

Course Description Form

1. Course Name:					
Electrical and Electronic Engineering / 3 rd					
2. Course Code:					
MPAC311					
3. Semester / Year:					
(Annual System) (2024-2025)					
4. Description Preparation Date:					
university calendar for the year (2024-2025)					
5. Available Attendance Forms:					
Theoretical and Practical Classes					
6. Number of Credit Hours (Total) / Number of Units (Total)					
Units (Total) 90 hrs. (theoretical) + 60 hrs. (practical) /8 units					
7. Course administrator's name (mention all, if more than one name)					
Name: Asst.Prof.Dr. Muhannad Kamil Email: muhannad.k@uokerbla.edu.iq					
8. Course Objectives					
Course Objectives		<p>1- Introducing the student to the basic processes of Electrical and Electronic Engineering</p> <p>2- To study the principles of electrical machines and electronic devices necessary for refrigeration and air conditioning engineers.</p>			
9. Teaching and Learning Strategies					
Strategy	<p>1- Lectures and illustrations: Data Show</p> <p>2- Multimedia using the e-learning system</p> <p>3- Knowing the students and developing their respect</p> <p>4- Effective questioning techniques and discussion with them.</p> <p>5- Explicitly teach thinking skills & problem-solving techniques</p>				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3 theoretical + 2 practical	understand the lesson	D.C motors, construction of commutator, types of D.C motors	Theoretical & practical lectures	Quiz & Discussion
2	3 theoretical + 2 practical	understand the lesson	Back e.m.f, speed equations, speed control	Theoretical & practical lectures	Quiz & Discussion

3	3 theoretical + 2 practical	understand the lesson	Starting of D.C motor starter connection, torque of D.C motors	Theoretical & practical lectures	Quiz & Discussion
4	3 theoretical + 2 practical	understand the lesson	Speed-torque characteristics of each type of D.C motor	Theoretical & practical lectures	Quiz & Discussion
5	3 theoretical + 2 practical	understand the lesson	Examples to evaluate starting current of D.C motor with and without starter, also for speed control	Theoretical & practical lectures	Quiz & Discussion
6	3 theoretical + 2 practical	understand the lesson	Single phase induction motor, split-phase capacitor-start, shaded pole type	Theoretical & practical lectures	Quiz & Discussion
7	3 theoretical + 2 practical	understand the lesson	3-phase induction motor construction, synchronous Speed, slip.	Theoretical & practical lectures	Quiz & Discussion
8	3 theoretical + 2 practical	understand the lesson	Control of three-phase induction motor using voltage frequency control.	Theoretical & practical lectures	Quiz & Discussion
9	3 theoretical + 2 practical	understand the lesson	Starting of 3-phase induction motor, star-delta method, step down transformer	Theoretical & practical lectures	Quiz & Discussion
10	3 theoretical + 2 practical	understand the lesson	Torque characteristic, no load torque	Theoretical & practical lectures	Quiz & Discussion
11	3 theoretical + 2 practical	understand the lesson	3-phase system, star & delta connection, line current, line voltage, phase current and voltage	Theoretical & practical lectures	Quiz & Discussion
12	3 theoretical + 2 practical	understand the lesson	Instruments measurements, ammeter, voltmeter, ohmmeter, kWh meters.	Theoretical & practical lectures	Quiz & Discussion
13	3 theoretical + 2 practical	understand the lesson	Contactors, relays, timer	Theoretical & practical lectures	Quiz & Discussion
14	3 theoretical + 2 practical	understand the lesson	Thermal overload, star (contactor +timer)	Theoretical & practical lectures	Quiz & Discussion
15	3 theoretical + 2 practical	understand the lesson	Fuse, circuit breaker types, choice	Theoretical & practical lectures	Quiz & Discussion
16	3 theoretical + 2 practical	understand the lesson	Voltage drop in cables	Theoretical & practical lectures	Quiz & Discussion
17	3 theoretical + 2 practical	understand the lesson	Calculation for choice size of cable	Theoretical & practical lectures	Quiz & Discussion
18	3 theoretical + 2 practical	understand the lesson	Diode, V-I characteristics half-wave rectifier	Theoretical & practical lectures	Quiz & Discussion

19	3 theoretical + 2 practical	understand the lesson	Full-wave rectifier, bridge and center-top transformer rectifier	Theoretical & practical lectures	Quiz & Discussion
20	3 theoretical + 2 practical	understand the lesson	Transistor, construction types	Theoretical & practical lectures	Quiz & Discussion
21	3 theoretical + 2 practical	understand the lesson	Transistor biasing characteristics collector curves.	Theoretical & practical lectures	Quiz & Discussion
22	3 theoretical + 2 practical	understand the lesson	Saturation, active, breakdown region and cut-off regions	Theoretical & practical lectures	Quiz & Discussion
23	3 theoretical + 2 practical	understand the lesson	Transistor as amplifier ; Transistor as electronic switch.	Theoretical & practical lectures	Quiz & Discussion
24	3 theoretical + 2 practical	understand the lesson	Thyristor , construction characteristics , silicon controlled rectifier .	Theoretical & practical lectures	Quiz & Discussion
25	3 theoretical + 2 practical	understand the lesson	Effect of firing angle on SCR .	Theoretical & practical lectures	Quiz & Discussion
26	3 theoretical + 2 practical	understand the lesson	SCR applications.	Theoretical & practical lectures	Quiz & Discussion
27	3 theoretical + 2 practical	understand the lesson	Diac – Triac characteristics applications with SCR .	Theoretical & practical lectures	Quiz & Discussion
28	3 theoretical + 2 practical	understand the lesson	Control of A.C devices using solid – state semiconductor control choppers.(1)	Theoretical & practical lectures	Quiz & Discussion
29	3 theoretical + 2 practical	understand the lesson	Control of A.C devices using solid – state semiconductor control choppers.(2)	Theoretical & practical lectures	Quiz & Discussion
30	3 theoretical + 2 practical	understand the lesson	Operational amplifier 741	Theoretical & practical lectures	Quiz & Discussion

11. Course Evaluation

1. Discussion and questions with students
2. Attendance and homework
3. Monthly Exam.
4. Semester exam (first semester + second semester)
5. Final annual exam.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Basic Electrical And Electronics Engineering By S. K. BHATTACHARYA
Main references (sources)	Electrical Engineering, Principles & Applications By Allan Hambley
Recommended books and references (scientific journals, reports...)	Fundamentals of Electrical Engineering and Electronics Theraja, B.L.
Electronic References, Websites	https://electronics.wisc-online.com/ https://electrical-engineering-portal.com