C. U. SHAH UNIVERSITY

B.Sc.
(PHYSICS)
SEM – VI

C. U. SHAH UNIVERSITY

WADHWAN CITY

FACULTY OF SCIENCE

Syllabi (CBCS) of Physics
WEF June 2015

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

COURSE: B.Sc.   **SEMESTER: VI**
SUBJECT NAME: Introduction to Quantum Mechanics

SUBJECT CODE: 4SC06QMC1

Teaching & Evaluation Scheme:-

Teaching hours/week				Credit	Evaluation Scheme/semester							
					Theory				Practical			Total Marks
Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal		University	
					Marks	Hrs	Marks	Hrs	Pr	TW		
4	0	0	4	4	30	1.5	70	3	--	--	--	100

Objectives:-The general purpose of this course is

•   To expose the student knowledge of Quantum Mechanics.

Prerequisites:-Fundamental knowledge of Quantum Mechanics.

Course outline:-

Sr. No.	Course Contents
1	**Formulation of the Schrödinger Equation** Brief introduction of De Broglie's Hypothesis, Concept of wave packet anduncertainty principle, **The Schrödinger Equation:** A free particle in onedimension, Generalization to three dimensions, The operator correspondenceand the Schrödinger equation for a particle subject to forces, **PhysicalInterpretation and Condition on ψ:** Normalization and probabilityinterpretation, Non-normalizable wave function and box-normalization,Conservation of probability, Expectation value and Ehrenfest's theorem,Admissibility conditions on the wave function, Related Numericals.
2	**Stationary States and Energy Spectra** Stationary States: The time independent Schrödinger wave equation, A particlein a square well potential, Bound state in a square well potential (E<0),Admissible solutions of wave equation, The energy eigenvalues-discretespectrum, The energy eigenfunctions, parity, Penetration into classicallyforbidden regions, Square well : Non-localized states (E>0), The squarepotential barrier: Quantum mechanical tunneling, Reflection at potentialbarriers and wells, The Schrödinger equation and probability for N-particlesystem, The fundamental postulates of wave mechanics.
3	**General Formalism of Wave Mechanics** The adjoint of an operator and self adjointness, The eigenvalue problem:Degeneracy, Eigenvalues and eigenfunctions of self adjoint operators, TheDirac delta function, Observables: Completeness and normalization ofeigenfunctions, Closure, Physical interpretation of eigenvalues, eigenfunctionsand expansion coefficients, Momentum eigenfunctions: wave functions inmomentum space, The uncertainty principle, States with minimum value foruncertainty product, Commuting observables; removal of degeneracy,Evolution of system with time; constants of the motion.

4	**Exactly Soluble Eigenvalue Problems** **The Simple 'Harmonic Oscillator**: The Schrödinger equation and energyeigenvalues, The energy eigenfunctions, Series solution; Asymptoticbehaviour, Orthonormality, Properties of stationary states, **AngularMomentum and Parity:** The angular momentum operators, The eigenvalueequation for L^2; Separation of variables, Admissibility conditions on solutions;eigenvalues, The eigenfunctions: Spherical harmonics, Physical interpretation, **Angular momentum in stationary states of system with sphericalsymmetry:** The rigid rotator, A particle in a central potential; the radialequation, The radial wave function, The Hydrogen Atom: Solution of theradial equation and energy levels, The Anisotropic oscillator, The Isotropicoscillator

Learning Outcomes:-After successful completion of this course, students have:

- Knowledge of Quantum Mechanics.

Books Recommended:-

1. 'A Text Book of Quantum Mechanics', **P. M. Mathews and K. Venketeshan**, *Tata McGraw Hill Publishing Company Ltd*.
2. 'Quantum Mechanics: Theory and Applications', **A. Ghatak and S. Lokanathan**, *MacMillan India Ltd*.
3. 'Quantum Mechanics', **F. Schwabl**, *Narosa Publishing House.*
4. 'Quantum Mechanics', **G. Aruldhas**, *Prentice-Hall of India.*
5. 'Introduction to Quantum Mechanics',**David J Griffiths**, 2nd Ed., *Pearson.*
6. 'Quantum Mechanics',**Leonard I. Schiff**, *McGraw Hill Book Co.*

