



## **FACULTY OF SCIENCE**

### **DEPARTMENT OF MATHEMATICS**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Mathematics-I**

**SUBJECT CODE:4SC01MTC1**

#### **Teaching & Evaluation Scheme:-**

Teaching hours/week				Credit	Evaluation Scheme/semester								
Th	Tu	Pr	Total		Theory				Practical				Total Marks
					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 objective of this course is to learn

- The basics of the Calculus: Limits, Derivatives, Geometry.
- The definitions of matrix and types of matrices.
- Algebra of matrices.
- Methods to solve system of linear equations.
- Eigen value and Eigen vectors of matrices.
- Methods to solve differential equations

More generally, the students will improve their ability to think critically, to analyze a real problem and solve it using a wide array of mathematical tools. These skills will be highly valuable to them in whatever path they choose to follow, be it as a Mathematics major or in pursuit of a career in one of the other sciences.

#### **Prerequisites:-**

Before studying calculus, all students should have basic knowledge algebra, geometry, trigonometry, and elementary functions, determinants, matrices and differential equations of at least 10+2 level.



## Course outline:-

Sr. No.	Course Contents	Hours
1	Definitions of Limit, Continuity, Differentiability, Sandwich Theorem, Indeterminate forms: $\frac{0}{0}, \frac{\infty}{\infty}, 0 \times \infty, \infty - \infty, 0^0, \infty^0, 1^\infty$ .	05
2	Successive derivative, Higher order derivatives, $n^{\text{th}}$ derivatives of standard form. Leibnitz's theorem and its applications.	05
3	Roll's Mean Value Theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem and problems related to it.	04
4	Taylor's Theorem (Without Proof), Maclaurin's Theorem (Without Proof), Taylor's and Maclaurin's infinite series expansions, expansions of $e^x, \sin x, \cos x, (1+x)^n, \log(1+x)$ under proper conditions.	04
5	Polar coordinates in two dimensions; Relation between two points in polar coordinates, Polar equations of line, circle, Relation between polar and Cartesian coordinates, Relation between Cartesian and Spherical coordinates, Relation between Cartesian and Cylindrical coordinates	06
6	Sphere: General Equation of sphere, Plane section of a sphere, intersection of two spheres, interia of sphere and a line, Equations of a tangent plane and a normal line to a sphere.	06
7	Determinants, minors, cofactors, adjoints of matrices, inverse by determinant, properties of determinants, Cramer's rule.	04
8	Matrix, algebra of matrices, types of matrices, Adjoint of a matrix, Non Singular and singular matrices, symmetric and skew symmetric matrices, Hermitian and skew hermitian matrices, sub-matrices.	04
9	Row operations, Row Echelon & Reduced row echelon form of Matrix, Solution of system of linear equations, solving system of linear equations simultaneously, Inverting coefficient matrix, Inverse of Matrix, Rank of matrix.	05
10	Characteristic equation of a matrix and Cayley-Hamilton theorem and its use in finding inverse of matrix, eigen value and eigen vector of square matrices, eigenvalue of special type of matrices, Diagonalization of matrix.	06
11	First order and first degree differential equations: basic concepts, Homogeneous Equations, Integrating factor, Linear differential equations, Bernoulli equations, Exact differential equations.	06
12	Differential equations of the first order but not of first degree: Solvable for p, for x and for y, Clairaut's form of differential equations and Lagrange's form of differential equations.	05



## **Learning Outcomes:-**

After the successful completion of the course, students will be able to

- Calculate the derivatives of functions of several variables.
- Graphing and optimization of the functions.
- Imagine three dimensional objects virtually.
- Analyze differential equations.
- Solve first ODES.
- Solve systems of linear equations.
- Manipulate matrix algebra and determinants.
- Evaluate Eigen values and Eigen vectors.

## **Books Recommended:-**

1. 'Analytical solid Geometry', Shanti **Narayan and Mittal P.K.**, *S. Chand and Co.* New Delhi.
2. 'Differential Calculus', **Shanti Narayan**, *Shamlal charitable trust*, New Delhi.
3. 'A Textbook of Matrices', **Shanti Narayan and Mittal P.K.**, *S. Chand and Co.* New Delhi.
4. 'Higher Engineering Mathematics, Thirty-fifth edition', **B. S. Grewal**, *Khanna Publication*.
5. 'The calculus with analytic geometry', **Louis Leithod**, *Harper-Collins Pub.*
6. 'The Elements of Co-ordinate Geometry', **S. L. Loney**, *Mac Milan & Co.*
7. 'A Textbook of Analytical Geometry of three dimensions', **P. K. Jain and Khalid Ahmad**.
8. 'Elementary Treatise on Co-ordinate Geometry of three dimensions', **R. J. T. Bell**, *Mac Milan Co.*
9. 'Advanced Engineering Mathematics', **Kreyszig E.**, *New Age International Publishing Co.*
10. 'Elementary Linear Algebra', **Howard Anton and Chris Rorres**, *Wiley Pub.*

## **E-Resources:-**

1. <http://online.math.uh.edu/HoustonACT/>
2. <http://www.math.ucdavis.edu>
3. <https://en.wikipedia.org/wiki/Calculus>
4. <http://archive.org/details/calculuswithanal032985mbp>
5. [www.sosmath.com/calculus/calculus.html](http://www.sosmath.com/calculus/calculus.html)
6. [en.wikibooks.org/wiki/Calculus](http://en.wikibooks.org/wiki/Calculus)
7. <http://mathworld.wolfram.com/Calculus.html>
8. [en.wikipedia.org/wiki/Polar\\_coordinate\\_system](http://en.wikipedia.org/wiki/Polar_coordinate_system)



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9. [tutorial.math.lamar.edu/Classes/CalcII/PolarCoordinates.aspx](http://tutorial.math.lamar.edu/Classes/CalcII/PolarCoordinates.aspx)
10. [math.ucsd.edu/~wgarner/math4c/textbook/.../polar\\_coordinates.htm](http://math.ucsd.edu/~wgarner/math4c/textbook/.../polar_coordinates.htm)
11. <http://mathworld.wolfram.com/PolarCoordinates.html>
12. <http://www.wolframalpha.com/examples/Matrices.html>
13. <http://www.online.math.uh.edu>
14. <http://www.math.ucdavis.edu>
15. [https://en.wikipedia.org/wiki/Matrix\\_\(mathematics\)](https://en.wikipedia.org/wiki/Matrix_(mathematics))
16. <http://archive.org/details/calculuswithanal032985mbp>
17. [www.maths.manchester.ac.uk/kd/ma2m1/matrices.pdf](http://www.maths.manchester.ac.uk/kd/ma2m1/matrices.pdf)
18. [en.wikipedia.org/wiki/Eigenvalues\\_and\\_eigenvectors](http://en.wikipedia.org/wiki/Eigenvalues_and_eigenvectors)
19. <http://mathworld.wolfram.com/First-OrderOrdinaryDifferentialEquation.html>
20. [www.sosmath.com/diffeq/first/first.html](http://www.sosmath.com/diffeq/first/first.html)



