Module (Course Syllabus) Catalogue

2022-2023

College/ Institute	**Erbil Technology College**	
Department	**AITE**	
Module Name	**ELECTRICAL INSTALLATION**	
Module Code		
Degree	**Technical Diploma/Bachlor**	
Semester	**2**	
Qualification	**Ms.c**	
Scientific Title	**Assistant Lecture**	
ECTS (Credits)	**8**	
Module type	**Core**	
Weekly hours	**4**	
Weekly hours (Theory)	**(2)hr Class**	**(118) Total hrs Workload**
Weekly hours (Practical)	**(2)hr Class**	**(64) Total hrs Workload**
Number of Weeks	**12**	
Lecturer (Theory)	**Abubaker aziz ahmed**	
E-Mail & Mobile No.	*abubaker.ahmed@epu.edu.iq* **07504889179**	
Lecturer (Practical)	**Marbi waso ,Fakhraddin najmadin**	
E-Mail & Mobile No.		
Websites		

Course Book

Course Description	• This course is prepared to provide a comprehensive understanding about the main principles of Electrical installation such as power cable including conductive, insulation ,high voltage &low voltage system in addition to how to use circuit breaker and earth leakage circuit breaker in electrical circuit and type of protection for motor or any loads , Voltage drop, improving power factor theoretical and practical experience for analyzing, planning, design, and implementation of Electrical installation Engineering .
Course objectives	• Understanding the basic components of electrical structures, identification of conductors, insulators, semiconductors, medium and low voltage systems, magnetic forces, types of magnetic materials, circuit breaker systems, and how to equip the consumer with electric power with general classification of electric machines. With an introduction to how to erect electrical boards.
Student's obligation	The students should attend the theoretical lectures and study them very well to understand them and ask about any part which is not clear, also the students should have daily examinations about the previous lecture and solve the homework questions. For the practical part the students should attend in time every week to make the experiment and prepare a report about it, in addition the students should have daily exams about the previous experiment and of course there will exams at the end of each term At the end of the semester the students should have both practical and theoretical examinations. Missed classes will not be compensated including the quizzes and the scheduled assignments. The students will lose marks on unattended classes with quizzes unless a legal document or authorized leave is presented which should explain the excuse of the absence. However, the absent student should take the responsibility for making up the missed lecture. 1. Regular attendance to classes.(must not be exceed to 10%)

	2. Written tests clearly linked to learning objectives. 3. Seminar
Required Learning Materials	• **Forms of teaching** **Lecturing style in theory and laboratory in practice.** Methods of delivering the course (teaching method): The teaching method used to deliver the course material does varies, but mainly using data show (power point). Variety methods are implemented, whenever necessary, to bring about a better understanding of the electrical installation to the students. Power point slides contain a simplified notes (appropriate method which is suitable for students to understand more easily), sometimes via animations, videos, tables, diagrams and figures. Power point is a modem teaching method, that is both time and money saving. Speed teaching is less boring for student, and encouraging students to participate in the subject, via asking questions on the subject. **Means of explanation:** 1. Data show and power point 2. White board 3. Laboratory exercise model. 4. Video lessons (recorded by the lecturer), inserted in Moodle program on line

Evaluation	**Task**		**Weight (Marks)**	**Due Week**	**Relevant Learning Outcome**
	Paper Review				
	Assignments	Homework	10%		
		Class Activity	2%		
		Report			
		Seminar	14%		
		Essay			
		Project			
	Quiz		4%		
	Lab.		14%		
	Midterm Exam(P+T)		16%		
	Final Exam (P+T)		40%		
	Total		100%		

Specific learning outcome:	**Student learning outcome:** • The student learns how to connect and install houses, buildings and how to connect types of electrical lamps and learn how to providing the consumer with electric power from the main stations. • The student learns how to connect classic control circuit of industrial installation.
Course References:	▪**Key references:** i. A.J. Watkins, C. Kitcher, "Electrical Installation Calculations ", eighth edition. ii. Trevor Linsley, " Introduction To Electrical Installation Work " iii. Trevor Linsley, "Basic Electrical Installation Work", level 2, fifth edition. iv. Brian Scaddan, "Electrical Installation Work ", sixth edition. v. Trevor Linsley, "Advance Electrical Installation Work "level 3, fifth edition. ▪ **Useful references:** vi. "Basic Electricity ", CONTINUING EDUCATION PROFESSIONAL DEVELOPMENT COURSE. vii. KristoverKicher, "Practical Guide to Inspection, Testing and Certification of Electrical Installations ", third edition. viii. Step by step Guide Book on "Home Wiring ". ▪ **Students are free to use the above course books or any alternative electrical machine books of their own**

