زانكۆى پۆليتەكنيكى ھەولێر
ERBIL POLYTECHNIC UNIVERSITY

Module (Course Syllabus) Catalogue

2022-2023

College/ Institute	Erbil Technology College
Department	Automation Industrial Technology Engineering
Module Name	PCB
Module Code	MPC503
Degree	Technical Diploma ☐ Bachelor ☑ High Diploma ☐ Master ☐ PhD ☐
Semester	Five
Qualification	MSc Electronic & control Engineering
Scientific Title	Lecturer
ECTS (Credits)	5
Module type	Prerequisite ☐ Core ☑ Assist. ☐
Weekly hours	3
Weekly hours (Theory)	( )hr Class	(81)Total hrs Workload
Weekly hours (Practical)	(3)hr Class	(98)Total hrs Workload
Number of Weeks	14
Lecturer (Theory)	Brzo Aziz Qadir
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Lecturer (Practical)	Harbe Wso Qadir
E-Mail & Mobile NO.	
Websites	www.Epu.edu.iq

Directorate of Quality Assurance and Accreditation   بەڕێوەبەرايەتى دڵنيايى جۆرى و متمانەبەخشين

Course Book

Course Description	This course will teach teams of students how to design and fabricate PCB for prototyping as well as in Industrial Production environment. This will help students to innovate faster with electronics technology.
Course objectives	The goal of this course to prepare students to enter the fast-paced world of electronics by applying the theoretical knowledge, learned in their foundation courses on analog and digital electronics, on a printed circuit board. Students will realise at least one printed circuit board project during the course.
Student's obligation	The presence of students in both lectures and Lab will have additional credit .He /She is required to continuously follow the lectures ,Submits homework and reports .Anticipate Tests or quizzes any time in Class or Lab
Required Learning Materials	Psychics ,Electronic ,Digital Electronic and Mathematics

Evaluation		Task	Weight (Marks)	Due Week	Relevant Learning Outcome
		Paper Review			
	Assignments	Homework	10		
		Class Activity			
		Report	10		
		Seminar			
		Essay			
		Project	5		
	Quiz		10		
	Lab.		10		
	Midterm Exam		16		
	Final Exam		40		
	Total				

Specific learning outco4me:	1) Identifying the parameters of passive and active electronic components from technical datasheets 2) Schematic design of electronic circuits and simulation of the designed circuit 3) Designing pcb footprints of electronic components 4) Describing fundamentals of pcb design 5) Describing multilayer (2-32) pcb design 6) Describing the fundamentals of analogue circuit design on pcb 7) Describing the fundamentals of high speed digital circuit design on pcb 8) Explaining signal integrity and differential signal routing and crosstalk 9) Describing the fundamentals of power circuit and RF circuit design on pcb 10) Explaining pcb manufacturing processes, gerbera creation and IPC standards 11) Defining EMC guidelines for pcb layout
Course References:	Title !-Printed Circuit Boards: Design, Fabrication, Assembly and Testing Author R. S. Khandpur Publisher McGraw-Hill, 2006 2-High Performance Printed Circuit Boards Charles A. Harper 3- Electronic Packaging and Interconnection Handbook 4/E Charles A. Harper McGraw Hill Professional, 2005 - Technology & Engineering - 1000 Pages. 4-PCB Fabrication user guide.:http//wikihow.com.

Practical Topics	**Week**	**Learning Outcome**
Introduction to PCB manufacturing machines Understanding the manufacturing process of PCB	1	Define PCB
Full-wave Bridge Rectifier	2	Learn property of power supply
A stable or Mono-Stable Multi-vibrator Using IC555	3	Learn different types of vibrator

RC Phase shift Oscillator using transistor	4	Distinguish between all types of oscillator
Full Adder using Half Adder	5	Given application of full adder and half adder
4-bit or MOD N counter using D Flip- flop or JK flip flop	6	Given application different types of counter
`4-bit shift-register using JK flip-flop in any one of PIPO/SIPO/PISO/SISO Modes`	7	Solve the practical examples for Registers
Square wave Oscillator using Op 741	8	Explain the square wave oscillator
Sinusoidal Oscillator using Op-amp.	9	Using OP for oscillator circuit
Sinusoidal Oscillator using BJT.	10	Using BJT for oscillator circuit
Sinusoidal Oscillator using JFET	11	Using JFET for oscillator circuit
Active filter circuit using Op-amp	12	Design active filter circuit projects
Design and fabricate PCB for one project.	13	Design PCB circuits for given student projects

Extra notes:

I will assess the students continuously through their activities in the class. Any student with thoughts about learning, and suggestions of different way of dealing with difficulties and problems will be very welcomed.

Showing relevant laboratory equipment, technical videos, and other academic activities are part of the course model.

External Evaluator

General evaluation of course objectives and content.

General evaluation of lectures/ Practical sessions.

General evaluation of lecturer.