

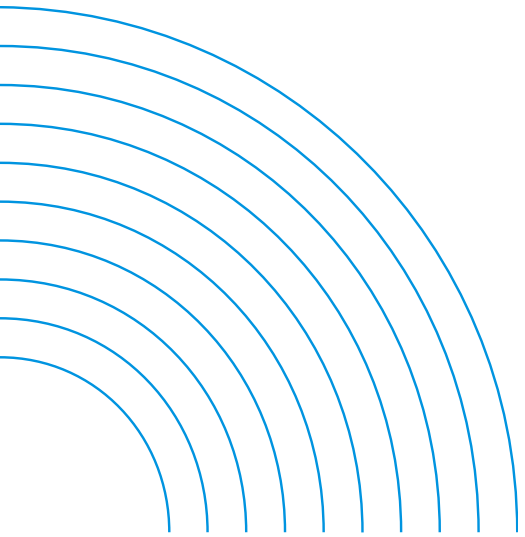
MASTER'S DEGREE IN
TELECOMMUNICATION
ENGINEERING

*Radiocommunication
Specialization*

Vigo, November, 2021

RADIOCOMMUNICATION

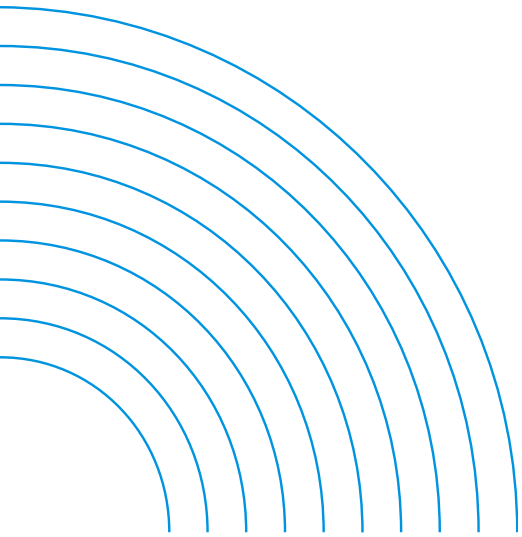
- Specialization divided into two blocks:
 - Radiocommunication I:
 - 2nd semester.
 - 3 *compulsory* 5ECTS *specialization subjects*:
 - Optical Communications
 - Antennas
 - Radio Laboratory
 - Radiocommunication II:
 - 3rd semester.
 - 3 *compulsory* 5ECTS *specialization subjects*:
 - Satellites
 - Broadband Radio Systems
 - Mobile and Wireless Communications.



RADIOCOMMUNICATION-I:

Optical Communications (V05M145V01207)

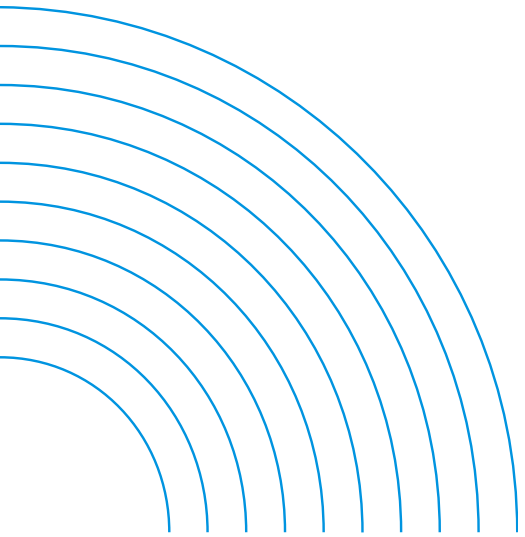
1. Photonic devices for optical communications: LED and laser sources, photodetectors, electro-optical and electro-absorption modulators, couplers, circulators, AWG, fiber amplifiers, semiconductor optical amplifiers, optical filters, single-mode, multimode and multicore fibers.
2. Noise models in transmitter, amplifier and receiver subsystems, calculation of their impact on the signal-to-noise ratio and error probability.
3. Digital transmission by optical fiber, and analog transmission in fiber-radio systems. IR and visible unguided systems.
4. Advanced fiber transmission systems: new modulation formats, coherent systems, nonlinear systems and dispersion management.
5. Specific technologies of WDM and DWDM optical networks. Topologies of long distance, metropolitan, regional and access optical networks.
6. Security in transmission and optical networks.



