

Annexure I

Department: Physics

Programme: B.Sc. Chemistry/Mathematics

Semester – I		
Course Code	Course Title	Credits
21UCHID101/21UMTID101	: Electricity and modern physics	3

Course Description:

This course covers of fundamental concepts of different topics of electricity, some basics concepts of modern physics like structure of atom and wave mechanics are covering fundamental aspect of modern physics which are useful for chemistry and mathematics students

Course Purpose:

As this course is design for study of chemistry and Mathematics students as ICD subject different fundamental concepts of electricity are covered in such a way that it can be helpful to them in future study and modern physics aspect are always interdisciplinary useful topic

Course Outcomes: Upon completion of this course, the learner will be able to

CO No.	CO Statement	Blooms taxonomy Level (K ₁ to K ₆)
CO ₁	D.C.Circuits & A.C.Circuits analysis	K3
CO ₂	Network Theorems & Multimeter	K3
CO ₃	Structure of The Atom	K2
CO ₄	Wave Mechanics	K2
CO ₅	Particle accelerators and cosmic rays	K1, K3

Course Content	Hours
Module-I: D.C.Circuits & A.C.Circuits	10 hrs

<ul style="list-style-type: none"> • Growth and decay of current in L-R circuit with D.C. source • Charge and Discharge of R-C • Circuit with D.C. source • A.C.Circuits • Review of Alternating currents, Cycle, Frequency, Phase • R.M.S value of Alternating currents • L-C-R series A.C.source • L-C-R series resonance • Parallel resonance 	
Module-II: Network Theorems & Multimeter	08 hrs
<ul style="list-style-type: none"> • Constant voltage source • Constant current source • Maximum power transfer theorem • Thevenin's theorem • Norton's theorem • Multimeter 	
Module III: Structure of The Atom	08hrs
<ul style="list-style-type: none"> • Failure of Classical Mechanics , • Effect of Nuclear Motion on Atomic Spectra • Correspondence Principle , Critical Potentials • Atomic Excitation, Vector Model • Quantum numbers 	
Module IV: <i>Wave Mechanics</i>	8hrs
<ul style="list-style-type: none"> • De'Broglie wavelength & Phase velocity of De'Broglie's wave • Expression for group velocity • Group velocity of de Broglie's wave • Relation between Phase velocity & Group velocity 	
Module V: <i>Particle accelerators and cosmic rays</i>	8 hrs
<ul style="list-style-type: none"> • (a) Particle accelerators 	

<ul style="list-style-type: none"> • Introduction, Linear accelerator • Cyclotron or Lawrence cyclotron • Synchrocyclotron • (b) Cosmic rays • Discovery of cosmic rays • Latitude effect, The east west effect or the azimuth effect • The altitude effect, Primary cosmic rays • Secondary cosmic rays • Origin of cosmic rays 	
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IDC – I Practical

Physics Practical – Electricity and Mechanics

21UCHID102/21UMTID102	physics Practical	6 Hrs/Week	2 Credits
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<p>Course Description:</p> <p>The practical course includes all fundamental practical of measurement , mechanics and electricity and different circuit fabrication</p>
<p>Course Purpose:</p> <p>The course of practical is develop to make student well verge to electricity tools , circuit fabrication and measurement methodology</p>

Course Outcomes: Upon completion of this course, the learner will be able to		
CO No.	CO Statement	Blooms taxonomy Level (S₁ to S₆)
CO ₁	Basic measurement methods	S1
CO ₂	Basic circuit analysis	S1
CO ₃	Use of rotational mechanic to evaluate different parameters of solid body.	S1 & S3
CO ₄	Material properties of body	S2
CO ₅	Circuit fabrication	S2 & S3

List of Practical

- Discharge of Capacitor and RC time constant.
- Series Resonance.
- Parallel Resonance.
- Verification of Maximum power transfer theorem. (Using PCB)
- Fabrication: Designing, Mounting, Soldering, Analysing and testing of Series Resistors.
- Fabrication: Designing, Mounting, Soldering, Analysing and testing of Parallel Resistors Use of Multimeter
- Low Resistance by projection method
- Verification of Ohm's law
- Low Resistances by Potentiometer
- Error analysis(2)
- bar pendulum(2)
- Bifilar suspension(2)
- Tensional pendulum (3)
- Young's modulus by serl's method
- Possion's ratio and elastic parameter of rubber tube(3)

Text books :

- V.K.Mehta & Rohit Mehta., Principles of Electronics S.Chand Comp.
- Fundamentals Of Physics By Halliday, Resnick & Walker, Welly Publication.

Reference books :

- Modern Physics - R.Murugesan & Kiruthiga Sivaprasath, S.Chand Comp.

- . Engineering Physics - R.K.Gaur, S.L.Gupta, Dhanpat Rai Publications

Reference Book: (For Practical)

1. C.L.Arora Practical Physics, S. Chand Comp.
2. Chauhan & Singh Advanced Practical Physics. Pragati Prakashan.
3. Experimental Physics, University Granth Nirman Board, (Gujarati Medium)

Pedagogic tools:

- Chalk and Board
- Power point presentation
- Seminar
- Videos

Methods of Assessment & Tools:

Components of CIE: 30 marks (Example as below)

Sr. No.	Component	Content	Duration (if any)	Marks	Sub Total
A	Test 1	1 st 2 units	1 ^{1/2} hours	5 (Set for 30)	20
	Test 2	All 5 units	3 hours	15 (Set for 70)	
B	Assignment	2		08	10
C	Class activity			12	
Grand Total					30
Assignment		<ul style="list-style-type: none"> • Abstract and executive summary • Experimental design • Concept mapping • Student generated handbook • Essay writing etc... 			
Class activity		<ul style="list-style-type: none"> • Reaction paper • Quiz • One-minute paper • Situation based question • Application card etc.. 			

Note : Any other assessment tools or methods can be adopted as per requirement of the course.