**FACULTY OF SCIENCE**

**DEPARTMENT OF MATHEMATICS**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Mathematics Practical-I**

**SUBJECT CODE: 4SC01MTP2**

**Teaching & Evaluation Scheme:-**

Teaching hours/week				Credit	Evaluation Scheme/semester								
Th	Tu	Pr	Total		Theory				Practical				Total Marks
					Sessional Exam		University Exam		Internal		University		
					Marks	Hrs	Marks	Hrs	Pr	TW			
0	0	4	4	2	--	--	--	--	10	10	30	50	

**Objectives: -**

The objective of this course is to learn

- The basics of the Calculus: Limits, Derivatives, Curve tracing, Geometry.
- The definitions of matrix and types of matrices.
- Algebra of matrices.
- Methods to solve system of linear equations.
- Eigen value and Eigen vectors of matrices.
- Methods to solve differential equations

More generally, the students will improve their ability to think critically, to analyze a real problem and solve it using a wide array of mathematical tools. These skills will be highly valuable to them in whatever path they choose to follow, be it as a Mathematics major or in pursuit of a career in one of the other sciences.

**Prerequisites:-**

Before studying calculus, all students should have basic knowledge algebra, geometry, trigonometry, and elementary functions, determinants, matrices and differential equations of at least 10+2 level.



## Course outline:-

Sr. No.	Course Contents
1	L'Hospital's rule and exercises
2	Successive differentiation and Leibnitz's theorem
3	Taylor's and Maclaurin's Theorem, Mean value theorems
4	Sketching of Cartesian curve, Parametric curves, Polar curves and reciprocal curves
5	Differential equations of the first order and first degree
6	Orthogonal trajectories of a family of curves
7	Differential equations of the first order but not of first degree solvable for p, for y and for x
8	Systems of linear equation and Inverse of matrices
9	Eigen values, Eigen vectors and Diagonalization
10	Cayley- Hamilton's Theorem

## Learning Outcomes:-

After the successful completion of the course, students will be able to

- Calculate the derivatives of functions of several variables.
- Graphing and optimization of the functions.
- Imagine three dimensional objects virtually.
- Analyze differential equations.
- Solve first ODES.
- Solve systems of linear equations.
- Manipulate matrix algebra and determinants.
- Evaluate Eigen values and Eigen vectors.

## Books Recommended:-

1. 'Analytical solid Geometry', Shanti **Narayan and Mittal P.K.**, S. Chand and Co. New Delhi.
2. 'Differential Calculus', **Shanti Narayan**, Shamlal charitable trust, New Delhi.
3. 'A Textbook of Matrices', **Shanti Narayan and Mittal P.K.**, S. Chand and Co. New Delhi.
4. 'Higher Engineering Mathematics, Thirty-fifth edition', **B. S. Grewal**, Khanna Publication.
5. 'The calculus with analytic geometry', **Louis Leithod**, Harper-Collins Pub.
6. 'The Elements of Co-ordinate Geometry', **S. L. Loney**, Mac Milan & Co.



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7. 'A Textbook of Analytical Geometry of three dimensions', **P. K. Jain and Khalid Ahmad**.
8. 'Elementary Treatise on Co-ordinate Geometry of three dimensions', **R. J. T. Bell**, *Mac Milan Co.*
9. 'Advanced Engineering Mathematics', **Kreyszig E.**, *New Age International Publishing Co.*
10. 'Elementary Linear Algebra', **Howard Anton and Chris Rorres**, *Wiley Pub.*

### **Notes:-**

1. Problem solving skill in mathematics is an important aspect in the teaching of mathematics.
2. There would be problem solving session of SIX hours per week and they will be conducted in batches.



# C. U. SHAH UNIVERSITY

## **FACULTY OF SCIENCE**

### **DEPARTMENT OF PHYSICS**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Physics-I**

**SUBJECT CODE: 4SC01PHC1**

**Teaching & Evaluation Scheme:-**

Teaching hours/week				Credit	Evaluation Scheme/semester								
Th	Tu	Pr	Total		Theory				Practical				Total Marks
					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 objective of this course is that the students learn...

- Electricity, L-C-R circuits, Resonance.
- The law of Conservation of energy, Force and linear momentum, Centre of Mass.
- Torque and Angular momentum & Moment of Inertia.
- Gravitational Potential Self Energy, Kepler's Laws of Planetary Motion, Satellites.
- Elasticity, Young Modulus, Bulk Modulus, Modulus of Rigidity.
- The production methods of ultrasonic and its applications.
- Thevenin's theorem, Norton's theorem, maximum power transfer theorem, Multimeter.
- Temperature measurement, Thermocouple, Pyrometer, Newton's Law, Specific heat.

This subject is equally valuable in other subject of sciences.

#### **Prerequisites:-**

Before studying this paper, all students should have basic knowledge of Newton's law of motion, conservation of energy, gravitational law, electricity and elasticity of at least 10+2 level.





**Course outline:-**

Sr. No.	Course Contents	Hours
1	<b>Introduction to planetary science :</b> Universal Gravitational law, Gravitations field, Gravitational Potential and its relation with Field strength, Potential and Field Due to a Solid Sphere, Gravitational Potential Energy, Potential energy of a planet , Earth Escape Velocity, Kpler’s three Laws of Planetary Motion with their Proofs, Satellites, Time Period of Satellite, Weightlessness, Gravity, Compound Pendulum, Measurement of ‘g’ using Bar Pendulum.	08
2	<b>Temperature :</b> Heat, Temperature, Temperature Measurements, Platinum Resistance Thermometer, Thermocouple, Fery’s Total Radiation Pyrometer, Disappearing Filament Optical Pyrometer, Specific Heat, Newton’s law of cooling, Specific Heat measurement by cooling method.	05
3	<b>Sounds&amp;Ultrasonics :</b> Introduction, Classification of Sound waves, transverse and Longitudinal waves, Musical sound and noises, , Loudness & Intensity of sound, Threshold Intensity, Measurement of intensity of sound, Kundt’s tube & its applications, Doppler effect in sound and its applications. Properties of Ultrasonics, Magnetostriction effect, Piezoelectric & Inverse Piezoelectric effect, Production (Magnetostriction&Piezoelectric) methods of UltraSonicwaves, Detection of Ultrasonics, Applications of Ultrasonic waves.	06
4	<b>Force, Work, Power and their Conservation.</b> Newtonian laws of motion, Work, Power, Conservation of Force, Kinetic energy, Work-Energy Theorem, Potential energy, Conservation of energy, Restoring force and Conservative system, Conservation of linear momentum, Centre of Mass, Collision.	07
5	<b>Elasticity:</b> Introduction, Load, Stress & strain, Hooke’s Law and Stress-Strain Diagram, Concept of elasticity, Young Modulus, Bulk Modulus, Modulus of Rigidity (Shear Modulus), Poisson’s Ratio, Equivalence of Shear to Compression & extension, The Relation between $Y, K, \eta$ & $\sigma$ , Experimental (Searle’s) method measuring Young’s Modulus, Torsion Pendulum and its applications. Determination of Poisson’s ratio for rubber.	07
6	<b>Dynamics of Rigid Bodies:</b> Rotational motion, Angular Velocity, Angular Acceleration, Torque, Angular momentum, Torque-Angular momentum Relation, Moment of Inertia, Radius of Gyration, Moment of Inertia theorems, Moment of Inertia of different symmetrical shapes, Measurement of Moment of Inertia (Fly-Wheel).	06