E-Resources:-

1. www.iitk.ernet.in/wiki/index.php
2. www.physic.about.com
3. www.physic.org
4. www.Physicsclassroom.com
5. www.howstuffwork.com
6. www.colorado.edu/physics/2000
7. www.ndrs.org. physic.com
8. www.physlinc.com
9. www.fearophysic.com
10. www.hyper physics.com

Useful CD Rom for e-learning:-

1. Hyper Physics.
2. Encyclopaedia of Science (D.K. Multimedia).
3. Physics Encyclopaedia.
4. Virtual Physics Junior (Original PC CD Rom).
5. Encyclopaedia Britannica-2008.

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

COURSE: B.Sc.   **SEMESTER: VI**
SUBJECT NAME:Nuclear Physics and Particle Physics
                                              SUBJECT CODE: 4SC06NPC1

Teaching & Evaluation Scheme:-

Teaching hours/week				Credit	Evaluation Scheme/semester							
					Theory				Practical			Total Marks
Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal		University	
					Marks	Hrs	Marks	Hrs	Pr	TW		
4	0	0	4	4	30	1.5	70	3	--	--	--	100

Objectives:-The general purpose of this course is
- To expose the student knowledge of Nuclear Physics.
- To expose the student knowledge of Particle Physics.

Prerequisites:-Fundamental knowledge of Nuclear Physics and Particle Physics.

Course outline:-

Sr. No.	Course Contents
1	**Accelerators** (Construction and working of these) Synchrocyclotron, Proton Synchrotron, Alternating gradient accelerator, Betatron. **Detector of Nuclear radiations** Introduction of radiation with matter, Interaction between energetic particle and matter, Ionization Chamber, Solid state Detector, GM Counter, Scintillation Counters.
2	**Nuclear Reaction** Rutherford experiment, Q-value of Nuclear reaction, Nuclear reaction, Energy balance in Nuclear reaction, Threshold energy of Endoergic reaction, Nuclear Transmutation.
3	**Nuclear Fission and Fusion** Nuclear fission, Energy released in fission, Bohr & Wheeler's theory of fission, Chain reaction, Atom bomb, Nuclear Reactors, Nuclear fusion, Source of stellar energy, Thermonuclear reactions, Pressurized Water Reactor, Boiling Water Reactor, Fast Breeder Reactor, Fusion Reactor, Plasma Confinement.
4	**Elementary Particles** Introduction, Particles & Antiparticles, Antimatter, The fundamental interactions, Elementaryparticle Quantum numbers, Conservation laws and symmetry, Quark model.

Learning Outcomes:-After successful completion of this course, students have:
- Knowledge of Nuclear Physics.
- Knowledge of Nuclear reaction and their applications.
- Knowledge of Particle Physics.

Books Recommended:-
1. 'Electromagnetics', **B. B. Laud**, *2ndEdition, Wiley Eastern Ltd.*
2. 'Nuclear Physics - An Introduction', **S.B. Patel**, *BPB Publication*.

3. 'Introduction to Nuclear Physics', **R. K.Puri and V. K. Babar**, *Narosa Publishers*.
4. 'Fundamentals of Nuclear Physics', **JagdishVerma, R. C. Bhandari and D. R. S.Somayajulu**, *CBS Publishers & Distributers Pvt. Ltd*.
5. 'Concepts of Modern Physics', **Arthur Beiser**, *Tata McGraw Hill*.
6. 'Introduction to Nuclear Physics', **H.Enge**, *Addison Wesley Pub. Com.*
7. 'Nuclear Physics', **D. C. Tayal**, *Himalaya Publisher.*
8. 'Modern Physics', **Kenneth Krane**, *John Wiley and Sons.*
9. 'Nuclear Physics', **Irvin Kaplan**, 2nd Edition, *Addison Wesley Pub. Com*.
10. 'Nuclear Physics', **S.N.Ghoshal**, *S. Chand & Company Ltd.*

E-Resources:-
1. www.iitk.ernet.in/wiki/index.php
2. www.physic.about.com
3. www.physic.org
4. www.Physicsclassroom.com
5. www.howstuffwork.com
6. www.colorado.edu/physics/2000
7. www.ndrs.org. physic.com
8. www.physlinc.com
9. www.fearophysic.com
10. www.hyper physics.com

Useful CD Rom for e-learning:-
1. Hyper Physics.
2. Encyclopaedia of Science (D.K. Multimedia).
3. Physics Encyclopaedia.
4. Virtual Physics Junior (Original PC CD Rom).
5. Encyclopaedia Britannica-2008.

