Jordan University of Science and Technology
Faculty of Engineering
Electrical Engineering Department

EE450 Communication Systems
Second Semester 2023-2024

Course Catalog
3 Credit Hours. Review of signals and systems: bandpass and lowpass signal representation, equivalent low-pass models. Amplitude modulation (AM) and demodulation, AM radio broadcasting and signal multiplexing. Angle modulation and demodulation: frequency modulation (FM) and phase modulation (PM) . Coherent and non-coherent detection. FM Radio Broadcasting and FDM. Bandpass and lowpass random processes: Noise representation and analysis: SNR analysis of AM and FM systems. Analog-to-digital conversion: sampling, quantization and waveform coding (pulse code modulation, differential pulse code modulation and delta modulation). TDM and pulse modulation techniques: PAM, PPM, PWM.
Teaching Method: On Campus

Text Book	
Title	Fundamentals of Communication Systems
Author(s)	Proakis J. and Salehi M.
Edition	2nd Edition
Short Name	Textbook
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref # 1	Communications Systems	Simon Haykin	4th Edition	
Ref # 2	Principles of Communications	R. E. Ziemer and W. H. Traner	4th Edition	
Ref # 3	Digital and Analog Communication Systems	Leon Couch II	6th Edition	

Ref # 4	Communication Systems	A. B. Carlson	3rd Edition	
Ref. 6	Principles of Analog and Digital Communications,	J.D. Gibson	2nd Edition	
Ref. # 7	Modern Digital and Analog Communication Systems	Lathi P. and Zhi Ding	5th Edition	

Instructor	
Name	**Dr. Ibrahim Ghareeb**
Office Location	E1L3
Office Hours	
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Class Schedule & Room

Section 1:
  Lecture Time: Sun, Tue, Thu : 08:30 - 09:30
  Room: E2114

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
243601	EE360 Random Signal Analysis	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction to Communications systems	From **Textbook**
Weeks 1, 2, 3, 4	Representation of Signals and systems	From **Textbook**
Weeks 4, 5, 6, 7	Amplitude Modulation	From **Textbook**
Weeks 8, 9, 10	Angle Modulation	From **Textbook**
Weeks 10, 11, 12	Effect of Noise in Analog Communication systems	From **Textbook**
Weeks 12, 13, 14, 15	Analog-to-Digital Conversion and Pulse Modulation Techniques	From **Textbook**

Mapping of Course Outcomes to Program Outcomes	**Course Outcome Weight (Out of 100%)**	**Assessment method**

The ability to identify different techniques in analog communications, in particular, signals and systems in time and frequency domain, AM, FM and PM modulation and detection with bandpass transmission, the principles of sampling theorem and pulse modulation techniques and use them in block-diagram level design of communication systems.	40%	Final, First, Second
Describe and motivate the fact that the implementation and development of analog communication technology requires mathematical modeling and problem solving.	10%	Final, First, Second
Apply mathematical modeling to problems in communication systems, and explain how this is used to analyze and synthesize methods and algorithms within the field.	10%	Final, First, Second
Use the knowledge of statistical theory and evaluate the performance of analog communication system and pulse modulation techniques in the presence of additive noise.	20%	Final, Second
Apply and use the basic tenets of sampling theorem and pulse modulation techniques as pertaining to communications, and perform basic calculations of relevant properties. Compare different techniques and judge the applicability of different techniques in different situations.	20%	Final

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7

Evaluation	
Assessment Tool	**Weight**
Final	40%
First	30%
Second	30%

Policy	
Prerequisites by topic	Prerequisites by topic: signal and system analysis, probability; random variables and stochastic processes, Prerequisites by course: EE 260, EE 360

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