

## Course Description

### Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he/she has made the most of the available learning opportunities. They must be match to the description of the programe.

1. Educational Institution	Shatt Al-Arab University College			
2. Scientific Department / Center	Computer Technology Engineering			
3. Course name/code	Communication fundamental			
4. Available forms of attendance	Weekly			
5. Semester/Year	2021/2020			
6. Number of study hours (total)	120 hours	Number of hours per week		
		theoretical	practical	Total
		2	2	4
7. Date of preparation of this description	2 – 10 - 2022			
<b>8. Course Objectives:</b> <ul style="list-style-type: none"><li>• A- Knowing the principles and basics of the communication system</li><li>• b- Understand and know the types of signs and compare them</li><li>• c- a in communications understanding and knowledge of series and Fourier transforms from time domains to frequency domains and their application</li><li>• d- A in Communications Understand and know the types of passive and active filters and their application</li><li>• c- Understand and know the types of analog modulation, amplitude modulation and frequency modulation</li><li>• H - Understand and know the transmission line in communications and Smith diagrams</li><li>• The practical applications of Fourier transforms</li></ul>				

- D- Practical applications of inert and active filters
- Y- Practical applications of analogue modulation (amplitude modulation and frequency modulation)

## 9. Course Outcomes and Teaching Methods, Learning and Evaluation

**A- The cognitive objectives:** If the student successfully completes this course, he will be able to:

A 1- Learn about the types of signals, systems and basics of communication

A 2- Identifying Fourier series and transforms and their applications in the field of communications

A 3- Types of filters, their principle of operation and their practical applications in the field of communication systems

A4- Knowing about embedding in communications, its benefits, causes and types of embedding

A5 - Understand the analogue modulation of amplitude and frequency, their types, and the applications used in telecommunications

A6 - Identify the transmission line in communications and applications used in Smith Diagrams

**B . Course Skill Objectives:** If the student successfully completes this course, he or she will be able to:

B1 - Calculate the resulting frequencies from Fourier transforms

B2 - How to design filters of all kinds, passive and active, according to certain frequencies, and know the cutting frequencies

B3 - How to modulate and load the signal by analogue modulation with amplitude and frequency and calculate parameter values

Modulation and rectified waves with amplitude and frequency according to the input voltage and frequency

### Teaching and learning methods

Academic lectures that contribute to laying a strong and solid foundation to support the student's knowledge hunting The practical laboratory that provides practical experience to the student through practical experiences, which in turn supports and enhances the understanding and awareness of the theoretical side

### Evaluation Methods

Interactive assessment that takes place directly between the student and the professor, and it is one of the methods of feedback that is adopted

The faculty members should evaluate the teaching and learning process

Periodic written tests that provide information on the extent to which the student follows the scientific content and the extent of his interaction with

The material given by the instructor

The quarterly exams and the middle episode in which the student's interest and follow-up of the scientific material was assessed on both sides

Theoretical and skillful during the whole semester

Final exams, which are the final episode in evaluating the student and the extent of his interaction and interest in the scientific material during a year full course

**C. Sentimental and Valuable Objectives:** If the student successfully completes this course, he will be able to:

C 1- Cultivating a spirit of creativity among students and making sure that they find innovative solutions to various problems

C 2- To develop students' ability to work collectively as effective teams that produce outstanding results

C 3 - Develop a sense of responsibility among students and psychological preparation to bear the burdens placed on their shoulders

C 4- Develop the values of diligence and perseverance to complete work to reach satisfactory results

### **Teaching and learning methods**

Stimulating the creative side by posing different problems to the students and urging them to find appropriate solutions Forming work teams whose results are evaluated and their structure is periodically changed to develop the spirit of cooperation and development and motivate Students to make unremitting efforts to work in different circumstances

### **Evaluation Methods**

The results are presented in a classroom to be discussed and the rest of the learners participate in the discussion.

**d. General and qualifying skills transferred (other skills related to employability and personal development).**

- D1. Build ideas and communicate them effectively orally and in writing.
- D2. Time management and work within deadlines.
- D3. Participate constructively in groups.
- D4. Search for information and use of information technology.