<b>7</b>	<b>Electricity &amp; Circuits :</b> Growth and decay of current in L-R circuit with DC source, Charge and discharge of R-C circuit with DC source, Tangent Galvanometer, Alternating Cycle-Frequency-Phase, r.m.s. value of alternating current, L-C-R Series & Parallel resonance, A.C. source.	07
<b>8</b>	<b>Circuit Analysis &amp; Network Theorems:</b> Network terminology, Network analysis by mesh currents (two & three mesh network) Circuit analysis by Node-pair voltages (one & two node pair voltage method), Constant voltage source, Constant current source, Maximum power transfer Theorem, Voltage divider theorem, Thevenin's theorem, Norton's theorem, Superposition theorem, Chassis and ground, Multimeter.	08

### **Learning Outcomes:-**

After the successful completion of the course, students will be able to learn mechanics, elasticity, electricity, Modern physics, Heat and different Laws and equation of it.

### **Books Recommended:-**

1. 'Conceptual Physics', **Paul G. Hewitt**, *Pearson Publication*
2. 'Engineering Physics', **R.K.Gaur, S.L.Gupta**, *Dhanpat Rai Publication*.
3. 'Modern Physics', **R.Mrugesan & Kiruthinga Sivaprasath**, *S.Chand Comp.*
4. 'Principles of Electronics', **V.K.Mehta & Rohit Mehta**, *S. Chand Company*.
5. 'Modern Physics', **B.L. Theraja**, *S.Chand & Company Ltd.*
6. 'Modern Engineering Physics', **A.S. Vasudeva**, *S. Chand Company*.
7. 'Engineering Physics', **G.Vijayakumari**, *Vikas Publication*.
8. 'University Physics', **Sears, Zeemansky and Young**, *Narosa Publishing*.
9. 'Physics', **Halliday and Resnick**, *John Wiley*.
10. 'Oscillations, Waves, Acoustics and Optics', **R.L.Saihgale**, *S.Chand Co.*
11. 'Atomic Physics', **J.B.Rajam**, *S.Chand & Company Ltd.*
12. 'Elements of Electronics', **M.K.Bagde & S.P.Shingh**, *S.Chand & Company Ltd.*
13. 'Introduction of Solid State Physics', **C.Kittle**.
14. 'Engineering Physics', **M.N. Avadhanulu & P.G. Kshirsagar**, *S.Chand & Company Ltd.*
15. 'The Word of Science', **Paraguon**, *U.K.*
16. 'A Text Book of Quantum Mechanics', **Methue & Venktesn**.

### **E-Resources:-**

1. [www.wikipedia.org](http://www.wikipedia.org)
2. [www.physic.about.com](http://www.physic.about.com)
3. [www.physic.org](http://www.physic.org)
4. [www.Physicsclassroom.com](http://www.Physicsclassroom.com)
5. [www.howstuffwork.com](http://www.howstuffwork.com)



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6. [www.colorado.edu/physics/2000](http://www.colorado.edu/physics/2000)
7. [www.ndrs.org.physic.com](http://www.ndrs.org.physic.com)
8. [www.physlinc.com](http://www.physlinc.com)
9. [www.fearophysic.com](http://www.fearophysic.com)
10. [www.hyperphysics.com](http://www.hyperphysics.com)

### **CD Rom for e-learning:**

1. Hyper Physics.
2. Encyclopedia of Science. (D.K Multimedia)
3. Physics Encyclopedia.
4. Virtual Physics Junior. (Original PC CD Rom)



**C. U. SHAH UNIVERSITY**

**FACULTY OF SCIENCE**

**DEPARTMENT OF PHYSICS**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Physics Practical-I**

**SUBJECT CODE: 4SC01PHP2**

**Teaching & Evaluation Scheme:-**

Teaching hours/week				Credit	Evaluation Scheme/semester								
Th	Tu	Pr	Total		Theory				Practical				Total Marks
					Sessional Exam		University Exam		Internal		University		
					Marks	Hrs	Marks	Hrs	Pr	TW			
0	0	4	4	2	--	--	--	--	10	10	30	50	

**Objectives: -**

The objective of this course is that the students learn....

- The technique to find error in instruments.
- To determine 'K' and 'g' by Bar-pendulum.
- To calculate moment of inertia of flywheel, rectangle, disc.
- To calibrate thermometer and measure unknown temperature of body.
- To make series and parallel circuits and prove different theorems.

More generally, the students will improve their ability to think critically, to analyze a real problem and solve it using a practical knowledge of Physics.

**Prerequisites:-**

Before performing these practicals, students have basic knowledge of instruments which are used and also fundamental knowledge of principles related these theories.



## Course outline:-

Sr. No.	Course Contents
1	Study of errors in observation-I (Vernier Calipers).
2	Study of errors in observation-I (Micrometer Screw gauge).
3	Bar Pendulum : Determination of 'K' and 'g' .
4	Determination of "g" by simple pendulum.
5	Determination of Hook's Law.
6	Bifiller Suspension. (M.I. of rectangular body & law of perpendiculars)
7	Torsion pendulum. (Moment of Inertia of disc & Modulus of rigidity)
8	Young's Modulus of long wire by Searl's method.
9	Poisson ratio of rubber tube.
10	Experimental check up by Multi-meter.
11	Calibration of Thermometer using Thermocouple/RTD & determination of unknown temperature.
12	Discharge of Capacitor and RC time constant.
13	Series Resonance.
14	Parallel Resonance.
15	Verification of Thevenin's theorem. (using PCB)
16	Verification of Maximum power transfer theorem. (using PCB)
17	Law resistance by Projection method.
18	Moment of Inertia measurement of a Fly-wheel.
19	Newton's law of cooling and measurement of specific heat of liquid.

## Learning Outcomes:-

After the successful completion of the course, students will be able to

- Calculate the moment of inertia of different object.
- Find out unknown temperature.
- Design different circuits.
- Verify ohm's law by tangent galvanometer.
- Find specific heat of liquid.
- Calculate young's modulus of wire.
- Draw graphs related to these practical.
- Analyze differential equations.