RADIOCOMMUNICATION-I:

Antennas (V05M145V01208)

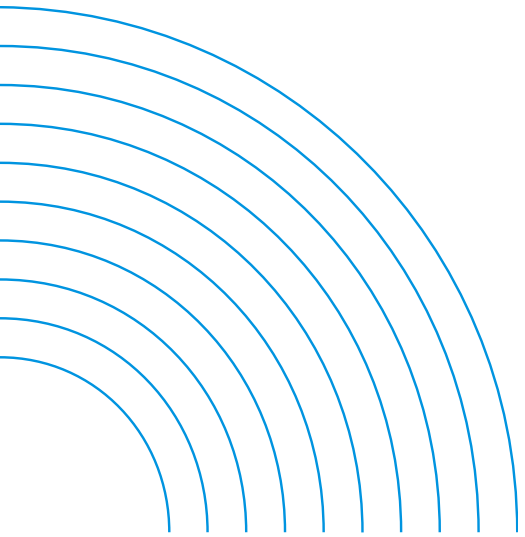
1. Electromagnetic basis of the phenomena of radiation and reception of signals by means of antennas.
2. Main parameters that characterize the behavior of transmitting and receiving antennas.
3. Types of antennas according to their applications and operating frequency.
4. Simulation models of antenna behavior and prediction of their characteristic parameters.
5. Antenna design for given specifications.



RADIOCOMMUNICATION-I:

Radio Laboratory (V05M145V01209)

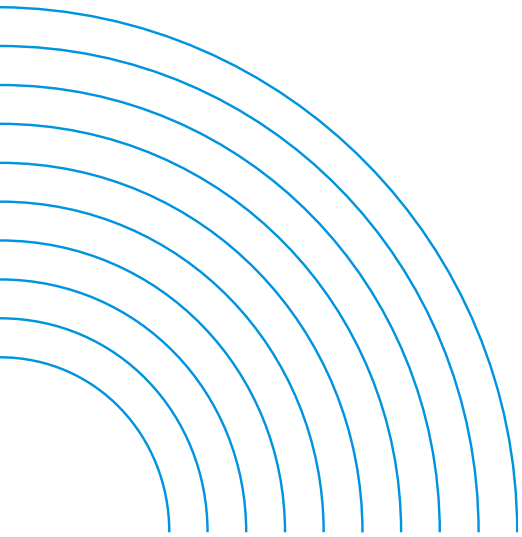
1. Basic instrumentation for radio frequency, microwave, millimeter and sub-millimeter measurements.
2. Configurations for measurements of the characteristic parameters of the different subsystems: impedance measurement, transmission and reflection, noise figure, dynamic range, and field levels.
3. Experimental characterization techniques of signal propagation mechanisms.



RADIOCOMMUNICATION-II:

Satellites (V05M145V01311)

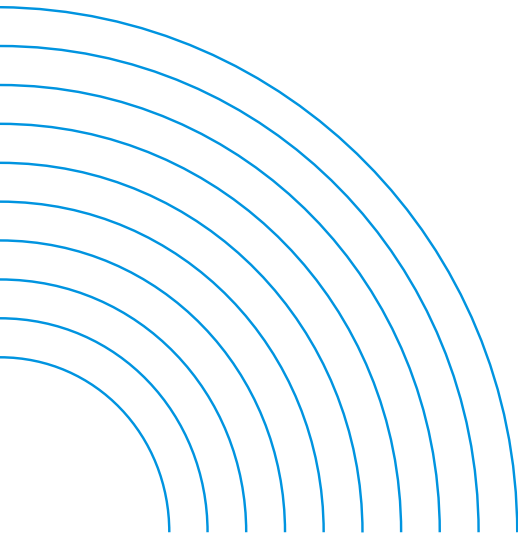
1. ECSS management standards of a space project.
2. Basic concepts of systems engineering applied to space projects.
3. Life cycle of a space mission.
4. Documentation corresponding to each engineering phase of a space mission.
5. Main technical studies and budgets in a space mission.



RADIOCOMMUNICATION-II:

Broadband Radio Systems (V05M145V01312)

1. Theoretical and experimental knowledge of broadband systems.
2. Knowledge of broadband designs of active and passive elements.
3. Fundamentals of broadband signal generation and reception.
4. Fundamentals of broadband signal measurement.



RADIOCOMMUNICATION-II:

Mobile and Wireless Communications (V05M145V01313)

1. Technology of the main mobile and wireless communications systems: 2G/3G/4G/5G, IoT (LoRa, LPWA...), vehicular communications.
2. Coverage and capacity calculation of a mobile communications site, and estimation of the cellular radio link.
3. Dimensioning and planning of mobile and wireless systems.
4. Quality analysis at radio interface level.
5. Mobile network deployment plan.
6. Radio technology selection according to each application.