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

COURSE: B.Sc.   **SEMESTER: VI**
SUBJECT NAME:Introduction to Statistical Mechanics and Plasma Physics
                                                      SUBJECT CODE: 4SC06SMC1

Teaching & Evaluation Scheme:-

Teaching hours/week				Credit	Evaluation Scheme/semester							
					Theory				Practical			Total Marks
					Sessional Exam		University Exam		Internal		University	
Th	Tu	Pr	Total		Marks	Hrs	Marks	Hrs	Pr	TW		
4	0	0	4	4	30	1.5	70	3	--	--	--	100

Objectives:-The general purpose of this course is
- To expose the student knowledge of Statistical Mechanics.
- To expose the student knowledge of Plasma Physics.

Prerequisites:-Fundamental knowledge of Statistical Mechanicsand Plasma Physics.

Course outline:-

Sr. No.	Course Contents
1	**Fundamentals of Statistical Mechanics** Macroscopic and microscopic states, Phase space, Liouville's theorem,Fluctuations in a physical quantity. **Microcanonical Ensemble** Microcanonical distribution, Microcanonical average, Equal a prioriprobability, Additive property of entropy, Entropy of a perfect gas in aMicrocanonical ensemble, Gibbs paradox, Removal of Gibbs paradox,Thermodynamic quantities in a Microcanonical ensemble, Average energy perparticle, Specific heat at constants volume, Sackur-Tetrode formula, Nernst'sheat theorem, Related Numericals.
2	**Canonical Ensemble** Canonical distribution, Canonical average, Canonicalpartition function, Maxwell-Boltzmann distribution of velocities, Maxwell-Boltzmann distribution of absolute velocity, Most probable velocity, Meankinetic energy, Thermodynamic quantities in a canonical ensemble,Equivalence of Microcanonical and canonical ensembles. **Grand Canonical Ensemble** Grand Canonical distribution, Grand Canonical average, GrandCanonical partition function, Thermodynamic quantities in a Grand canonicalensemble, Related Numericals.
3	**Three Distributions** Maxwell-Boltzmann Distribution, Fermi-Dirac distribution, Bose-EinsteinDistribution, Entropy of the gas, Evaluation of b, Evaluation of a, Conditionfor applicability of MB distribution. **Applications of Maxwell-Boltzmann Distribution** Energy distribution function, Energy distribution law, Partitionfunction, Most probable energy, Total number of particles, Average energy,Velocity distribution function, Total number of particles, Most probablevelocity, Average velocity and Root mean square velocity, RelatedNumericals.

4	**Plasma Physics** Introduction, Interaction of Particles, Concept of Collisions, Excitation of Atoms and Molecules, Dissociation of Molecules, Ionization of Atoms and Molecules, Recombination and Photo Ionization, Excitation and Ionization by stages, Production of Plasma, Plasma Oscillations, Properties of Plasma, Plasma Radiation, Applications of Plasma.

Learning Outcomes:-After successful completion of this course, students have:
- Knowledge of Statistical Mechanics.
- Knowledge of Plasma Physics.

Books Recommended:-
1. 'Statistical Mechanics', **B.K. Agarwal and Melvin Eisner**, *Wiley Eastern*.
2. 'Fundamental of Solid State Physics', **Saxena, Gupta andSaxena**, *PragatiPrakashan*.
3. 'Fundamentals of Statistical Mechanics',**B. B. Laud,** *New Age International Publishers*.
4. 'Elementary Statistical Mechanics', **Gupta and Kumar**, *PragatiPrakashan*.
5. 'A textbook of Statistical Mechanics', **Suresh Chandra**, *CBS Publishers*.
6. 'Concepts of Modern Physics', **Arthur Beiser**, *Tata McGraw Hill*.