Course topics (Theory)	**Week**	**Learning Outcome**
• Students learn the vocabulary of scientific approach to material sources of textbooks. SI- Derived units. SI- Prefixes and Symbols and safety Precautions. • Types of materials according to electricity connection, Conductors, insulators and semiconductor materials. Energy band structure. • Definition of electricity, basic types of electrical energy. Colour Coding of Wires, Cable color code for Single and Three phases, Cables and Conduit, Wire Sizes. • Safety Equipment, Common Electrical Units used in Formulas and Equations and common symbols. Insulating materials examples of air insulation material oil and its uses Temperature Classes of Electrical Insulators.	1	
• Ohm's Law, Resistivity, Conductivity, Relationship between Resistivity and Conductivity, Resistance Temperature coefficient of	2	

Resistance (α), Inductive reactance (XL), Capacitive reactance (XC), Impedance.Components of a Circuit, Resistors in series and parallel. • Electricity supply systems, steps of electrical energy from the generation station until it reaches the consumer. • Protection devices used in houses and residential installations. Fuses and types of fuses. • Circuit breaker, types of circuit breaker, basic differences between fuses and circuit breaker.		
• Wiring systems, types of wiring systems, cleat wiring, wooden casing and capping wiring, C.T.S or T.R.S wiring, metal sheathed wiring, conduit wiring. • Electrical power cable, rating of power cables, construction of power cables, types of cables, classification of cables, cable rating table, difference between overhead lines and cables.	3	
• Introduction of Earthing , Earthing Type , and how reduce the value of Earthing resistance • Earthing system, applications of earthing system, earthingconductors, earthingelectrods.	4	
• Voltage drop and current rates in electrical cable	5	
• Type of earth MCB circuit breaker(current and voltage type)	6	
• Type of earth leakage circuit breaker(current and voltage type)	7	
• solution some example on	8	
• Lightning Protection Systems	9	
• Installation Conduit wiring(advantage and disadvantage of Conduit / p.v.c. steel and flexible conduit)	10	
• solution some example on Conduit wiring	11	
• Power Distribution Systems- Components of the power system- TYPE OF DISTRIBUTION SYSTEM CONNECTION	12	
Practical Topics: • The laboratory will involve experiments on the laboratory bench kits, along with the corresponding subject in the lectures. A brief outline of the experiments to be done are as follows:	**Week**	**Learning Outcome**
• One lamp controlled by one switch protect with MCB. • Series two lamp controlled by one switch. protect with MCB.	1	

• Parallel two lamp controlled by one switch. protect with MCB.		
• Two-way switch lamp control (staircase). protect with MCB • Installing and operate an electric bell from two places with a lamp indicator. protect with MCB	2	
• Two-way switch for lamp control (intermediate switch).	3	
• Connection of a single-phase power meter (KWH) to a specific load through a plat distribution. • Connection of a three-phase power meter (KWH) to a specific load through a plat distribution.	4	
• Extracting the contactor relay and implement the control circuit for DOL three phase induction motor.	5	
• Controlling the operation of a three-phase induction motor and protecting with thermal relay. And detecting lamp.	6	
• Revers direction of three phase induction motor by two contactor relay and push boton power circuit and control circuit, with detect lamp for ON, OFF state.	7	
• Operating and control of three phase induction motor in three different position, by one contactor relay and push boton power circuit and control circuit, with detect lamp for ON, OFF state.	8	
• control power circuit for DOL three phase induction motor. With protection phase falure.	9	
• Grardge Door control and power circuit	10	
• Three position electrical crane control and power circuit.	11	
• Review	12	
Questions Example Design ***1. Compositional:*** In this type of exam the questions usually starts with Explain how, What are the reasons for…?, Why…?, How….? With their typical answers Examples should be provided ***2.True or false type of exams:*** In this type of exam a short sentence about a specific subject will be provided, and then students will comment on the trueness or falseness of this particular sentence. Examples should be provided		

3. Multiple choices: In this type of exam there will be a number of phrases next or below a statement, students will match the correct phrase.Examples should be provided.		
Extra notes:		
External Evaluator This course book have been reviewed, resigned and approved by (Hussain Ali Ebrahim) former lecturer of this subject. Assistant lecture Mr. Hussain Ali Ebrahim Politecnic University AITE Dep. *Email: hussenibrahim@gmail.com* Mob No. 07501147567		