



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:

Digital TV

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

TI0073

6. Prerequisites	No ()	Yes (x)	
		Code	Name of the curricular component / activity
		TI0056	Introduction to Information Theory

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

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

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), Licenciante, 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

The change in the standards of quality of TV systems and the recent introduction of digital TV in the world, and in particular, the recent definition of the Brazilian Digital Television System will produce, in the short and medium term, a demand by professionals who can work in this area.

12. Objectives fo the curricular component:

Several aspects are addressed in digital TV systems, including digital broadcasting, image processing, signal compression, audio, data multiplexing, streaming and interactivity, among others that make up the state of the art in digital TV standards.

13. Syllabus:

Introduction; Fundamentals of Digital TV; Video Compression; Audio Compression; Notions of Digital Transmission; Video Transmission; Video Multiplexing; Video Streaming and IPTV, Brazilian System of Digital TV.

14. Program:

1. **Introduction:** motivation, TV history; the beginning of digital TV.
2. **Fundamentals of Digital TV:** information unit; digital television; HDTV; interactivity; uplink channel; digital TV standards.
3. **Video Compression:** lossless signal compression; lossy signal compression; transforms; JPEG standard; estimation and motion compensation; H.261 standard; MPEG1 standard; MPEG 2 standard; H.263 standard; MPEG4 standard; H.264 standard (MPEG4 AVC).
4. **Audio Compression:** psycho-acoustics; MPEG1 layers 1, 2 and 3; MPEG2 ACC; MPEG-4 AAC.
5. **Notions of Digital Transmission:** baseband transmission; digital modulation: BPSK, PSK, QPSK, QAM, FSK, MSK; OFDM - Orthogonal Frequency Division Multiplexing.
6. **Video Transmission:** Terrestrial Transmission (DVB-T standard, ATSC standard, ISDB-T standard); Satellite Transmission (DVB: DVB-S, DVB-S2; ATSC; ISDB); Broadcasting via Cable (DVB; ATSC; ISDB); Video for Mobile (DVB-H standard; ISDB standard).
7. **Video Multiplexing:** MPEG Systems; Service Information: Electronic Program Guides; Conditional Access; Middleware: MHP - Multimedia Home Platform and GEM; Video Streaming and IPTV.
8. **Brazilian Digital TV System:** reference model; coding of source signals; transport layer; transmission and reception; middleware; interactivity channel.

15. Workload description

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

- 1- Arnaldo Megrich, Televisão Digital – Princípios e Prática, Editora Érika, 2009.
- 2- Michael Robin and Michael Poulin, Digital Television Fundamentals, McGraw-Hill, 2nd edition, 2000.
- 3- Marcelo Sampaio, Televisão Digital, Editora Érika, 2007.