2309 EIE353 Course Outline

Subject Code	:	EIE353
Subject Title	:	Advanced Communication Systems
Course Type	:	Compulsory
Level	:	4
Credits	:	3
Teaching Activity	:	Lecture 45 hours
	:	
Prior Knowledge*	:	Principles of Communications Signals and Systems

Class Schedule :

Class	Week	Time	Classroom	Date
D1	TUE	9:00-11:50	C308	04/09/2023 - 17/12/2023

Instructor	:	Li Jian Qing
Contact Number	:	(853)88972194
E-mail Address	:	jqli@must.edu.mo
Office	:	A219
Office Hour	:	Monday: 14:30 - 17:30 Tuesday: 14:30 - 17:30 Wednesday: 14:30 - 17:30 Thursday: 10:00 - 11:00

COURSE DESCRIPTION

This subject aims to provide the basic concepts and characteristics of the modern communication systems including telephone communication, mobile communication, optical fiber communication and satellite communication. The subject discusses the transmission characteristics of communication channels, elements of various communication systems and their working principles, key technologies, developmental trend, and typical applications.

TEXT BOOK

Required Text Book:
No recommended textbook, but the learning materials will be provided to students during the classes.

Reference Book:
1. Book title: Digital Communications
   Author/Editor: J. G. Proakis
   Edition: 5

ISBN: 9780071263788
Publisher: McGraw Hill
Date: 2001

2. Book title: Wireless Communications
Author/Editor: Andrea Goldsmith
Edition: 1
ISBN: 9780521837163
Publisher: Cambridge
Date: 2005

3. Book title: Contemporary Communication Systems: Using MATLAB and Simulink
Author/Editor: J. G. Proakis
Edition: 3
ISBN: 9781111990176
Publisher: Thomson
Date: 2013

INTENDED LEARNING OUTCOMES

Upon successful completion of this subject, students will be able to:

1. Understand the basic concepts of communication systems.
2. Analyze the characteristics of communication channels.
3. Understand the mechanism of optical transmission systems.
4. Explain the principle of telephone systems.
5. Explain the principle of mobile communication systems.
6. Explain the principle of optical communication systems.
7. To be aware of the applications of various communication systems.
8. To be aware of the developmental trend of various communication systems.

Weekly Schedule

Week	Topic	Hours	Teaching Method
1	Introduction 1-1 Communication Systems Today 1-2 Key Concepts in Communications Systems	3	lecture
2	Digital Transmission Fundamentals 2-1 Digital representation of analog signals 2-2 Characterization of Communication Channels 2-3 Line coding	3	lecture

3	2-4 Modems and digital modulation 2-5 Error detection and correction	3	lecture
4	Transmission systems 3-1 Multiplexing 3-2 SONET 3-3 Transport Networks	3	lecture
5	Telephone Communication Systems 4-1 Introduction to Telephone Communication Systems 4-2 Basic Elements of Telephone Switched Systems	3	lecture
6	4-3 Circuit Switches 4-4 Signaling 4-5 Traffic in Telephone Network	3	lecture
7	Midterm Review	1	lecture
	Midterm exam	2	exam
8	Mobile Communication Systems 5-1 Overview of Wireless and Personal Communication 5-2 Propagation Characteristics of Electrical Wave 5-3 The Main Adopted Technologies of Mobile Communication	3	lecture
9	5-4 The Networking Technologies of Mobile Communication 5-5 Elements of Digital Cellular Mobile Communication Networks 5-6 Voice Coding and Digital Modulation	3	lecture
10	5-7 Time Division Multiplexing and Technologies of Line Coding 5-8 Code Division Multiplexing Technologies 5-9 The Third Generation Mobile Communication	3	lecture
11	Optical Fiber Communication Systems 6-1 Characteristics of Optical Fiber Communication 6-2 Principles and Characteristics of Optical Fiber	3	lecture
12	6-3 Elements of Optical Fiber Communication Systems 6-4 The Main Adopted Technologies of Optical Fiber Communication Systems	3	lecture

13	6-5 The New Technologies of Optical Fiber Communication 6-6 Introduction to Typical Optical Fiber Communication Systems	3	lecture
14	Microwave and Satellite Communication Systems 7-1 Introduction 7-2 Characteristics of Microwave Transmission Communication Channels 7-3 Elements of Microwave Relay Communication System 7-4 Basic Technologies of Digital Microwave Communication 7-5 Characteristics of Satellite Communication	3	lecture
15	7-6 Elements of Satellite Communication Systems 7-7 The Modulation and Multiple Access Technologies of Satellite Communication 7-8 Introduction to Synchronous and Mobile Satellite Communication Systems	2	lecture
	Final Review	1	lecture
16-17	Christmas Recess		
18	Final Exam	2	exam

ASSESSMENT APPROACH

Assessment method	**% weight**
1.Attendance (Class participation)	**10%**
2.Assignment	**10%**
3.Midterm exam	**30%**
4.Final exam	**50%**
Total	**100 %**

Guideline for Letter Grade:

Marks	Grade	GPA
93-100	A+	4
88-92	A	4
83-87	A-	3.7
78-82	B+	3.3
72-77	B	3.0
68-71	B-	2.7
63-67	C+	2.3
58-62	C	2.0
53-57	C-	1.7
51-52	D+	1.3
50	D	1.0
0-49	F	n/a

Notes:
Students will be assessed on several assessment items (i.e. attendance, assignment midterm exam, experiment exam and final exam).
The attendance evaluates the student's participation of discussion in the classes.
The assignment evaluates the student's understanding of the concepts of communication systems.
The midterm exam and the final exam comprehensively evaluate the student's understanding of the theory of communication systems.