

Module Title:	Satellite and Microwave Systems
Language of Instruction:	English
Credits:	5
NFQ Level:	6
Module Delivered In	1 programme(s)
Teaching & Learning Strategies:	Combination of lectures and practical laboratory sessions. Lectures will take the form of traditional theory and tutorials. Laboratory sessions take the form of individual & group work.
Module Aim:	To understand the application of information theory and digital communications concepts in the design of microwave wireless communication systems and to appreciate the operational conditions and constraints of modern microwave systems.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Understand terrestrial and satellite microwave transmission fundamentals.
LO2	Consider and select microwave antenna types appropriate to given scenarios.
LO3	Determine antenna installation considerations, physical, alignment and path loss.
LO4	Contrast the types of transmission lines associated with microwave and satellite systems.
LO5	Test and maintain terrestrial and satellite microwave transmission systems.
Pre-requisite learning	
Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
Incompatible Modules <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>	
No requirements listed	

Module Content & Assessment

Indicative Content

Fundamentals of Microwave Radio

Spectrum, propagation characteristics, Fresnel zone.

Fundamentals of Satellite Systems

Characteristics of Satellites, System Elements, Satellite Orbit Configurations, Frequency Spectrum Allocations, Satellite Network Architectures, Point-to-Multipoint Networks, Point-to-Point Networks, VSAT Networks, Propagation on the Earth-Space Link.

Microwave link Engineering

Antenna choice, positioning, Link Requirements, Electromagnetic Environments, Capacity, Feed Assemblies, Shields and Radomes, High-performance Antennas, High Capacity Antennas, Direct Radio Integration.

Transmission Lines

Types of Waveguide, Flanges, Pressurization, Dehydrators, Waveguide assembly.

Antenna installation

Antenna Path Alignment, Antenna Path Loss, Transmission Line Loss, Compass Readings and Azimuth Markers.

Testing and Maintenance

VSWR, Test Equipment, Maintenance.

Assessment Breakdown

%

Continuous Assessment

100.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Multiple Choice Questions	MCQ: The students will be given MCQs to assess their knowledge of terrestrial and satellite microwave systems during the semester.	1,2,3,4,5	60.00	n/a
Written Report	Each student will be given an aspect of satellite communications to research and report on. This will include a presentation to their peers at the end of the semester.	1,2,3,4,5	40.00	n/a

No Project

No Practical

No End of Module Formal Examination

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Multiple Choice Questions	MCQ: The students will be given MCQs to assess their knowledge of terrestrial and satellite microwave systems during the semester.	1,2,3,4,5	60.00	n/a
Written Report	Each student will be given an aspect of satellite communications to research and report on. This will include a presentation to their peers at the end of the semester.	1,2,3,4,5	40.00	n/a

No Project

No Practical

No End of Module Formal Examination

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lab/Lecture	Every Week	3.00
Independent Learning Time	Every Week	3.00
Total Hours		6.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EESYS_B	Bachelor of Engineering (Honours) in Electronic Engineering	4	Mandatory