

**Department of Electrical and Computer Engineering  
Florida International University – HEBUT program**

**EEE 3514 - COMMUNICATION SYSTEMS**

**Instructor:** Mubarak Mujawar  
**Email:** mmujawar@fiu.edu  
**Department Phone:** (305) 348-2807  
**Location:** Online

**FIU Catalog Description\*:**

An introductory course in the field of analog and digital communication systems. Transmitters, receivers and different modulation and demodulation techniques are studied.

A basic treatment of noise is also included. (3 Credits)

**Prerequisites:** EEL 3112 or EEL 3110, EEL 3135, EIN 3235

**Textbook:**

Digital and Analog Communication Systems, L.W. Couch II, 8<sup>th</sup> ed., Pearson 2013

**Learning Outcomes:**

1. Understand the difference between analog and digital communication systems.
2. Understand the properties of signals and noise.
3. Analyze energy waveforms and power waveforms.
4. Understand Fourier transform and spectra.
5. Understand power spectral density and autocorrelation functions.
6. Analyze bandlimited signals and noise.
7. Analyze pulse amplitude and pulse code modulation.
8. Understand delta modulation and time/frequency division multiplexing.
9. Understanding of bandpass waveforms and systems.
10. Analyze bandpass transmitters and receivers.
11. Analyze amplitude, phase and frequency modulation systems.
12. Understand FM broadcast technical standards.
13. Analyze bandpass digital communication systems.
14. Understand  $E_b/N_o$  communication systems.
15. Calculate link budget for satellite communications systems.
16. Analyze signal-to-noise ratio for wireless systems.
17. Calculate link budget for a fiber optic systems.
18. Calculate link budget for satellite communication systems.
19. Understand spread spectral systems.
20. Understand cellular telephone systems.
21. Calculate link-budget for cellular systems.

**Topics Covered:**

1. Analog techniques in communication systems
2. Digital techniques in communications systems
3. Baseband and bandpass signals
4. Modulation techniques for communications systems
5. Link budget in communications systems

**Relationship of course to program outcomes:**

In the course EEE 3514 the student will have to show

- (a) an ability to apply knowledge of mathematics, science and engineering
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (e) an ability to identify, formulate, and solve engineering problems (homework)
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (SPICE, MATLAB Simulations)
- (l) an ability to apply probability and statistics
- (m) an ability to apply knowledge of advanced math (D.E., Linear Algebra, Complex Variables, Discrete Math)

**Grading Policy**

<b>Grading Policy:</b>						
			<b>A</b>	<b>95-100</b>	<b>C</b>	<b>73-75</b>
Assignments	30%		<b>A-</b>	<b>90-94</b>	<b>C-</b>	<b>70-72</b>
Midterm	35%		<b>B+</b>	<b>86-89</b>	<b>D+</b>	<b>66-69</b>
Final Exam	35%		<b>B</b>	<b>83-85</b>	<b>D</b>	<b>63-65</b>
			<b>B-</b>	<b>80-82</b>	<b>D-</b>	<b>60-62</b>
Total	100%		<b>C+</b>	<b>76-79</b>	<b>F</b>	<b>0-59</b>