

	UE-F3.2: Introduction to Communication Theory	Semester 1
Contributes to	MICAS	

Coordinators:	Philippe CIBLAT, Telecom Paris Mireille SARKISS, Telecom SudParis	
Volume:	30h	3 ects
Hours:	Lectures: 19.5h, Exercises: 6h, Labs: 3h	
Assessment:	2 Assignments and 1 Final Exam	
Language:	English	

Objectives:	The course provides the main mathematical tools and technologies for communication systems.	-
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Outcomes:	On completion of the course students should be able to:	
	<ul style="list-style-type: none"> • Design a communication system given some system requirements • Analyze the performance and compare systems • Understand the principles of error correcting codes 	-

Prerequisite	<ul style="list-style-type: none"> • Introduction to Probability and Statistics • Linear algebra 	-
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Syllabus	<ul style="list-style-type: none"> • Baseband/carrier signals • Multipath Channel modeling • Detection Theory: Maximum A Posteriori (MAP) and Maximum Likelihood (ML) detector • Gaussian channel receiver • Frequency-Selective channel <ul style="list-style-type: none"> – Linear and nonlinear receivers: Zero Forcing (ZF), Minimum Mean Square Error (MMSE), Decision Feedback Equalizer (DFE) – Orthogonal Frequency Division Multiplexing (OFDM) • Application to 4G • Introduction to channel coding • Linear block coding • Galois Fields • Cyclic coding 	-
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Bibliography:	<ul style="list-style-type: none"> • D. Tse, "Fundamentals of Wireless Communications", 2005. • A. Goldsmith, "Wireless Communications", 2005. • S. Lin and D. J. Costello, "Error Control Coding: Fundamentals and Applications", 2004. 	-
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