**Teaching and learning methods**

A practical programming problem in the field of specialization is addressed and groups of students (the number of students in each group ranges from 3 to 4 students) for the purpose of finding a solution to that problem, where each group writes and presents a report of the results of its work within a specified period of time.

**Evaluation Methods**

The results are presented in a row to be discussed and the rest of the totals participate in the discussion.

## 10. Course Structure

Al, Week	Hours	Required Learning Outcomes	Name of the unit and/or subject	Method of education	Evaluation Method
3+2+1	6 theoretical + 6 practical	Introduction To Communications Fundamentals	Types of signals and types systems and system general communication	Theoretical presentation With the help of With Charts Illustrative + practical lectures	Achievement test + Discussion and question
6+5+4	6 theoretical + 6 practical	Fourier Series	spectrum of signals and use theory Parseval and spectrum of functions Trigonometric and complex	Theoretical presentation With the help of With Charts Illustrative + practical lectures	Achievement test + Discussion and question
9+8+7	6 theoretical + 6 practical	Fourier Transform	Fourier transform properties Representation of periodic functions	Theoretical presentation With the help of With Charts Illustrative + Practical Lectures + Panel Discussions	Achievement test + Discussion and question + and answer my class
+11+10+12	6 theoretical + 6 practical	Filters	Types of passive filters and effective filter design and its applications in systems Telecommunications	Theoretical presentation With the help of With Charts Illustrative + Practical Lectures + Panel Discussions	Achievement test + Discussion and question + and answer my class
+14+13+16+15+17	10 theoretical + 10 practical	Amplitude Modulation	Types of Amplitude Modulation and coefficient calculations Embedding and signal generation Modified and restored and total voltage calculations Pregnant signal voltage	Theoretical presentation With the help of With Charts Illustrative + Practical Lectures + Panel Discussions	Achievement test + Discussion and question + and answer my class

+19+ 18 +21+ 20 22	10 theoretical + 10 practical	Frequency Modulation	Types of Frequency Modulation and coefficient calculations Embedding and signal generation Modified and restored and total voltage calculations	Theoretical presentation With the help of With Charts Illustrative + Practical Lectures + Panel Discussions	Achievement test + Discussion and question + and answer my class
24+2 3	6 theoretical + 6practical	Noise In Communication System	types of noise in Modulation scaling and frequency Modulation	Theoretical presentation With the help of With Charts Illustrative + Practical Lectures + Panel Discussions	Achievement test + Discussion and question + and answer my class
+26+ 25 27	6 theoretical + 6practical	Transmission Lines	Definition of transmission line And types of transmission line and types Losses in the transmission line	Theoretical presentation With the help of With Charts Illustrative + Practical Lectures + Panel Discussions	Achievement test + Discussion and question + and answer my class
+29+ 28 30	6 theoretical + 6practical	Smith Chart	apply Smith Chart in the calculation of Impedance and losses in transmission line	Theoretical presentation With the help of With Charts Illustrative + Practical Lectures + Panel Discussions	Achievement test + Discussion and question + and answer my class

12. Infrastructure	
1 Required textbooks	<b>“Object-Oriented Programming in C++”, 4<sup>th</sup> Edition, Robert Lafore, Sams Publishing, 2002.</b>
2 Key references (sources)	
a. Recommended books and references (scientific journals, reports,.... )	<b>“CPA: Programming Essentials in C++”, C++ INSTITUTE, 2016.</b>

b. Electronic references, websites ....	<b>“C++ Tutorial”</b> , tutorialspoint. <a href="https://www.tutorialspoint.com/cplusplus/index.htm">https://www.tutorialspoint.com/cplusplus/index.htm</a>

### 13-Course improvement Plan

Increasing the number of hours of the theoretical lecture to three hours instead of the current two hours, where the extra hour is devoted to discussing additional methods and programming examples while expanding the establishment of panel discussions leading to a better understanding of the vocabulary of the course.