

**COURSE ELT2100: RADIO COMMUNICATION****Level:** Intermediate**Theme:** Communication Systems**Prerequisite:** ELT2090 Analog Communication 2**Description:** Students demonstrate the fundamental concepts of electromagnetic communication systems.**Parameters:** Frequency generator, counter, digital multimeter, hand tools and related resources.**Curriculum and Assessment Standards**

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>• describe the principles of electromagnetic communication systems</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• drawing block diagrams to explain the following communication systems:               <ul style="list-style-type: none"> <li>– AM, FM radio</li> <li>– TV</li> <li>– short-wave radio</li> <li>– satellite communication</li> <li>– cellular telephone</li> <li>– cable television</li> <li>– two-way radio</li> </ul> </li> <li>• explaining electromagnetic communication terms, such as:               <ul style="list-style-type: none"> <li>– carrier modulation/demodulation</li> <li>– amplitude modulation</li> <li>– frequency modulation</li> <li>– frequency spectrum</li> <li>– stereo</li> <li>– decoder</li> <li>– sidebands</li> <li>– oscillators.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>ELT2100–1: Presentations/Reports:</i>  <i>Electromagnetic Communication Systems</i></p> <p><i>Standard</i>  <i>Performance rating of 2 for each applicable task</i></p>	<p>20</p>



**COURSE ELT2100: RADIO COMMUNICATION (continued)**

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>• demonstrate established laboratory procedures and safe work practices</li> <li>• demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• demonstrating an understanding of the following circuits through experimentation and/or computer simulation:               <ul style="list-style-type: none"> <li>– Hartley oscillator</li> <li>– Colpitts oscillator</li> <li>– audio amplifier</li> <li>– tuned collector oscillator.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>ELTLAB–2: Assessment Checklist: Laboratory Practice, Parts 1, 2 and 3</i></p> <p><i>Standard</i>  <i>Performance rating of 2 for each applicable task</i></p> <ul style="list-style-type: none"> <li>• observed performance in following:               <ul style="list-style-type: none"> <li>– established laboratory procedures</li> <li>– avoidance of radiation hazards</li> <li>– avoidance of radio frequency burns.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>ELTPSP: Assessment Checklist: Laboratory Procedures and Safety Practices</i></p> <p><i>Standard</i>  <i>Performance rating of 2 for each applicable task</i></p> <ul style="list-style-type: none"> <li>• observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>5</p> <p>Integrated throughout</p>

Concept	Specific Outcomes	Notes
<p>Safety/Resource Management</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• demonstrate appropriate safety techniques with respect to:               <ul style="list-style-type: none"> <li>– radiation hazards</li> <li>– radio frequency burns.</li> </ul> </li> </ul>	

**COURSE ELT2100: RADIO COMMUNICATION (continued)**

Concept	Specific Outcomes	Notes
Fundamentals	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• research the benefits and drawbacks of a wireless communication</li> <li>• research the rules that govern Radio Frequency (RF) communication</li> <li>• explain electromagnetic communication terms leading towards such topics as:               <ul style="list-style-type: none"> <li>– carrier modulation/demodulation</li> <li>– amplitude modulation (AM)</li> <li>– frequency modulation (FM)</li> <li>– frequency spectrum.</li> </ul> </li> </ul>	Department of Communication, Industry Canada pamphlets.
System Identification	<ul style="list-style-type: none"> <li>• identify different communication systems that employ electromagnetic communication:               <ul style="list-style-type: none"> <li>– cellular telephones</li> <li>– short-wave radio</li> <li>– AM, FM, TV</li> <li>– satellite communication</li> <li>– high definition TV</li> <li>– cable television (CATV)</li> <li>– facsimile</li> <li>– HAM radio</li> <li>– citizen band</li> <li>– two-way radio</li> </ul> </li> <li>• draw and explain a block diagram of a AM/FM communication systems</li> <li>• block diagram various RF communication systems such as cellular phones, cable.</li> </ul>	
Fabricating/Testing	<ul style="list-style-type: none"> <li>• construct a RF communication project</li> <li>• design an antenna to receive a radio signal to include:               <ul style="list-style-type: none"> <li>– determining length of antenna</li> <li>– impedance match</li> </ul> </li> <li>• evaluate completed projects.</li> </ul>	Project could link with ELT2010 Electro-assembly 2: <ul style="list-style-type: none"> <li>• AM/FM radio project kit</li> <li>• wireless speaker system</li> <li>• wireless microphone</li> <li>• short-wave antenna</li> <li>• wireless intercom system</li> <li>• garage door opener.</li> </ul>

**COURSE ELT2100: RADIO COMMUNICATION (continued)**

Concept	Specific Outcomes	Notes
Real-world Applications	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• list the Radio Frequency Spectrum (RFS) and its use in the local area</li> <li>• tour radio/TV station.</li> </ul>	Alberta frequency list.
Applied Mathematics/ Testing	<ul style="list-style-type: none"> <li>• describe signal present at each block of an AM receiver</li> <li>• identify the frequency present in each wave form with an oscilloscope</li> <li>• use an oscilloscope to determine period in seconds and frequency in Hertz (Hz).</li> </ul>	Vary the tuning and observe the changes, e.g., carrier frequency, modulating from local oscillating frequency to intermediate frequency.
Careers	<ul style="list-style-type: none"> <li>• research the conditions required to obtain a HAM radio licence</li> <li>• identify the careers in electronic communication</li> <li>• list the skills of a electronic technologist.</li> </ul>	

