The Republic of Iraq
Ministry of Higher Education and Scientific Research
Scientific Supervision and Evaluation Authority

University: Shatt Al-Arab University College
College: Shatt Al-Arab University College
Department: Department of Computer Technology Engineering
The second stage
Name of the lecturers: Asst.prof. Dr. Mazin Abdulelah Alawan
..Scientific title: Asst.prof

weekly lesson schedule

Course Lecturer	**Asst.prof. Dr. Mazin Abdulelah Alawan**			
e-mail	**drmazinalwan@sa-uc.edu.iq**			
Title	Instrumentation and measurements			
Course Coordinator	**Annual**			
Course Objective	**• Getting acquainted with measuring devices and international units of measurement, especially those related to electrical engineering**			
Course Description	**•Analyzing the work of the components of the measurement system and determining the duties of each of them in detail.** **•Classification of measuring devices and designing some of them.** **•Proficiency in measurements that can be made on the electric wave.** **• Designing a system for sensing physical quantities and converting them into electrical signals using sensors.**			
Textbook	**Measurement and Instrumentation Principles : by *Alan S. Morris.* \third edition 2003 \ Butterworth-Heinemann**			
References	Introduction to INSTRUMENTATION AND MEASUREMENTS :by Robert B. Northrop \ **Second Edition © 2005 by Taylor & Francis Group, LLC**			
final exam 60	**project**	**daily exams**	**lab**	**Semester daily exams**
	–	**3**	**5**	**12**
General Notes				

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Week	Date	Topics Covered	Number of Hours	Notes
1	**2-10-2022**	Units of measurements SI system ,block diagram and description of measurement system components .	**2**	
2	**9-10-2022**	Active and passive instruments . Analogue and digital instruments .	**2**	
3	**16-10-2022**	Important sources of instrument reading error ,introduction to signal processing element of measurement system	**2**	
4	**23-10-2022**	1^{st} order and 2^{nd} order LPF design for measurement signal noise removing .	**2**	
5	**30-11-2022**	Op. amp application in signal processing :Signal amplification and attenuation ,signal integration and differentiating.	**2**	
6	**7-11-2022**	Op. amp application in signal processing :signals summing , voltage follower application in instrument protection and inputs buffering .	**2**	
7	**14-11-2022**	Digital instruments basics :analogue to digital convertors ,sampling ,quantization .	**2**	
8	**21-11-2022**	Digital instruments basics :design of computerized measurement system (protocol ,components ,usage)	**2**	
9	**28-12-2022**	Digital instruments basics :flash ADC design principles and implementation .	**2**	
10	**4-12-2022**	Magnetic field measuring devices basics :moving coil instrument ,moving iron instrument .	**2**	
11	**11-12-2022**	Magnetic field measuring devices : clamp on meter . Electric field devices : electro static voltmeter .	**2**	
12	**18-12-2022**	Ohm meter : multi range ohmmeter design ,main sources of error , Light meter basic principles .	**2**	
13	**25-12-2022**	Design of multi range voltmeter (rules ,calculations ,examples) .	**2**	

14	**2-1-2023**	Design of multi range ammeter (rules ,calculations ,examples) .	**2**	
15	**28-2-2023**	Make before break switch basics ,determination of voltmeter and ammeter sensitivities .	**2**	
16	**7-3-2023**	Multi range instruments worked examples solving .	**2**	
17	**14-3-2023**	Digital instruments :measuring frequency (frequency counter) basics ,Events counter basics and usage .	**2**	
18	**21-3-2023**	An introduction to wave form generation :what is wave form ,wave form types .	**2**	
19	**28-3-2023**	An introduction to wave form generation : (function generator basics) ,function generator building blocks .	**2**	
20	**3-4-2023**	Cathode ray oscilloscope :CRT internal construction and building blocks jobs .	**2**	
21	**10-4-2023**	Cathode ray oscilloscope :internal control circuits building blocks jobs .	**2**	
22	**17-4-2023**	Measurement signal recording :Galvanometric recorder ,Ultra violet light recorder .	**2**	
23	**24-4-2023**	Measurement signal recording : analogue storage oscilloscope ,digital storage oscilloscope	**2**	
24	**1-5-2023**	Sensor technologies basics :what is sensor ?,why we need sensor ? ,examples of sensor .	**2**	
25	**8-5-2023**	Analogue sensor :basics ,sound sensor ,thermocouple .	**2**	
26	**17-5-2023**	Light dependent resistor LDR ,LDR applications	**2**	
27	**24-5-2023**	Digital sensor :basics ,measuring rotating shaft speed using light sensor .	**2**	
28	**31-5-2023**	Metric Prefix Table worked examples .	**2**	
29	**7-6-2023**	Wheatstone D.C. bridge .	**2**	
30	**13-6-2023**	Wheatstone D.C. bridge example .	**2**	

lecturers signature: **Head of Department signature:**