Enclosure-I

SCHEME OF INSTRUCTION AND EXAMINATIONS

For Students Admitted from A.Y. 2016-2017 & Onwards

DSE - Allied Courses for other Programmes

Semester-I							
Course Code	**Course**	**Hrs. of Instruction/ week**	**Exam Duration (Hours)**	**Maximum Marks**			**Credits**
				CIE	**SEE**	**Total**	
Part-II							
16UCHDA01	Physics-I (For B.Sc. Chemistry)	3	3	30	70	100	3
16UMTDA01	Physics-I (For B.Sc. Mathematics)	3	3	30	70	100	3
16UCHDA02	Physics-I Practical (For B.Sc. Chemistry)	2	3	20	30	50	1
16UMTDA02	Physics-I Practical (For B.Sc. Mathematics)	2	3	20	30	50	1

Semester-II							
Course Code	**Course**	**Hrs. of Instruction/ week**	**Exam Duration (Hours)**	**Maximum Marks**			**Credits**
				CIE	**SEE**	**Total**	
Part-II							
16UCHDA03	Physics-II (For B.Sc. Chemistry)	3	3	30	70	100	3
16UMTDA03	Physics-II (For B.Sc. Mathematics)	3	3	30	70	100	3
16UCHDA04	Physics-II Practical (For B.Sc. Chemistry)	2	3	20	30	50	1
16UMTDA04	Physics-II Practical (For B.Sc. Mathematics)	2	3	20	30	50	1

Semester-III							
Course Code	**Course**	**Hrs. of Instruction/ week**	**Exam Duration (Hours)**	**Maximum Marks**			**Credits**
				CIE	**SEE**	**Total**	
Part-II							
16UMTDA05	Physics-III (For B.Sc. Mathematics)	3	3	30	70	100	3
16UICDA05	Physics-III (For B.Sc. Industrial Chemistry)	3	3	30	70	100	3
16UMTDA06	Physics-III Practical (For B.Sc. Mathematics)	2	3	20	30	50	1
16UICDA06	Physics-III Practical For B.Sc. Industrial Chemistry)	2	3	20	30	50	1

Semester-IV							
Course Code	**Course**	**Hrs. of Instruction/ week**	**Exam Duration (Hours)**	**Maximum Marks**			**Credits**
				CIE	**SEE**	**Total**	
Part-II							
16UMTDA07	Physics-IV (For B.Sc. Mathematics)	3	3	30	70	100	3
16UICDA07	Physics-IV (For B.Sc. Industrial Chemistry)	3	3	30	70	100	3
16UMTDA08	Physics-IV Practical (For B.Sc. Mathematics)	2	3	20	30	50	1
16UICDA08	Physics-IV Practical (For B.Sc. Industrial Chemistry)	2	3	20	30	50	1

Courses offered by department to UG student to other department
DSE – Allied Course

S.No	Semester	Theory		Practical		Name of the Program
		Course code	Course	Course code	Course	
1	I	16UCHDA01 / 16UMTDA01	Physics-I	16UCHDA02 / 16UMTDA02	Physics-I	B.Sc. Chemistry B.Sc. Mathematics
2	II	16UCHDA03 / 16UMTDA03	Physics-II	16UCHDA04 / 16UMTDA04	Physics-II	B.Sc. Chemistry B.Sc. Mathematics
3	III	16UMTDA05 / 16UICDA05	Physics-III	16UMTDA06 / 16UICDA06	Physics-III	B.Sc. Mathematics B.Sc. Industrial Chemistry
4	IV	16UMTDA07 / 16UICDA07	Physics-IV	16UMTDA08 / 16UICDA08	Physics-IV	B.Sc. Mathematics B.Sc. Industrial Chemistry

Semester - I

16UCHDA01 / 16UMTDA01	Physics-I	3 Hrs /week	3 Credit

Unit I : D.C. Circuits & A.C. Circuits (10 Hours)

- 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

Unit II : Network Theorems & Multimeter : (06 Hours)

- Constant voltage source
- Constant current source
- Maximum power transfer theorem
- Thevenin's theorem
- Norton's theorem
- Multimeter

Unit III : Structure of The Atom: (06 Hours)

- Failure of Classical Mechanics ,
- Effect of Nuclear Motion on Atomic Spectra
- Correspondence Principle , Critical Potentials
- Atomic Excitation, Vector Model
- Quantum numbers (only definitions)