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### **Books Recommended:-**

1. 'Practical Physics', **C.L.Arora**, *S. Chand Comp. Ltd., New Delhi.*
2. 'Advanced Practical Physics', **M.S.Chauhan&S.P.Sing**, *PragatiPracation, Meerut.*
3. 'Experimental Physics', **University GranthNirman Board**, (Gujarati Medium).
4. 'Physics through experiments Vol. I & II', **B.Sarafetlal.**
5. 'Advanced Practical Physics', **S. L. Gupta and V. Kumar**, *PragatiPrakashan, Meerut.*
6. 'An advanced course in practical Physics', **D.Chattopadhyay and P.C.Rakshit**, *New Central book agency Pvt. Ltd.*

### **E-Resources:-**

1. [www.physic.about.com](http://www.physic.about.com)
2. [www.physic.org](http://www.physic.org)
3. [www.Physicsclassroom.com](http://www.Physicsclassroom.com)
4. [www.howstuffwork.com](http://www.howstuffwork.com)
5. [www.colorado.edu/physics/2000](http://www.colorado.edu/physics/2000)
6. [www.ndrs.org.physic.com](http://www.ndrs.org.physic.com)
7. [www.physlinc.com](http://www.physlinc.com)
8. [www.fearophysic.com](http://www.fearophysic.com)
9. [www.hyperphysics.com](http://www.hyperphysics.com)



**FACULTY OF SCIENCE**

**DEPARTMENT OF CHEMISTRY**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Chemistry-I**

**SUBJECT CODE: 4SC01CHC1**

**Teaching & Evaluation Scheme:-**

Teaching hours/week				Credit	Evaluation Scheme/semester								
Th	Tu	Pr	Total		Theory				Practical				Total Marks
					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 course will help the student to understand internal (atomic and molecular) structure of compound.
- To understand the properties of different types of chemical bonding and in addition to that what are the factors which affect nature of bonding.
- To understand basic characteristic and use of.
- Principles of thermodynamics and application.

**Prerequisites:-**

- Students should have basic knowledge of chemistry up to 10+2 level.

**Course outline:-**

Sr. No.	Course Contents	Hours
1	<b>Organic Chemistry:</b> <b>Substitution and Elimination Reactions of Alkylhalides</b> <ul style="list-style-type: none"><li>▪ Definition of Substitution and Elimination reactions</li><li>▪ Types of Reactions</li><li>▪ SN<sup>1</sup>&amp; SN<sup>2</sup> Reaction Mechanism with energy diagram</li><li>▪ Substitution Reactions of alkylhalide: Reaction with Aqueous KOH or moist Ag<sub>2</sub>O, Alkoxides or dry Ag<sub>2</sub>O, NaSH or KSH, Na<sub>2</sub>S or K<sub>2</sub>S, Alcoholic KCN, AgCN, Alcoholic NH<sub>3</sub>, KNO<sub>2</sub> or AgNO<sub>2</sub></li></ul>	10



	<ul style="list-style-type: none"><li>▪ E1 &amp; E2 Reaction Mechanism</li><li>▪ Comparison of Substitution Nucleophilic &amp; Elimination mechanisms.</li></ul>	
2	<p><b>Cycloalkanes</b></p> <ul style="list-style-type: none"><li>▪ IUPAC Nomenclature of Cycloalkanes: monocyclic, bicyclic and tricyclic systems</li><li>▪ Method of Preparation of small ring Cycloalkanes by<ol style="list-style-type: none"><li>1. Fund's Method</li><li>2. Perkin Method</li><li>3. Sabatier and Sanderson's Method</li><li>4. Dieckmann's Method</li></ol></li><li>▪ Physical Properties of Cycloalkanes</li><li>▪ Chemical Properties of Cycloalkanes<ol style="list-style-type: none"><li>1. Substitution Reactions</li><li>2. Addition Reactions</li></ol></li><li>▪ Baeyer's Strain Theory</li><li>▪ Sacche-Mohr concept of Strainless rings</li><li>▪ Preparation of Large ring cycloalkanes<ol style="list-style-type: none"><li>1. Thorpe- Ziegler's method</li><li>2. Acyloin Condensation</li></ol></li></ul>	10
3	<p><b>Inorganic Chemistry:</b></p> <p><b>Periodic Properties</b></p> <ul style="list-style-type: none"><li>▪ Mendeleev's Periodic Law &amp; Modern Periodic Law</li><li>▪ Definitions of Family or Group and Period</li><li>▪ Explanation and General Trends of the following Periodic Properties<ol style="list-style-type: none"><li>1. Atomic and Ionic Radii</li><li>2. Ionization Potential or Energy</li><li>3. Electron affinity</li><li>4. Electronegativity</li></ol></li><li>▪ Pauli's method for the determination of ionic radius of isoelectronic ions and problems based on it</li></ul>	06
4	<p><b>Bonding and Shapes of Molecules</b></p> <ul style="list-style-type: none"><li>▪ Valence Bond Theory and its limitations</li><li>▪ Hybridization – Concept of hybridization<ol style="list-style-type: none"><li>1. <math>sp</math> {<math>C_2H_2</math>, <math>BeCl_2</math>}</li><li>2. <math>sp^2</math> {<math>BF_3</math>, <math>C_2H_4</math>}</li><li>3. <math>sp^3</math> {<math>CH_4</math>}</li><li>4. <math>sp^3d</math> {<math>PCl_5</math>}</li><li>5. <math>sp^3d^2</math> {<math>SF_6</math>}</li></ol></li><li>▪ Stereochemistry of inorganic molecules<ol style="list-style-type: none"><li>1. Sidgwick Powell Rule</li><li>2. VSEPR Theory</li></ol></li></ul>	06





5	<b>Properties of First Transition Metal Series</b> <ul style="list-style-type: none"><li>▪ Introduction, Electronic Configuration and definition</li><li>▪ Reversal of Energies of 3d and 4s orbitals</li><li>▪ Atomic Properties<ol style="list-style-type: none"><li>1. Atomic and Ionic Radii</li><li>2. Ionization Potential</li><li>3. Oxidation states and their stability</li></ol></li><li>▪ Magnetic Properties<ol style="list-style-type: none"><li>1. Spectral Properties</li><li>2. Nonstoichiometric</li><li>3. Interstitial Compounds</li></ol></li><li>▪ Types of Physical Properties<ol style="list-style-type: none"><li>1. Metallic</li><li>2. Crystal Structure</li><li>3. Conductivity</li><li>4. Catalytic Properties</li><li>5. Tendency of Formation of Alloys</li></ol></li></ul>	08
6	<b>Physical Chemistry:</b> <b>Thermodynamics</b> <ul style="list-style-type: none"><li>▪ Definition of thermodynamics term: system, surroundings</li><li>▪ Types of systems</li><li>▪ Intensive and extensive properties</li><li>▪ State and path functions and their differential</li><li>▪ Thermodynamic processes</li><li>▪ Concept of heat and work</li><li>▪ First Law of Thermodynamics: Statement &amp; Mathematical form</li><li>▪ Definition of internal energy and enthalpy</li><li>▪ Calculation of <math>w</math>, <math>q</math>, <math>\Delta E</math> &amp; <math>\Delta H</math> for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process</li><li>▪ Bond dissociation energy and its calculation from thermochemical data</li><li>▪ Work obtained during adiabatic and isothermal change</li><li>▪ Heat capacity: heat capacities at constant volume and pressure and their relationship <math>C_p - C_v = R</math></li><li>▪ Zeroth Law: mathematical treatment of Zeroth law and its limitation and various statements of law</li><li>▪ Joule's law-joule Thomson coefficient and inversion temperature (only definition)</li></ul>	11
7	<b>Adsorption</b> <ul style="list-style-type: none"><li>▪ Introduction</li><li>▪ Types of adsorption</li><li>▪ Uses of adsorption</li><li>▪ Langmuir adsorption isotherms at high &amp; low pressure and its limitations</li></ul>	09



