USEEJ5 - Digital Communications (2)

Mis à jour le 04-03-2024

Code : USEEJ5

Unité spécifique de type mixte

4 crédits

Responsabilité nationale :
EPN03 - Electroniques, électrotechnique, automatique et mesure (EEAM) / Pascal CHEVALIER

Contact national :

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Présentation

Prérequis

Have a level bac + 2 in electronics (BTS, DUT, L2) and basis on mathematics for deterministic and random signals.

Objectifs pédagogiques

Obtain knowledge on transmission and digital communications techniques and systems.

Compétences

Upon completion of the subject, students will be able to:

Professional/academic knowledge and skills

1. skills in computing theoretical Bit Error Rate performance of modulations
2. skills in applying basic equalization techniques
3. able to perform link budgets at receivers, taking into account noise factors
4. skills in synchronization

Programme

Contenu

1. Low-pass equivalent channel and synchronous detection
2. Digital linear modulations :ASK, PSK, QAM
3. FSK modulations
4. Linear equalization
5. Maximum Likelihood Sequence Estimator equalization
6. Receivers architecture
7. Noise: physical meaning of varying noise types (thermal, Schottky, 1/f...); noise factor and noise temperature, modellization and optimization of the the signal to noise ratio
8. Non linearities: study techniques, modellization, non-linear distorsions, frequency changes, applications
9. Link budgets
10. Introduction to synchronization techniques, carrier estimation with several phase-lock techniques.

Modalités de validation

- Examen final

Description des modalités de validation

The course is validated if the mark is higher or equal to 10/20

Bibliographie

Titre	Auteur(s)
"Digital communications 2: Digital modulations", December 2015, Wiley-ISTE, pp. 334, (ISBN: 978-1-84821-846-8)	M. Pischella and D. Le Ruyet
Signals and Systems, Prentice Hall, 1997	A.V Oppenheim, A.S. Willsky, S. Hamid
Digital Communications, Mc Graw-Hill, 4th edition,2001	J. Proakis