



# BROWARD COMMUNITY COLLEGE COURSE OUTLINE

**LAST REVIEW:** 2004-2005      **NEXT REVIEW:** 2009-2010      **STATUS:** A

**COURSE TITLE:** Avionics Communications Systems

**COMMON COURSE NUMBER:** AVS 0092C

**CREDIT HOURS:** 3.75

**CONTACT HOUR BREAKDOWN**

*(per 16 week term)*

**CLOCK HOURS:** 180  
*(Voc. Course ONLY)*

Lecture: 180      Lab:

Clinic:              Other:

**PREREQUISITE(S):** Airframe & Powerplant training, Electronics training, previous experience

**COREQUISITE(S):**

**PRE/COREQUISITE(S):**

**COURSE DESCRIPTION:** *(750 characters, maximum)*

The purpose of this program is to prepare students for employment radio mechanics (85514608) and as avionics technicians (823.281-010). The course content includes, but is not limited to, troubleshooting, repair and installation of airborne radio communications, radio navigation and radar equipment systems in accordance with regulatory and industry standards. Also included is instruction in basics of AM and FM transmitters and receivers and avionics equipment. Skills preparation for passing licensing/certification tests required by industry forms an integral part of the curriculum.

**UNIT TITLES**

1. AM and FM Transmitters
2. AM and FM Receivers
3. AM and FM Transceivers
4. Electromagnetic Wave Emissions



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## UNITS

### Unit 1 AM and FM Transmitters

#### General Outcome:

#### 1.0 The student shall:

#### Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 1.1 Define DSB, SSB and FM modulation.
- 1.2 Draw, analyze and troubleshoot AM and FM RF oscillator circuits.
- 1.3 Draw, analyze and troubleshoot buffer and multiplier circuits.
- 1.4 Draw, analyze and troubleshoot RF power amplifier circuits.
- 1.5 Draw, analyze and troubleshoot AM and FM modulation circuits.
- 1.6 Draw, analyze and troubleshoot microphone circuits.
- 1.7 Draw, analyze and troubleshoot balanced modulators and SSB filter circuits.
- 1.8 Draw, analyze and troubleshoot AM and FM power supply circuits.
- 1.9 Make power, frequency and modulation measurements of AM and FM transmitters.
- 1.10 Align and troubleshoot AM and FM transmitters.
- 1.11 Describe FCC rules pertaining to AM and FM transmitter maintenance and operation.



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## **Unit 2 AM and FM Receivers**

### **General Outcome:**

#### **2.0 The student shall:**

### **Specific Measurable Learning Outcomes:**

#### **Upon successful completion of this unit, the student shall be able to:**

- 2.1 Draw, analyze and troubleshoot receiver audio voltage and power amplifiers and speaker/headphone circuits.
- 2.2 Draw, analyze and troubleshoot AM and FM detector circuits.
- 2.3 Draw, analyze and troubleshoot AM IF amplifier circuits.
- 2.4 Draw, analyze and troubleshoot FM IF amplifier and limited circuits.
- 2.5 Draw, analyze and troubleshoot receiver oscillator and AFC circuits.
- 2.6 Draw, analyze and troubleshoot RF mixer/hetrodyne circuits.
- 2.7 Draw, analyze and troubleshoot receiver RF amplifier circuits.
- 2.8 Draw, analyze and troubleshoot AVC/AGC circuits.
- 2.9 Draw, analyze and troubleshoot receiver power supplies.
- 2.10 Make receiver sensitivity, selectivity, bandwidth, image rejection and adjacent channel rejection measurements.
- 2.11 Align and troubleshoot AM and FM receivers.



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**Unit 3 AM and FM Transceivers**

**General Outcome:**

**3.0 The student shall:**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 3.1** Analyze and troubleshoot transceiver control, metering and switching circuits.
- 3.2** Analyze and troubleshoot transceiver frequency synthesizers and phase locked loop circuits.
- 3.3** Analyze and troubleshoot squelch circuits.
- 3.4** Align and troubleshoot transceivers.



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**Unit 4 Electromagnetic Wave Emissions**

**General Outcome:**

**4.0 The student shall:**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 4.1 Define the radio frequency spectrum.
- 4.2 Define types and classification of RF emissions.
- 4.3 Define the characteristics of radio waves.
- 4.4 Define radio wave propagation method.
- 4.5 Define the basic types of antennas.
- 4.6 Draw the voltage and current relationships and radiation patterns for the basic types of antennas.
- 4.7 Solve signal strength problems and measure signal strength.
- 4.8 Solve problems pertaining to antenna length, propagation velocity and frequency.
- 4.9 Define methods for antenna tuning, gain and directivity.
- 4.10 Define transmission lines in terms of electrical and physical properties.
- 4.11 Define standing waves, cause and effect, and measure standing wave ratios.
- 4.12 Define tuned transmission lines and describe applications.
- 4.13 Draw voltage, current and impedance relationships for tuned transmission lines.
- 4.14 Compute transmission line losses.
- 4.15 Construct transmission lines.
- 4.16 Define waveguides, resonant cavities and their applications.