	<ul style="list-style-type: none"><li>▪ Freundlich adsorption isotherms and its limitations</li></ul>	
8	<p><b>Analytical Chemistry:</b> <b>Modes of Concentration[Concentration Concept with Numerical]</b></p> <ul style="list-style-type: none"><li>▪ Preparation of Standard Solutions<ol style="list-style-type: none"><li>1. Equivalent weight of acid and base</li><li>2. Equivalent weight of acid salt</li><li>3. Equivalent weight of an ion</li></ol></li><li>▪ Molarity with numerical</li><li>▪ Normality with numerical</li><li>▪ Molality with numerical</li><li>▪ Strength of solutions</li><li>▪ % concentration w/v</li><li>▪ Weight Fraction</li><li>▪ Volume Fraction</li></ul>	10
9	<p><b>Acids and Bases</b></p> <ul style="list-style-type: none"><li>▪ Degree of hydrolysis (h)</li><li>▪ Derivation of Hydrolysis constant (kh)</li><li>▪ pH of salt of<ol style="list-style-type: none"><li>1. Strong acid-weak base</li><li>2. Strong base- weak acid</li><li>3. Weak acid-weak base</li></ol></li><li>▪ Buffers solution- Buffer capacity</li><li>▪ Mechanism of acidic and basic buffer solution</li><li>▪ Numerical – Calculation of pH of Buffer solutions</li><li>▪ Derivation of equation for pH of acidic and basic buffer solution</li></ul>	10

### Learning Outcomes:-

The students are able to:

- Analyze the acids and bases.
- Learn the basics of bonding and shapes of molecules.
- Apply thermodynamics to different types of chemical reactions.

### Books Recommended:-

#### Organic Chemistry

1. 'A Textbook of Organic Chemistry', **K.S. Tewari, N.K.Vishnoi and S.N. Mehrotra.**
2. 'Organic Chemistry' **Morrison and Boyd.**
3. 'Organic Chemistry (Volume I, II & III)', **S.M. Mukherji, S.P. Singh and R.P. Kapoor.**
4. 'Advanced Organic Chemistry', **ArunBahl and B.S.Bahl.**



5. 'Text Book of Organic Chemistry for BSc students', **B.S. Bahl**.
6. 'Organic Chemistry', **T.W. Graham Solomons and Craig B. Fryhle**.
7. 'Organic Chemistry', **I.L.Finar**.
8. 'Organic Chemistry', **Clayden**.
9. 'Fundamentals of Organic Chemistry', **Solomon, John Wiley**.
10. 'Textbook of Organic Chemistry', **P.L. Soni and H.M. Chawla**.
11. 'March's Advanced Organic Chemistry Reactions, Mechanism and Structure', **Michael B Smith and Jerry March**.
12. 'Reaction Mechanisms and Reagents in Organic Chemistry', **Gurudeep R. Chatwal**.
13. 'Advanced Organic Reaction Mechanism', **N. Tewari**.

### **Inorganic Chemistry**

1. 'Inorganic Chemistry', **James E. Huheey** (3rd Edition), **Harper International SI Edition**.
2. 'Concise Inorganic Chemistry', **J. D. Lee**, *ELBS*.
3. 'Magneto Chemistry', **Shyamal&Datta**.
4. 'Advanced Inorganic Chemistry (3rd Edition)', **FA. Cotton and G. Wilkinson**, *Wiley Eastern Pvt. Ltd.*
5. 'Valence and Molecular Structure', **Cartmell and Fowels**.
6. 'Atomic Structure and Chemical Bonding', **ManasChanda**.
7. 'Inorganic Chemistry', **SuretkeThate**.
8. 'Coordination Chemistry', **GurdeepChatwal and M.S Yadav**, *Himalaya Publishing House*.
9. 'Basic Inorganic Chemistry', **FA. Cotton and G. Wilkinson**.
10. 'Principles of Inorganic Chemistry', **B.R. Puri, L.R. Sharma & K.C Kalia**, *Vallabh Publications, Delhi*.
11. 'Modern Aspects of Inorganic Chemistry', **H.J. Emeleus and A.G. Sharpe**, *Routledge&Kegan Paul Ltd., 39 Store street, London WCIE7DD*.

### **Physical Chemistry**

1. 'Thermodynamics for Chemists', **Samuel Glasstone**.
2. 'Principles of Physical Chemistry', **Puri, Sharma, Pathania**.
3. 'A Textbook of Physical Chemistry', **P. L. Soni, O.P. Dharmarha and U.N. Dash**.
4. 'Physical Chemistry', **Dr. D. R. Pandit, A. R. Rao and Padke**.
5. 'Progressive Physical Chemistry', **Dr. Snehi**, *Merrut Publications*.
6. 'A text book of Physical Chemistry', **Samuel Glasstone**.
7. 'Elements of Physical Chemistry', **SamuelGlasstone and D lewis**.
8. 'Introduction to Electrochemistry', **S. Gladstone**.
9. 'A text book of Physical Chemistry', **B.K. Sharma**.
10. 'Emf', **B.K. Sharma**.



11. 'Introduction to Physical Chemistry', **Madan and Madan.**
12. 'Principles of Physical Chemistry', **S.HMaron and C.F Prutton.**
13. 'Advanced Physical Chemistry', **J.NGurtu.**
14. 'Physical Chemistry', **NKundu and S.K Jain.**
15. 'Physical Chemistry', **KLK Kapoor.**
16. 'Thermodynamics', **Gurudeep Raj.**
17. 'Comprehensive Physical Chemistry', **HemandSnehi.**
18. 'Elements of Physical Chemistry', **B.R Puri, L.R Sharma, M.S Pathania.**

### **Analytical Chemistry**

1. 'Instrumental Method & Chemical Analysis', **B.K. Sharma.**
2. 'Fundamental of analytical chemistry', **Skoog& West.**
3. 'Electrometric Methods of Analysis', **Browning.**
4. 'Water Analysis and Water pollution', **V.P. Kudesia.**
5. 'Analytical Chemistry', **Dick.**
6. 'Inorganic Qualitative Analysis', **Vogel and Gehani Parekh.**
7. 'Principle of Instrumental Analysis', **Skoog.**
8. 'Instrumental Method & Chemical Analysis', **ChatwalAnand.**
9. 'Book for Water Analysis', **R. K. Trivedi, V. P. Kudesia.**