E-Resources:-
1. www.iitk.ernet.in/wiki/index.php
2. www.physic.about.com
3. www.physic.org
4. www.Physicsclassroom.com
5. www.howstuffwork.com
6. www.colorado.edu/physics/2000
7. www.ndrs.org. physic.com
8. www.physlinc.com
9. www.fearophysic.com
10. www.hyper physics.com

Useful CD Rom for e-learning:-
1. Hyper Physics.
2. Encyclopaedia of Science (D.K. Multimedia).
3. Physics Encyclopaedia.
4. Virtual Physics Junior (Original PC CD Rom).
5. Encyclopaedia Britannica-2008.

FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

COURSE: B.Sc.   **SEMESTER: VI**
SUBJECT NAME:Solid State Electronics   **SUBJECT CODE: 4SC06SEC1**

Teaching & Evaluation Scheme:-

Teaching hours/week				Credit	Evaluation Scheme/semester						
					Theory				Practical		Total Marks
Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal	University	
					Marks	Hrs	Marks	Hrs	Pr	TW	
4	0	0	4	4	30	1.5	70	3	--	--	--	100

Objectives:-The general purpose of this course is
- To expose the student knowledge of Switching Circuits.
- To expose the student knowledge of Thyristor and their applications.
- To expose the student knowledge of Integrated Circuits.
- To expose the student knowledge of Operational Amplifier.

Prerequisites:-Fundamental knowledge of Electronics.

Course outline:-

Sr. No.	Course Contents
1	**Solid State Switching Circuits** Switch, Mechanical switch, Electronic switches,Advantages of electronic switches, Switchingtransistors, Switching action of Transistor,Multivibrators, Types of Multivibrators, TransistorAstableMultivibrators, Transistor MonostableMultivibrators, Transistor BistableMultivibrators,Differentiating circuit, Integrating circuit, Clipping circuits, Application of Clippers, Clampingcircuits, Basic idea of a clamper.
2	**Thyristor and their applications** Introduction, Applications, Symbolic representation,Principle and operation of SCR, Two transistor analogy ofSCR, Comparison between Thyristor and Transistor,Methods of triggering a Thyristor, DIAC, TRIAC,Rectifier circuits using SCR, Solid State SwitchingCircuits using Thyristor, Choppers, Temperature Control, Illumination Control using DIAC &TRIAC, Light active Turn off Circuit using DIAC.
3	**Introduction to Electronic Communication (EC)** Importance of Communications, The Elements of a communication system,Types of EC , Electromagnetic Spectrum, Bandwidth, **AmplitudeModulation**: Amplitude Modulation Principles, Modulation Index andPercentage of Modulation, Sidebands and Frequency Domain, SingleSideband Communication, Amplitude modulators, Analog Multiplication, Non-Linear Mixing, Amplitude Modulator Circuit (with a diode), AmplitudeDemodulators(Diode detector), **Frequency Modulation:** FrequencyModulation Principles, Phase Modulation, FM versus AM, FrequencyModulators, Voltage variable capacitor, Varactor modulator.

4	**Integrated Circuits**
	Integrated Circuits, Advantages & Drawbacks of ICs, Scale of Integration, Classification of ICs byStructure, Comparison between different ICs,Classification of ICs by Function, Linear IntegratedCircuits, Digital Integrated Circuits, Monolithic ICs areMade, Fabrication of IC Components, PopularApplications of ICs,
	Operational Amplifier
	OP-AMP, OP-AMP Symbol, Ideal Operational Amplifier, OP-AMPApplications, Linear Amplifier, Adder,Subtractor, Integrator, Differentiator,Comparator.

Learning Outcomes:-After successful completion of this course, students have:

- Knowledge of Switching Circuits.
- Knowledge of Thyristor and their applications.
- Knowledge of Integrated Circuits.
- Knowledge of Operational Amplifier.

