UNIVERSIDADE FEDERAL DO CEARÁ

FEDERAL UNIVERSITY OF CEARÁ
OFFICE OF THE VICE PROVOST FOR UNDERGRADUATION (PROGRAD)
COORDINATION FOR PROJECT AND CURRICULUM DEVELOPMENT
CURRICULUM DEVELOPMENT DIVISION

1. Academic unit offering the curricular component (Faculty, Center, Institute, Campus)**:**

Center of Technology

2. Department offering the curricular component (when applicable)**:**

Teleinformatics Engineering Department

3. Undergraduate course(s) offering the curricular component

Code of the Course	Name of the Course	Course Degree[1]	Curriculum (Year/ Semester)	Nature of the Component[2]	Semester of Offer[3]	Habilitation[4]
91	Telecommunications Engineering	Bachelor	2015.1	Optional	-	-

4. Name of the curricular component:
Radio Communication Systems

5. Code of the curricular component (filled by PROGRAD)**:**
TI0070

6. Prerequisites	No ( )	Yes (x)	
		Code	Name of the curricular component / activity
		TI0120	Communication Principles

7. Corequisite	No (x)	Yes ( )	
		Code	Name of the curricular component / activity

8. Equivalences	No ( )	Yes (x)	
		Code	Name of the curricular component / activity
		TI0031	Radio Communication Systems

9. Day period of the curricular component (more than one option can be selected)**:**
(x) Morning (x) Afternoon (x) Night

1 **Fill with *Bachelor (Engineer), Licenciate,* or *Technologist.***
2 **Fill with *Mandatory, Optional,* or *Elective.***
3 **Fill when mandatory.**
4 **When elective, fill with the habilitation or emphasis to which the curricular component is linked.**

10. Regime of the curricular component:

(x) Semester ( ) Yearly ( ) Modular

11. Justificatory for the creation/regulamentation of this curricular component

In communication systems based on the propagation of radio waves we have to consider the situations in which the electromagnetic wave suffers the influence of the environment. In this course we will study these influences and consider them in the design of communication systems.

12. Objectives fo the curricular component:

To enable students to analyze and design radio communication systems.

13. Syllabus:

Transmission Systems. Attenuation of radio waves. Radiometeorology. HF Communication Systems. Communication Systems in VHF, UHF and EHF. Regulations.

14. Program:

1. **Transmission systems:** frequency bands; types of service; transmission shafts; dependency: range service type - propagation mechanism.
2. **Radio wave attenuation:** propagation in free space; propagation on flat earth; propagation on the spherical earth; diffraction.
3. **Radiometeorology:** atmospheric refraction; trajectory of radio waves; concept of equivalent radius of Earth; atmospheric refraction conditions.
4. **HF communication systems:** frequency bands and applications; propagation in HF; types of antennas used in HF; system design in HF.
5. **VHF and UHF communication systems:** frequency bands and applications; propagation in VHF and UHF; antenna types used in VHF and UHF; systems design in VHF and UHF.
6. **EHF communication systems:** frequency bands and applications; propagation in EHF; types of antennas used in EHF; system design in EHF
7. **Regulations:** current standards; definitions of service types; standards for installation and alteration of technical characteristics of telecommunications station; forms.

15. Workload description

Number of Weeks:	Number of Credits:	Total Workload in Hours:	Theory Workload in Hours:	Practice Workload in Hours:
16	04	64	64	-

16. Basic bibliography:

1- Neto, V. Soares, Petrucci, L. August and Teixeira, P. S. Assis, “Sistemas de Propagação e Rádio Enlace”, Érica, 1999.

2- Hristo D. Hristov ,“Fresnel Zones in Wireless Links, Zone Plate Lenses and Antennas”, Artech House 2000.

3- Siwiak, Kazimierz,” Radiowave Propagation and Antennas for Personal Communications, Second Edition”, Artech House 1998.

4- Miyoshi, E. Mitsugo and Sanches, C. Alberto, “Projetos de Sistemas Radio”, Editora Érica, 2002.

5- Henry L. Bertoni, “Radio Propagation for Modern Wireless Systems”, Prentice-Hall, 1999.

17. Complementary bibliography:

1- Kerr, D. E., “Propagation of Short Radio Wave”, New York, 1951.

2- Picquenard, A., “Propagação das Ondas Radioelétricas nos Meios Naturais“ Livr. Freitas Bastos.

3- Silva, G. and Barradas, O., “Sistemas Radiovivibilidade”, Livros Técnicos e Científicos Editora Ltda, 1978.