### **E-Resources:-**

1. <http://library.thinkquest.org/10429/low/atomic/atomic.html>
2. <http://en.wikipedia.org/wiki/Atom>
3. <http://www.chemguide.co.uk/atoms/properties/gcse.html>
4. [http://en.wikipedia.org/wiki/Chemical\\_bond](http://en.wikipedia.org/wiki/Chemical_bond)
5. <http://www.sparknotes.com/chemistry/bonding/properties/section1.rhtml>
6. <http://hyperphysics.phy-astr.gsu.edu/hbase/chemical/bond2.html>
7. <http://www.chem1.com/acad/webtext/chembond/cb01.html>
8. [http://en.wikipedia.org/wiki/Nuclear\\_chemistry](http://en.wikipedia.org/wiki/Nuclear_chemistry)
9. [http://www.chem.duke.edu/~jds/cruise\\_chem/nuclear/nuclear.html](http://www.chem.duke.edu/~jds/cruise_chem/nuclear/nuclear.html)
10. <http://library.thinkquest.org/10429/low/nuclear/nuclear.htm>
11. [http://www.visionlearning.com/library/module\\_viewer.php?mid=59](http://www.visionlearning.com/library/module_viewer.php?mid=59)
12. [http://en.wikipedia.org/wiki/Chemical\\_thermodynamics](http://en.wikipedia.org/wiki/Chemical_thermodynamics)
13. <http://www.shodor.org/unchem/advanced/thermo/>
14. <http://www.chem.arizona.edu/~salzmanr/480a/480ants/chemther.html>
15. [http://en.wikipedia.org/wiki/Laws\\_of\\_thermodynamics](http://en.wikipedia.org/wiki/Laws_of_thermodynamics)



**FACULTY OF SCIENCE**

**DEPARTMENT OF CHEMISTRY**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Chemistry Practical-I**

**SUBJECT CODE: 4SC01CHP1**

**Teaching & Evaluation Scheme:-**

Teaching hours/week				Credit	Evaluation Scheme/semester								
Th	Tu	Pr	Total		Theory				Practical				Total Marks
					Sessional Exam		University Exam		Internal		University		
					Marks	Hrs	Marks	Hrs	Pr	TW			
0	0	6	6	3	--	--	--	--	10	10	30	50	

**Course outline:-**

Sr. No.	Course Contents
1	<b>Organic Qualitative Analysis</b> [15 Mono functional Compounds] Compounds containing one functional group such as phenolic, carboxylic acid, ester, amide, nitro, amine, aldehyde, ketone, alcohol, halogen, anilides, carbohydrate and hydrocarbon.
2	<b>Volumetric Analysis</b> <ol style="list-style-type: none"><li>To prepare solution of acids and bases with definite concentration</li><li>To prepare a solution by dissolving 'x' gms <math>\text{NaHCO}_3</math> / <math>\text{Na}_2\text{CO}_3</math> in 100 ml solution and determine its concentration in terms of normality and molarity using the given 0.1 M HCl solution</li><li>To determine the normality, molarity and gms/litre of <b>NaOH and HCl</b> using 0.05M <math>\text{Na}_2\text{CO}_3</math> solution</li><li>To determine the molarity, g/litre and normality of each component in a given mixture of <b>NaHCO<sub>3</sub> and Na<sub>2</sub>CO<sub>3</sub></b> the using 0.1 M HCl solution</li><li>To determine the molarity, g/litre and normality of each component in a mixture of <b>H<sub>2</sub>C<sub>2</sub>O<sub>4</sub>.2H<sub>2</sub>O and H<sub>2</sub>SO<sub>4</sub></b> using 0.02 M <math>\text{KMnO}_4</math> and 0.1 M NaOH solution</li><li>To determine the molarity, g/litre and normality of each component in a mixture of <b>H<sub>2</sub>C<sub>2</sub>O<sub>4</sub>.2H<sub>2</sub>O and K<sub>2</sub>C<sub>2</sub>O<sub>4</sub>.H<sub>2</sub>O</b> using 0.1 M NaOH and 0.02 M <math>\text{KMnO}_4</math> solution</li><li>To determine the molarity, g/litre and normality of <b>KMnO<sub>4</sub> and FeSO<sub>4</sub>.7H<sub>2</sub>O</b> solution using 0.05 M <math>\text{H}_2\text{C}_2\text{O}_4.2\text{H}_2\text{O}</math> solution</li></ol>



<b>3</b>	<b>Demonstrative practicals:</b> <ul style="list-style-type: none"><li>• <b>Calibration of Glassware</b> (Burette &amp; Pipette)</li><li>• <b>Crystallization of Organic compounds</b> (3-4 compounds)</li><li>• <b>Calibration of Thermometer</b></li></ul>
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**FACULTY OF SCIENCE**

**DEPARTMENT OF BOTANY**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Botany-I**

**SUBJECT CODE: 4SC01BOC1**

**Teaching & Evaluation Scheme:-**

Teaching hours/week				Credit	Evaluation Scheme/semester								
Th	Tu	Pr	Total		Theory				Practical				Total Marks
					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 course will help the student to understand different morphological characters of plant parts.
- To understand basic aspects related to floral formula, floral diagram and plant family.

**Prerequisites:-**

Students should have basic knowledge of plant biology of 10 +2 level.

**Course outline:-**

Sr. No.	Course Contents	Hours
1	<b>SYSTEMATIC BOTANY:</b> Principles of taxonomy, merits and demerits of systems of classification of Bentham and Hooker, Engler and Prantle, Herbarium techniques: Plant collection and preparation of Herbarium Role of Herbaria and Botanical Gardens	7
2	<b>Diversity &amp; Classification of Plant Kingdom.</b> Classification of Kingdom (Five and Seven Kingdom Concept), Origin, Evolution & Phylogeny of land plants, Diversity of land plants, Fossils.	8



<b>3</b>	<b>Root and Stem</b> Definition, parts and modification.	3
<b>4</b>	<b>Leaf</b> Parts of Leaf, Types of leaf, Stipules, Leaf shape, margin, base, apex and venation. Phyllotaxy: Definition and Types with examples. Aestivation: Definition and types with examples.	5
<b>5</b>	<b>Flowers</b> Definition, study of function and types of Calyx, Corolla, Perianth, Androceium and Gynoecium. Bracts and Inflorescence: Bracts – Scaly, Involucral, Foliaceous, Petaloid and Spathe. Inflorescence: Definition and Types: Racemose and Cymose. Placentation: Definition and Types with examples.	6
<b>5</b>	<b>Fruit and Seed</b> Definition, study of function and types of fruits and seeds.	2
<b>6</b>	<b>Root and Stem</b> Definition, parts and modification.	3
<b>7</b>	<b>Family :</b> DICOTYLEDONS: Polypetalae: Menispermaceae, Capparidaceae, Sterculiaceae. Gamopetalae: Asclepiadaceae, Boraginaceae, Bignoniaceae. MONOCOTYLEDONS: Commelinaceae, Cyperaceae.	8
<b>8</b>	<b>Plant Physiology</b> Photosynthetic pigment, Photosynthesis, Calvin's cycle, C <sub>4</sub> and CAMS cycle, Photorespiration.	10
<b>9</b>	<b>Types of plant cell and tissues</b> Definition and types :Stomata ,Vein,Trichomes , Stele ,Vascular bundle, Ergastic matters, Starch grain, Aleurone grains, Raphides, Sphaerephides, Cystolith.	5
<b>10</b>	<b>Plant Resources, Management and utilization</b> Introduction, natural resources, biological resources, plant as natural resources, Bioenergy, food, fodder, fibre, medicine and essences	6