Books Recommended:-

1. 'Principles of Electronics', **V. K. Mehta and Rohit Mehta**, *S. Chand & Company Ltd*.
2. 'Industrial Electronics and Control', **S. K. Bhattacharya and S. Chatterjee**,*Tata McGraw Hill Pub*.
3. 'Basic Electronics (Solid State)',**B. L. Theraja,** *S. Chand & Company Ltd*.
4. 'Digital Electronics', **A. P. Malvino**, *McGraw Hill International Ed*.
5. 'Principal of Electronics', **A. P. Malvino**, *McGraw Hill International Ed*.
6. 'Electronic Devices & Circuits', **Allen Mottershad**, *Prentice-Hall of India Pvt. Ltd.*
7. 'Communication Electronics', **Louis E Frenzel**, *Tata McGraw Hill Pub.*

E-Resources:-

1. www.iitk.ernet.in/wiki/index.php
2. www.physic.about.com
3. www.physic.org
4. www.Physicsclassroom.com
5. www.howstuffwork.com
6. www.colorado.edu/physics/2000
7. www.ndrs.org. physic.com
8. www.physlinc.com
9. www.fearophysic.com
10. www.hyper physics.com

Useful CD Rom for e-learning:-

1. Hyper Physics.
2. Encyclopaedia of Science (D.K. Multimedia).
3. Physics Encyclopaedia.
4. Virtual Physics Junior (Original PC CD Rom).
5. Encyclopaedia Britannica-2008.

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

COURSE: B.Sc. **SEMESTER: VI**
SUBJECT NAME:Instrumentation and Sensors **SUBJECT CODE: 4SC06ISE1**

Teaching & Evaluation Scheme:-

Teaching hours/week				Credit	Evaluation Scheme/semester						
					Theory				Practical		Total Marks
Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal		University	
					Marks	Hrs	Marks	Hrs	Pr	TW		
4	0	0	4	4	30	1.5	70	3	--	--	--	100

Objectives:-The general purpose of this course is
- To expose the student knowledge of CRO and Transducer elements.
- To expose the student knowledge of Pressure measurements related transducers.
- To expose the student knowledge of Temperature measurements related transducers.
- To expose the student knowledge of Acoustic Measurement and Optical Fibre Sensors.

Prerequisites:-Fundamental knowledge of Instrumentation and Sensors.

Course outline:-

Sr. No.	Course Contents
1	**CRO and Transducer Elements** Introduction to Cathode Ray Oscilloscope, Cathode Ray Tube, Deflectionsystem in CRT, Analog Transducers, Electromechanical Type Transducer,Potentiometric resistance type, Inductive Type, Capacitive Type, Piezo-Electric Transducer, Dynamic Characteristics of Piezo-Electric Transducers,Resistance Strain Gauges, Unbounded Strain Gauge, Bonded Strain Gauge,Resistance Strain Gauge Bridges, Balanced Bridge, Unbalanced Bridge.
2	**Transducer Elements, Pressure Measurements** **Transducer Elements:** Ionization Transducers, Mechno-ElectronicTransducer, Opto-Electrical Transducer, Photo-emissive Transducer, PhotoconductiveTransducer, Photo-voltaic Transducer. **Pressure Measurements**: Introduction, Moderate Pressure Measurements,Manometers, High Pressure Measurements, Low Pressure (Vacuum)measurements, McLeod Gauge, Thermal conductivity or Pirani Gauge,Ionization Gauge, Knudsen Gauge.
3	**Temperature Measurements** Measurements of Temperature, Non-Electrical Methods, Solid RodThermometer, Bimetallic Thermometer, Electrical Methods, ElectricalResistance Thermometer, Metallic Resistance Thermometers, SemiconductorResistance Sensors, Thermoelectric Sensors, Thermoelectric materials,Radiation Methods, Total radiation pyrometer, Selective radiation pyrometer.
4	**Acoustic Measurement and Optical Fibre Sensors** Microphones, Capacitor type microphone, Piezo-electric crystal typemicrophone, Electrodynamic type microphone, Carbon microphone,Measurements of environmental air pollution parameters, Orsat apparatus forexhaust gas analysis, Gas chromatography, Non-dispersive infrared gasanalyzer, Smoke density measurements, Optical Fibre Sensors, Advantages ofOptical Fibre Sensors, Types of Optical Fibre Sensors, Biosensors, SmartSensors.

C. U. SHAH UNIVERSITY

Learning Outcomes:-After successful completion of this course, students have:

- Knowledge of CRO and Transducer elements.
- Knowledge of Pressure measurements related transducers.
- Knowledge of Temperature measurements related transducers.
- Knowledge of Acoustic Measurement and Optical Fibre Sensors.

