King Saud University
College of Computer and Information Sciences
Department of Computer Engineering

CEN 342 – INTRODUCTION TO DATA TRANSMISSION 3(3-0-1)
Semester I, Academic Year 2018-2019
Required Course
Time: Section 22156 - (M W 8:00-10:00) in Classroom (0160 31 1 A 095)

Professor Information

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Course Description (catalog)

Introduction to communication systems; Network architecture and the OSI reference model; Transmission media; Transmission Impairments; Data encoding; Data Synchronization; Multiplexing.

Prerequisites

- Courses

- CEN 340

- Topics

- Signals and systems
- Physics (electricity and electromagnetism)
- Logic design I

Textbook(s) and/or Other Required Materials

Primary:

- Data and Computer Communications, by W. Stallings, Prentice Hall.

Supplementary:

- B. A. Forouzan, Data Communications and Networking, McGraw Hill.
- F. Halsall, Data Communication, Computer Networks and Open Systems, Addison-Wesley.
- Tanenbaum, Computer Networks, Prentice Hall.

Course Learning Outcomes

This course requires the student to demonstrate the following:

1. Understand the **OSI model** for computer networks protocols.
2. Learn the fundamentals of **data transmission principles**: time and frequency representation of signals, relation between data rate and channel bandwidth, and transmission impairments.
3. Identify the characteristics of the various **transmission media**.
4. Be able to identify and characterize the various **data encoding** techniques, and assimilate their design principles.
5. Learn the principles and operation of **synchronous and asynchronous transmissions**.
6. Understand the principles of **error detection and control**.
7. Learn the operation and architecture of the various **multiplexing techniques**, and be able to design simple data multiplexing systems.

Major Topics covered and schedule in weeks

OSI model for computer networks protocols	1
Introduction to Data Transmission, Impairments, Channel Capacity	3
Guided and unguided media transmission	2
Signal encoding techniques	3
Synchronous and asynchronous transmissions	1
Error detection and correction	2
Multiplexing	2

Tentative Out-of-class Assignments and dates

HW1: OSI model for computer networks protocols
HW2: Fundamentals of data transmission principles
HW3: Characteristics of the various transmission media
HW4: Data encoding techniques
HW5: Synchronous/asynchronous transmission
HW6: Error detection and correction
HW7: Multiplexing

Assessment Plan for the Course:

Student's performance in homework, quizzes, and exams.

Contribution of Course to Meeting Professional Component:

Curriculum Discipline	Percentage
Mathematics and Basic Science	10%
Engineering Science	60%
Engineering Design	30%
General Education	

Relationship of Course to Program Outcomes

Outcome	Outcome Description	Level of Contribution
(a)	An ability to apply knowledge of mathematics, science, and engineering	✓
(b)	An ability to design and conduct experiments, as well as to analyze and interpret data	
(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	
(d)	An ability to function on multidisciplinary teams	
(e)	An ability to identify, formulate, and solve engineering problems	✓
(f)	An understanding of professional and ethical responsibility	
(g)	An ability to communicate effectively	
(h)	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	✓
(i)	A recognition of the need for, and an ability to engage in life-long learning	
(j)	A knowledge of contemporary issues	✓
(k)	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	✓

Evaluation

Homework Assignments and Quizzes	10%
Midterm Examination 1	25%
Midterm Examination 2	25%
Final Examination	40%
Total	**100%**

Polices

- **No late** homework will be accepted.
- The quizzes may be pop or announced, and may be given at anytime during class-time
- Homework assignments are considered individual efforts. However, students are encouraged to share thoughts with others. **ABSOLUTELY NO COPYING**. Academic dishonesty cases will be dealt with severely.
- All exams are closed book.
- The final exam will be comprehensive.

Relationship of course to program objectives

1. Provide robust understanding of the fundamental areas of computer engineering.
2. Succeed in lifelong learning programs to remain current professionals contributing to the advancement of the global industry.
3. Build strong ethical and behavior system that will assist graduates to face real-life professional and general challenges.

Current Instructor, Department, Office Hours and Date

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Updated on: Semester I, AY 2018-2019