulation transmission, F.M. analysis, angle modulation, direct F.M. generation, indirect F.M. generation. F.M. Reception, receiver circuits, R.F. amplifiers, limiters, discriminators, phase-locked loops. Television, transmitter principles, transmitter/receiver synchronization, the television signal, television receivers. Communications techniques, frequency conversion, special techniques, frequency synthesis, facsimile, communications transceivers, cellular telephones. Digital communications, telephony, pulse-code modulation, telemetry, coding, code transmission, modems, data communications networks, local area networks. Transmission lines, types, electrical characteristics, voltage propagation, non resonant lines, resonant lines, standing waves. Antennas and wave propagation, electromagnetic waves, ground; space; and space wave propagation. Basic antenna theory, Hertz and Marconi antennas, antenna arrays.

Course Requirements

The instructor will administer Exams (60%), Laboratory assignments (30%), Homework assignments (10%).

Other Course Information

Additional information about this or any other Industrial electricity/electronics course may be obtained by contacting the IEE/Telecommunications Program Director.