Books Recommended:-

1. 'Instrumentation Measurement and Analysis', **B. C. Nakra and K. K. Chaudhary**, *Tata McGraw Hill Pub*.
2. 'Biomedical Instrumentation', **R. S.Khandpur**,*Tata McGraw Hill Pub*.
3. 'Basic Electronics (Solid State)', **B. L. Theraja,** *S. Chand & Company Ltd*.
4. 'Electronic Instrumentation and MeasurementTechniques', **W. D. Cooper and A. D.Helfrick**, *Prentice-Hall of India Pvt. Ltd.*

E-Resources:-

1. www.iitk.ernet.in/wiki/index.php
2. www.physic.about.com
3. www.physic.org
4. www.Physicsclassroom.com
5. www.howstuffwork.com
6. www.colorado.edu/physics/2000
7. www.ndrs.org. physic.com
8. www.physlinc.com
9. www.fearophysic.com
10. www.hyper physics.com

Useful CD Rom for e-learning:-

1. Hyper Physics.
2. Encyclopaedia of Science (D.K. Multimedia).
3. Physics Encyclopaedia.
4. Virtual Physics Junior (Original PC CD Rom).
5. Encyclopaedia Britannica-2008.

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

COURSE: B.Sc.   **SEMESTER: VI**
SUBJECT NAME:Atmospheric and Earth Science   **SUBJECT CODE: 4SC06AEE1**

Teaching & Evaluation Scheme:-

Teaching hours/week				Credit	Evaluation Scheme/semester							
					Theory				Practical			Total Marks
Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal		University	
					Marks	Hrs	Marks	Hrs	Pr	TW		
4	0	0	4	4	30	1.5	70	3	--	--	--	100

Objectives:-The general purpose of this course is
- To expose the student knowledge of Atmospheric Science.
- To expose the student knowledge of Earth Science.

Prerequisites:-Fundamental knowledge of Atmospheric and Earth Science.

Course outline:-

Sr. No.	Course Contents
1	**Introduction and Chemistry of Earth's atmosphere:** Evolution of earth's atmosphere, Nitrogen, hydrogen halogen, sulphur, carbon-containing compounds in the atmosphere, ozone and neutral chemistry, chemical and photochemical processes, Chemical and dynamical life time of atmospheric constituent. Eddy diffusion and Turbulence.
2	**Ozone in the Atmosphere:** Evolution of the ozone layer, sources and sinks of tropospheric and stratospheric ozone, chlorofluorocarbons, ozone and UV-radiations, supersonic transport.
3	**Atmospheric aerosols:** Concentration and size, sources, and transformation, Chemical composition, transport and sinks, residence times of aerosols, geographical distribution and atmospheric effects, Air Pollution: Sources of anthropogenic pollution, Emission Inventory, Atmospheric effects- smog, visibility. Measurements of Particulate matters, SOx, NOx and CO.
4	**Internal structure of Earth** The Core, Influence, chemical compositions, pressure and temperature in the earth, The Mantle, Influence, chemical compositions, pressure and temperature in the earth, The Crust, Influence, chemical compositions, pressure and temperature in the earth, The Atmosphere and Influence of the Atmosphere, Influence of the Sun and Moon, Density of the Earth, Mass of the Earth and the Sun. **Plate Tectonics** Classification of plates, Oceanic and continental plates, Movement of plates, Plate boundaries. **Earth quakes** Seismology, Seismograph, Determination of epicentre and the focus, Modern applications of Seismology, Relative numerical.

Learning Outcomes:-After successful completion of this course, students have:
- Knowledge of Atmospheric Science.
- Knowledge of Earth Science.

C. U. SHAH UNIVERSITY

Books Recommended:-

1. 'Introduction to Atmospheric Chemistry', **P.V. Hobbs**,*Cambridge Uni. Press*.
2. 'Atmospheric Chemistry and Physics: From Air Pollution to Climate Change', **John H. Seinfeld and Spyros N. Pandis**,2ndEdition, *Wiley*.
3. 'Chemistry of the Upper and Lower Atmosphere', **Barbara J. Finlayson-Pitts Jr. and James N. Pitts,***Elsevier Inc*.
4. 'Chemistry of Atmospheres', **Richard P. Wayne**,*Oxford Uni. Press*.
5. 'Basic Physical Chemistry for Atmospheric Sciences',**P.V. Hobbs**,*Cambridge Uni. Press*.
6. 'Basics of Earth Science', **D. K. Pandey**, *AnmolPublisher, New Delhi*.
7. 'Seismology and Plate Tectonics',**GubbinsDevid**, *Cambridge Uni. Press*.