Unit IV : Wave Mechanics: (06 Hours)

- 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

Unit V : Particle accelerators and cosmic rays (08 Hours)

(a) Particle accelerators

- 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

Text Book

1. R.Murugeshan & Kiruthiga Sivaprasath Modern Physics, S.Chand Comp. (For unit III to V)
2. R.K.Gaur, S.L.Gupta, Engineering Physics Dhanpat Rai Publications. (For unit I)
3. V.K.Mehta & Rohit Mehta., Principles of Electronics S.Chand Comp. (For unit II)

Reference Books

1. A.S. Vasudeva Modern Engineering Physics, S.Chand Company.
2. Halliday and Resnick.Physics. John Wiley.
3. Brij Lal and Subrahmaniam. Heat and Thermodynamics

16UCHDA02 / 16UMTDA02	Physics-I Practical	2 Hrs /week	1 Credit

1. Discharge of Capacitor and RC time constant.
2. Series Resonance.
3. Parallel Resonance.
4. Verification of Maximum power transfer theorem. (Using PCB)
5. Fabrication: Designing, Mounting, Soldering, Analysing and testing of Series Resistors.
6. Fabrication: Designing, Mounting, Soldering, Analysing and testing of Parallel Resistors
7. Use of Multimeter
8. Low Resistance by projection method
9. Verification of Ohm's law
10. Low Resistances by Potentiometer

Reference Book

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)

Semester - II

16UCHDA03 / 16UMTDA03	Physics-II	3 Hrs /week	3 Credits

Unit I : Semiconductor Diode: (08 Hours)

- Semiconductor diode
- Half wave rectifier
- Efficiency of half wave rectifier
- Full-wave rectifier
- Centre-tap full wave rectifier
- Full wave bridge rectifier
- Efficiency of full-wave rectifier
- Ripple factor, Comparison of rectifiers
- Filter circuits , Types of filter Circuits
- Voltage stabilization
- Zener diode
- Zener diode as voltage stabilizer

Unit II : **Waves (07 Hours)**

- Wave motion ,
- Differential equation of a wave motion
- Particle velocity and wave velocity
- Newton's formula for velocity of sound in air and velocity of sound in water
- Laplace's correction , velocity of sound in isotropic solids
- velocity of transverse waves along a stretched string
- Melde's experiment

Unit III : X-rays (06 Hours)

- Production of X-rays
- Origin of X-ray
- X-ray Spectrum, Intensity Measurement of X-rays
- Wave nature of X-ray
- Laue's Spot & Uses, Bragg's Spectrometer
- Theory of Diffraction , Bragig's Law
- Compton effect
- Properties of X-ray

Unit IV : Natural Radioactivity (08 Hours)

(a) Basic concept of radioactivity

- Radioactivity
- Natural and Artificial Radioactivity
- General Properties of Radioactive Radiation, and Radioactive Disintegration

(b) **Law of disintegration**

- Law of Radioactive Disintegration
- Decay Constant
- Half-life Period
- Average life

Unit V : Special Purpose Diodes: (07 Hours)

- Light emitting diode
- Multicolour LEDs
- Applications of LED
- Photo diode
- Photo-diode operation
- Characteristics of Photo-diode
- Applications of Photo-diode

Text Book

1. V.K.Mehta & Rohit Mehta Principles of Electronics. S.Chand Company (For Unit I and V)
2. Brij Lal and Subrahmaniam Waves and Oscillations. S.Chand comp. (For unitI I)
3. B.L. Theraja, Modern Physics, S.Chand Comp.(For unit III and IV))

16UCHDA04 / 16UMTDA04	Physics-II Practical	2 Hrs /week	1 Credit

1. Melde's Experiment 1
2. Melde's Experiment 2
3. Study of Resonator 1.
4. Study of Resonator 2
5. Characteristics of Common Emitter Transistor (Input)
6. Characteristics of Common Emitter Transistor (Output)
7. Characteristics of Photo diode
8. Fabrication: Designing, Mounting, Soldering, Analysing and testing of Series combination of capacitor
9. Fabrication: Designing, Mounting, Soldering, Analysing and testing of parallel combination of capacitor
10. P-N Junction diode characteristics, Calculate dynamic resistance

Reference Book

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)
4. B.Saraf et al-Physics through experiments Vol. I & II
5. Chattopadhyay, Rakshit & Saha Practical Physics