

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Technology
2. University Department/Centre	Chemical Engineering Department
3. Course title/code	Electrical Technology/CE.133
4. Programme(s) to which it contributes	Undergraduate teaching plan
5. Modes of Attendance offered	Full time
6. Semester/Year	2 semester/year
7. Number of hours tuition (total)	2
8. Date of production/revision of this Specification	25/5/2016
9. Aims of the Course	
To introduce and develop an understanding basic of electrical technology involving lectures contains ' Basic Electrical and Engineering Principles ' which any student wishing to progress in Electrical engineering would need to know. An introduction to electrical Circuits, resistance variation, chemical effects of electricity, series And parallel circuits, capacitors and capacitance, magnetic circuits, Electromagnetism, electromagnetic induction, Transformers, Electricity generation , Transformers , electrical measuring Instruments and measurements, semiconductor diodes and transistors .	

10• Learning Outcomes, Teaching, Learning and Assessment Method

A-Knowledge and Understanding

A1. Develop a deep understanding of issues related to the Electrical technology such as :

- recognize common electrical circuit diagram symbols
- understand that electric current

understand that resistance opposes current flow and is measured in ohms

appreciate what an ammeter, a voltmeter, an ohmmeter, a multimeter and a C.R.O. measure

- introduction to DC circuit and AC circuit and Circuit analysis
- perform calculations involving capacitors connected in parallel and in series
- define dielectric strength and energy storage and practical types of capacitors. state its unit and charge and discharge of capacitors.
- the energy stored in a capacitor is given by
-

Magnetism and Electromagnetism

DC and AC generator and motor

- Semi conductor devices and amplifier
- Measuring systems

B. Subject-specific skills

- B1. Develop skill in circuit analysis and electric devices and motors
- B2. Interpret electric voltage generation and related with chemical process
- B3. Develop skill in electric symbols, units and material used in electric machine

Teaching and Learning Methods

Lectures, Tutorials, Example Classes, Informal and formal teamwork, Weekly homework problems

Assessment methods

Midterm exams, Final exam, Quizzes, Weekly homework, Team and homework problems, partial test (Oral questions :- multiple choice, alternative response), Open questions that have a definite answer, or do not have a definite answer

C. Thinking Skills

- C1. An ability to apply effective, creative and innovative solutions, both independently and cooperatively, to current and future problems.
- C2. Solve reaction engineering problems through logic.
- C3. Characterization and analyses the performance of electric circuit, motors, generator and measuring instruments.
- C4. Characterization, analyses and evaluate scientific and engineering information and identify knowledge gaps and opportunities to understand the relation between electricity and chemical engineering

Teaching and Learning Methods

Lectures, Tutorials, Example Classes, Informal and formal teamwork, Weekly homework problems, Analysis of cases linked to the work environment, Practical Applications

Assessment methods

Midterm exams, Final exam, Quizzes, Weekly homework, Team and homework problems, partial test (Oral questions :- multiple choice, alternative response), Open questions that have a definite answer, or do not have a definite answer

D. General and Transferable personal development).

Skills (other skills relevant to employability and

D1. Work together in same-discipline teams to solve problems.

D2. Speed intuitive, predictability and evaluate information and ideas in the handling of electrical technology issues

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1 st semester					
1	2	At the end of this lecture student should be able to: - state the basic SI units - recognize derived SI units - understand prefixes denoting multiplication and division - state the units of charge, force, work and power and perform Simple calculations involving these units - state the units of electrical potential, e.m.f.,	Introduction to IS units and DC circuit	Lectures, Tutorials, Example Classes,	partial test (Oral questions :- multiple choice, alternative response), solved problems and questions that have answer only
2	2	calculate unknown voltages, current and resistances in a series	Ohms law	Lectures Tutorials, Example	partial test (Oral questions :- multiple choice, alternative response), solved problems and
3	2	calculate unknown voltages, currents	Series and Parallel circuit		Oral questions, solved problems
4	2	Mesh circuit analysis and calculate unknown resistant, current and voltage	Kirchoffs law and mesh aanaanalysis	Lecture and tutorial	Oral quation and solved proplems

5	2	Apply delta and star connection	Star /Delta conversion and		
6	2	Conversion from star to delta	Star –Delta circuit	Lecture and tutorial	
7	2		Examination		
8	2	understand electrolysis and its applications, including electroplating - appreciate the purpose and construction of a simple cell - explain polarization and local action - explain corrosion and its effects	Chemical Effect of Electricity	Lecture and tutorial	
9	2	At the end of this lectures student should be able to: -describe an electrostatic field -define electric field strength E and state its unit -define capacitance and state its unit -describe a capacitor and draw the circuit diagram symbol	Capacitor and capacitance	Lecture and tutorial	
10	2	describe practical types of capacitor and understand the precautions needed when discharging capacitors	Charging and discharging capacitors	Lecture and tutorial	
11	2	describe practical types of capacitor	-practical type of capacitor	Lecture and tutorial	
12	2	describe the magnetic field around a permanent magnet	Magnetism and Electromagnetism	Lecture and tutorial	

		<ul style="list-style-type: none"> - state the laws of magnetic attraction and repulsion for two magnets in close proximity - define magnetic flux, Φ, and magnetic flux density, B, and state their units 			
13	2	Describe magnetic materials	Magnetic material	Lecture and tutorial	
14	2	<ul style="list-style-type: none"> -define permeability, distinguishing between μ_0, μ_r and - understand the B–H curves for different magnetic materials - appreciate typical values of μ_r - perform calculations involving B, D or H - define reluctance, S, and state its units 	Permeability and Faraday law	Lecture and tutorial	
15	2		Examination		
2nd semester					
16	2	Understanding the magnetic field produced by Current flow in conductor	Force on current carrying conductor	Lecture and tutorial	
17	2	Understanding the magnetic field produced by Current flow in conductor	Dynamically induced EMF	Lecture and tutorial	

18	2	Understanding the magnetic field produced by Current flow in coil	Inductance in a coil	Lecture and tutorial	
19	2	Understanding the principle of motor and generator	DC motor and AC motor	Lecture and tutorial	
20	2	Understanding generation of electricity	Generation AC voltage and current	Lecture and tutorial	
21	2	Understanding the parameters of sine wave	Frequency, period and wavelength of AC signal	Lecture and tutorial	
22	2	Understanding the phasor diagrams	Phase relationships	Lecture and tutorial	
23	2	Understanding the characterization of AC wave	Characteristic value of voltage and current	Lecture and tutorial	
24	2		Examination		
25	2	Gain the ability of solving and recognize the inductive circuit	Inductance and inductive circuit	Lecture and tutorial	
26	2	Understanding the technology of transformer and functions	Transformer	Lecture and tutorial	
27	2	Understanding three phase production and connection	Three phase circuits	Lecture and tutorial	
28	2	Understanding the semiconductor doping and application	Semiconductor devices	Lecture and tutorial	
29	2	Understanding the structure and operation of measuring instrument	Measuring instruments	Lecture and tutorial	
30	2		Examination		

12. Infrastructure

Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	<ul style="list-style-type: none"> ○ Lecturers ○ Book “John Bird, Electrical theory and Technology ,2nd Edition ,Newres,2003 ○ Other support books :- Huge “Electrical Technology“
Special requirements (include for example workshops, periodicals, IT software, websites)	Websites
Community-based facilities (include for example, guest Lectures, internship, field studies)	None

13. Admissions	
Pre-requisites	None
Minimum number of students	Central Admission
Maximum number of students	Central Admission