E-Resources:-

1. www.iitk.ernet.in/wiki/index.php
2. www.physic.about.com
3. www.physic.org
4. www.Physicsclassroom.com
5. www.howstuffwork.com
6. www.colorado.edu/physics/2000
7. www.ndrs.org. physic.com
8. www.physlinc.com
9. www.fearophysic.com
10. www.hyper physics.com

Useful CD Rom for e-learning:-

1. Hyper Physics.
2. Encyclopaedia of Science (D.K. Multimedia).
3. Physics Encyclopaedia.
4. Virtual Physics Junior (Original PC CD Rom).
5. Encyclopaedia Britannica-2008.

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS

COURSE: B.Sc.   **SEMESTER: VI**
SUBJECT NAME: Physics Practical-VI   **SUBJECT CODE: 4SC06PHP1**

Teaching & Evaluation Scheme:-

Teaching hours/week				Credit	Evaluation Scheme/semester						
					Theory				Practical		Total Marks
					Sessional Exam		University Exam		Internal		University
Th	Tu	Pr	Total		Marks	Hrs	Marks	Hrs	Pr	TW	
0	0	6	6	3	--	--	--	--	15	15	70	100

Objectives:-The general purpose of this course is
- To expose the student knowledge of Practical related to theory.

Prerequisites:-Fundamentalknowledge of Physics Practical.

Course outline:-

Sr.No.	Course Contents
1	To calibrate the spectrometer using Edser-Butler plate.
2	Resolving power of Diffraction Grating.
3	Study of the Output Wave form Clipping and Clamping circuit.
4	Study of AstableMultivibrator.
5	Study of UJT as Relaxation Oscillator.
6	Determine the Elastic constants using Flat Spiral Spring.
7	Study of Searle's Goniometer.
8	Study of Temperature ON-OFF Controller with Thermistor.
9	Study of Lamp Dimmer Circuit using DIAC and TRIAC.
10	Frequency response of a common source FET amplifier.
11	Susceptibility of ferromagnetic substance by Quink's method (Magnetic fluid).
12	Study of OP-AMP using IC 741.(Inverter, non-inverter, adderandsubtractor).
13	Study of BistableMultivibrator.
14	Measurements of Op-Amp parameters(Input offset voltage, input offset current, CMRR, Slew rate).
15	Determination of lattice parameter from a photograph (electron diffraction ring pattern).
16	Solar cell characteristics.

- 20% of practicals may be altered or modified.

Learning Outcomes:-After successful completion of this course, students have:
- Knowledge of practical's and its application in various fields.

Books Recommended:-
1. 'B. Sc. Practical Physics', **C. L. Arora**, *S. Chand & Company Ltd*.
2. 'Advanced Practical Physics', **M. S. Chauhan & S. P. Sing**, *PragatiPrakashan*.

3. 'Experimental Physics', **University GranthNirman Board**, (Gujarati Medium).
4. 'Physics through experiments Vol. I & II', **B. Sarafetal.**, *Vikas Publishing House*.
5. 'Advanced Practical Physics', **S. L. Gupta and V. Kumar,** *PragatiPrakashan*.
6. 'An advanced course in practical Physics', **D. Chattopadhyay and P. C. Rakshit,** *New Central Book Agency Pvt. Ltd.*
7. 'Electronic Laboratory Primer', **Poorna Chandra &Sasikala,** *S. Chand & Company Ltd*.
8. 'Advanced Practical Physics for students', **B. L.Wosnop and H. T. Flint,** *Methuen and Co. Ltd*.