**Learning Outcomes:-**

The students are expected to

- Identification of different plant parts.
- Familiar with floral formula, floral diagram and identify family

**Books Recommended:-**





## **C. U. SHAH UNIVERSITY**

1. 'Botany', **A.C. Dutta**.
2. 'Collage Botany Vol. I & II Das', **Dutta, Gangulee and Kar**, *New Central Book Agency*
3. 'Plant Systematics - Theory and Practice', **Singh, G.**, *Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi*.
4. 'Advanced Plant Taxonomy', **A. K. Mondal**, *New Central Book Agency (P) Ltd.*
5. 'Plant Physiology', **S. Mukherji and A. K. Ghosh**, *New Central Book Agency(P) Ltd.*
6. 'Plant Physiology', **S.N. Pandey and B.K. Sinha**, *Vikas Publishing House.*
7. 'Plant Physiology and Biochemistry', **S.K. Verma**, *S. Chand & Co.*
8. 'Economic Botany', **V. Verma**
9. 'Economic Botany of the Tropics', **S. L. Kochhar**.
10. 'Economic Botany', **A.F. Hill & O. P. Sharma**, *Tata McGraw Hill, New Delhi*.
11. 'Gardening in India', **Percy Lancaster**, *Oxford & IBH Publishing Co. Pvt. Ltd.*
12. 'Gardens', **Laeef Futehally**, *National Book Trust, India.*
13. 'Economic Botany', **A.V.S.S. Samba Murty and N.S. Subramanyam**, *Wiley Eastern.*

### **E-Resources:-**

1. [en.wikipedia.org/wiki/Plant\\_morphology](http://en.wikipedia.org/wiki/Plant_morphology)
2. [en.wikipedia.org/wiki/Category:Plant\\_morphology](http://en.wikipedia.org/wiki/Category:Plant_morphology)
3. [en.wikibooks.org/wiki/Botany/Plant\\_morphology](http://en.wikibooks.org/wiki/Botany/Plant_morphology)
4. [www.botany.org/plantimages/plantmorphology.php](http://www.botany.org/plantimages/plantmorphology.php)
5. [en.wikipedia.org/wiki/Plant\\_anatomy](http://en.wikipedia.org/wiki/Plant_anatomy)
6. [www.hobbtonffa.org/.../Plant%20Anatomy%20&%20Physiology.ppt](http://www.hobbtonffa.org/.../Plant%20Anatomy%20&%20Physiology.ppt)
7. [books.google.com/books/about/Plant\\_Anatomy\\_And\\_Physiology.html](http://books.google.com/books/about/Plant_Anatomy_And_Physiology.html)



**FACULTY OF SCIENCE**

**DEPARTMENT OF BOTANY**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Botany Practical –I**

**SUBJECT CODE: 4SC01BOP2**

**Teaching & Evaluation Scheme:-**

Teaching hours/week				Credit	Evaluation Scheme/semester								
Th	Tu	Pr	Total		Theory				Practical				Total Marks
					Sessional Exam		University Exam		Internal		University		
					Marks	Hrs	Marks	Hrs	Pr	TW			
0	0	4	4	2	--	--	--	--	10	10	30	50	

**Objectives:-**

- The course will help the student to understand the plant cell and plant tissues.
- To assist students with basic knowledge of plant resource management and nursery management.
- To understand characteristic and application of plant physiology.

**Prerequisites:-**

- Students should have basic knowledge of plant biology.

**Course outline:-**

Sr. No.	Course Contents
1	Morphological study of different plant part - Leaf
2	Morphological study of different plant part - Stem
3	Morphological study of different plant part - Root
4	Morphological study of Inflorescence
5	Morphological study of Phyllotaxy
6	Morphological study of different plant part - Flower
7	Morphological study of different plant part - Androecium
8	Morphological study of different plant part - Gynoecium
9	To understand the symbol for floral formula and floral diagram
10	Family Study of Menispermaceae, Capparidaceae, Sterculiaceae, (floral



	formula and floral diagram)
11	Family Study of Asclepiadaceae, Boraginaceae, Bignoniaceae(floral formula and floral diagram)
12	Family Study of Commelinaceae, CyperaceaeCfloral formula and floral diagram)
13	Preparation of Herbarium Sheet
14	To study morphology and microscopy of Monocot Leaf
15	To study morphology and microscopy of Dicot Leaf
16	To study morphology and microscopy of Monocot Stem
17	To study morphology and microscopy of Dicot Stem
18	To study morphology and microscopy of Monocot Root
19	To study morphology and microscopy of Dicot Root
20	Stele: Study of stele from permanent slides: (i) Actinostele. (ii) Plectostele. (iii) Amphiphloicsiphonostele. (iv) Eustele. (v) Atactostele.
21	Study of various types of Vascular bundles from Permanent slides. (i) Radial (ii) Amphicribal (Hadrocentric) (iii) Collateral and open (iv) Collateral and closed (v) Bicollateral
22	Study of Non living cell contents Starch grains: Potato tuber
23	Study of Non living cell contents Aleurone grains: Castor seed.



# C. U. SHAH UNIVERSITY

## **FACULTY OF SCIENCE**

### **DEPARTMENT OF ENGLISH**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Functional English-I**

**SUBJECT CODE: 4SC01FEN1**

#### **Teaching & Evaluation Scheme:-**

Teaching Scheme (Hours)				Credit	Evaluation Scheme								
Th	Tu	Pr	Total		Theory					Practical (Marks)			Total
					Sessional Exam		University Exam		Total	Pr/Viva	TW	Total	
					Marks	Hrs	Marks	Hrs					
2	0	2	4	3	30	1.5	70	3	100	30	20	50	150

#### **Objectives:**

- To train students in/for basic fundamentals skills of Communication – LSRW in English
- To provide them the value education for better society
- To make them able to communicate well in the Professional world

#### **Prerequisites:**

- Students should have basic knowledge of English Language and grammar.
- Students should have ability to speak and write correct sentences in their day to day language.
- Students should be familiar with correct usage of language.

