

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"> • describe the principles of electromagnetic communication systems 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • drawing block diagrams to explain the following communication systems: <ul style="list-style-type: none"> – AM, FM radio – TV – short-wave radio – satellite communication – cellular telephone – cable television – two-way radio • explaining electromagnetic communication terms, such as: <ul style="list-style-type: none"> – carrier modulation/demodulation – amplitude modulation – frequency modulation – frequency spectrum – stereo – decoder – sidebands – oscillators. <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"> • demonstrate established laboratory procedures and safe work practices • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • demonstrating an understanding of the following circuits through experimentation and/or computer simulation: <ul style="list-style-type: none"> – Hartley oscillator – Colpitts oscillator – audio amplifier – tuned collector oscillator. <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"> • observed performance in following: <ul style="list-style-type: none"> – established laboratory procedures – avoidance of radiation hazards – avoidance of radio frequency burns. <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"> • observations of individual effort and interpersonal interaction during the learning process. <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"> • demonstrate appropriate safety techniques with respect to: <ul style="list-style-type: none"> – radiation hazards – radio frequency burns. 	

COURSE ELT2100: RADIO COMMUNICATION (continued)

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

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"> • list the Radio Frequency Spectrum (RFS) and its use in the local area • tour radio/TV station. 	Alberta frequency list.
Applied Mathematics/ Testing	<ul style="list-style-type: none"> • describe signal present at each block of an AM receiver • identify the frequency present in each wave form with an oscilloscope • use an oscilloscope to determine period in seconds and frequency in Hertz (Hz). 	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"> • research the conditions required to obtain a HAM radio licence • identify the careers in electronic communication • list the skills of a electronic technologist. 	