E-Resources:-
1. www.iitk.ernet.in/wiki/index.php
2. www.physic.about.com
3. www.physic.org
4. www.Physicsclassroom.com
5. www.howstuffwork.com
6. www.colorado.edu/physics/2000
7. www.ndrs.org. physic.com
8. www.physlinc.com
9. www.fearophysic.com
10. www.hyper physics.com

Useful CD Rom for e-learning:-
1. Hyper Physics.
2. Encyclopaedia of Science (D.K. Multimedia).
3. Physics Encyclopaedia.
4. Virtual Physics Junior (Original PC CD Rom).
5. Encyclopaedia Britannica-2008.

C. U. SHAH UNIVERSITY

FACULTY OF: - **Science**
DEPARTMENT OF: - **English**
SEMESTER: - VI   **CODE**:- 4SC06PEF1
NAME: – **Professional Etiquettes-2**

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Schemes (Hours)				Credit	Evaluation Schemes							
							Theory				Practical (Marks)			Total
											Internal		University	
		Th	Tu	Pr	To		Sessional Exam		University Exam		Pr	TW	Pr	
							Marks	Hours	Marks	Hours				
4SC06PEF1	**Professional Etiquettes-2**	1	0	2	3	2	20	1	50	2	20	10	0	100

Detail   Course Content:

Unit No.	Detailed Contents
	Section-A
1	**Interview** • Introduction • Importance • Procedure • Types • Qualities observed by the employer • Frequently asked questions • Failure factors • Practice of interview and revision of important aspects of interview
2	**Group Discussion** • Introduction • Importance • Characteristics of successful group discussion • Types **Debate** • Introduction • Difference between group discussion and debate • Importance • Assessment criterions
3	**Public Speaking** • Introduction • Difference between presentation and public speaking • Qualities of good speaker • Non verbal communication **Technical Presentation/Talk**

	• Introduction • Preparing technical presentation • Language of the presentation • Using technological aids for presentation
4	**Resume Building** • Introduction • Difference between curriculum vitae and resume • Types • Formats • Sample of resumes
5	**Official (Job) Letters** • Cover letter/job application: solicited & unsolicited • Follow-up application • Job acceptance letter • Job refusal letter • Resignation letter • Termination letter • Relieving letter
6	**Circular, Memorandum** • Objectives of circular and memorandum • Drafting circular and memorandum
7	**Technical Research Paper and Thesis/Dissertation** • Introduction to research paper, thesis and dissertation • Types of research paper • Difference between research paper and article • Elements in research paper • Writing components: language, vocabulary, punctuation, cohesion, clarity etc.
8	**Competitive Exam Guidance** • Introduction to various competitive exams conducted by government • How to crack the competitive examination-tips • Major areas for preparation • Helping tools: websites, magazines, newspapers, employment news papers
	Section-B
9	**Wings of Fire by Abdul Kalam-Propitiation & Contemplation Chapters**

References:

Sr No.	Title	Author	Publisher
1	Effective Personal Communication Skills for Public Relations	Green Andy	Kogan age Limited
2	Advanced Buisness Communication	John M. Penrose Jr., Robert W. Rasberry, Robert J. Myers	Thomason/South-Western
3	Technical Communication	D.K.Chakradev	Tech-max Publication
4	Basic Buisness Communication	Flatly and Lesikar	
5	From Sentence to Paragraph	William J. Kelly and Deborah L. Lawton	Longman
6	Technical Communication: Principles and Practice	Meenaxi Raman & Sangeeta Sharma	Oxford University Presss
7	Principles and Practice of Business Communication	Rhoda Doctor	Sheath publishers
8	Effective Technical Communication	M Ashraf Rizvi	Tata Mc Graw hill
9	Personality Development and Soft Skills	Mitra Barun	OUP
10	Resumes and Interviews	M Ashraf Rizvi	Tata Mc Graw hill
11	Business Communication	Asha Kaul	Prentice-Hall of India Ltd
12	Business Communication	Lesikar Raymond V & Pettit John D	AIIBS Publishers & Distributers
13	Hand Book of Practical Communication Skills	Chrissie Wrought	Jaico Publishing House
14	Communication Today – Understanding Creative Skills	Ray Reuben	Himalaya Publishing House
15	Managing Soft Skills for Personality Development	B.N. Ghosh	Tata Mc Graw hill
16	Wings of Fire	Abdul Kalam	University Press