#### **Course outline:**

Sr. No.	Course Content (Title of the Unit)	Minimum Number of Hours
	<b>Part-A</b>	
0	Prerequisites	02
1	Basic Concepts of Grammar – Parts of Speech	06
2	Determiners	04
3	Basic Sentence Pattern in English	01
4	Modal Auxiliaries	04



5	Tenses	06
6	Reading Skill	04
7	Speaking Skill	08
8	Listening Skill	04
9	Leave Report Writing	03
	<b>Part-B Literature</b>	
10	Prose	18

Total Hours (Theory): 30 Total Hours (Lab) : 30 Total Hours : 60

**Detail Course Content of different above mention topics:**

Unit No.	Content In details including Its Sub Topics
<b>1</b>	<b>Part-A LSRW Skills</b> <b>Basic Concepts of Grammar – Parts Of Speech</b>
	<ul style="list-style-type: none"> <li>• Noun</li> <li>• Pronoun</li> <li>• Verb</li> <li>• Adverb</li> <li>• Adjective</li> <li>• Preposition</li> <li>• Conjunction</li> <li>• Interjection</li> </ul>
<b>2</b>	<b>Determiners</b>
	Articles : A, An, The Indefinite Pronouns
<b>3</b>	<b>Basic Sentence Pattern in English Language</b>
<b>4</b>	<b>Modal Auxiliaries</b>
	Simple Auxiliaries: Be, Do, Have, Modals: Shall, Will, Should, Would, Can, Could, May, Might, Must, Ought to, Need, Dare to, Used to
<b>5</b>	<b>Tenses</b>
	<ul style="list-style-type: none"> <li>• Simple Present, Simple Past, Simple Future, Present Continuous, Past Continuous, Future Continuous, Present Perfect, Past Perfect, Future Perfect, Present Perfect Continuous</li> </ul>
<b>6</b>	<b>Listening Skill</b>
	<ul style="list-style-type: none"> <li>• Students will watch and listen selected videos and after that either they will discuss what about the watched video and can be asked question on the basis of videos</li> <li>• Video based teaching ( Educational Movies will be shown to the students during the semester)</li> </ul>
<b>7</b>	<b>Speaking Skill</b>
	Students will speak on the following situations: Talking about Present, Past & Future, Meeting & Greeting People, Talking about Time, Describe the things around you



<b>8</b>	<b>Reading Skill</b> Selected text will be read and various aspects of the texts will be discussed on the basis of students' understanding.
<b>9</b>	<b>Writing Skill</b> Leave Report writing
	<b>Part-B Literature</b>
<b>10</b>	Selected Stories from "Wise and Otherwise" by Sudha Murthy 1) A Lesson in Life from a Beggar 2) Death without Grief 3) Idealists at Twenty Realists at Forty 4) Think Positive, Be Happy 5) Crisis of Confidence 6) Sorry, The line is Busy 7) Oh Teacher, I Salute Thee 8) Life is an Examination

**Resources:**

- Wise and Otherwise, Sudha Murthy, Penguin Books India Pvt. Ltd. Delhi
- An Intermediate English Grammar, Raymond Murphy, Cambridge University Press
- A High School English Grammar, Wren & Martin, S. Chand Publication

**Reference Reading:**

Note: To develop the LSRW skills of the students, it is suggested the following texts should be read as reference books.

- Tagore Rabindranath, Selected Short Stories of Tagore
- Short Stories of R. K. Narayana
- Small articles from daily newspaper: The Indian Express & The Times of India
- Readers Digest, an English Magazine



**C. U. SHAH UNIVERSITY**

## **FACULTY OF SCIENCE**

### **DEPARTMENT OF ENVIRONMENTAL SCIENCE**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Environmental Science**

**SUBJECT CODE: 4SC01ESE1**

#### **Teaching & Evaluation Scheme:-**

Teaching hours/week				Credit	Evaluation Scheme/semester								
Th	Tu	Pr	Total		Theory				Practical				Total Marks
					Sessional Exam		University Exam		Internal		University		
					Marks	Hrs	Marks	Hrs	Pr	TW			
2	0	0	2	2	30	1.5	70	3	--	--	--	100	

#### **Objectives: -**

The primary objective of this course is to make people aware of the importance of environment on health of every individual and the society as a whole.

#### **Prerequisites:-**

Basic understanding of concepts related to environment and awareness about the harmful effects of pollution are required to understand the concept better.



**Course outline:-**

<b>Sr. No.</b>	<b>Course Contents</b>	<b>Hours</b>
<b>1</b>	<b>Introduction to Environment, Ecology and Ecosystem:</b> Definition, scope and importance Need for public awareness. Definition and Inter-relationships amongst and between them Components of Environment, Relationship between different components Man-Environment relationship Impact of Technology on the environment Environmental Degradation:	05
<b>2</b>	<b>Ecology &amp; Ecosystems</b> Introduction: Ecology- Objectives and Classification Concepts of an ecosystem- structure & function of ecosystem Components of ecosystem- Producers, Consumers, Decomposers Bio-Geo- Chemical Cycles- Hydrological Cycle, carbon cycle, Oxygen Cycle, Nitrogen Cycle, Sulfur Cycle Energy Flow in Ecosystem Food Chains: Grazing, Detritus, & Food webs Ecological Pyramids Major Ecosystems: Forest Ecosystem, Grassland Ecosystem, Desert Ecosystem, Aquatic Ecosystem, Estuarine Ecosystem	05
<b>3</b>	<b>Natural Resources</b> Renewable & Non-renewable Resources: Renewable Resources, Non-renewable Resources, Destruction versus Conservation. <b>Water Resources:</b> Water Resources-Indian Scenario, Water Sources- Surface & Ground Water Sources, Uses & overuses of water resources, problems due to Overexploitation of Water Resources <b>Forest Resources :</b> Forest Resources - Indian Scenario , Importance of forests- Ecologically & Economically, Uses of forest products, Forest Types, Deforestations-Causes and effects, Forest Degradation in India <b>Energy Resources :</b> Energy Resources - Indian Scenario , Conventional Energy Sources & its problems, non-conventional energy sources- Advantages & its limitations , Problems due to Overexploitation of Energy Resources.	10





## **C. U. SHAH UNIVERSITY**

<b>4</b>	<b>Environmental Pollution</b> Types of Environmental Pollution <b>Water Pollution:</b> Introduction – Water Quality Standards, Sources of Water Pollution, Classification of water pollutants, Effects of water pollutants, Eutrophication. <b>Air Pollution :</b> Composition of air , Structure of atmosphere, Ambient Air Quality Standards, Classification of air pollutants, Sources of common air pollutants like SPM, SO <sub>2</sub> , NO <sub>x</sub> <b>Land &amp; Noise Pollution:</b> Introduction- Lithosphere, Land Uses, Causes of land Degradation, Sources of Noise Pollution, and Effects of noise pollution Current Environmental Global Issues: Global Warming & Green Houses Effects, Acid Rain, Depletion of Ozone Layer.	06
<b>5</b>	<b>Conservation of Environment</b> The concepts of conservation and sustainable development, why to conserve, aims and objectives of conservation, policies of conservation, conservation of life support systems – soil, water, air, wildlife, forests.	04

### **Learning Outcomes:-**

- The course provides knowledge regarding conservation of environment which is very crucial in the present day scenario.

### **Books Recommended:**

1. 'Introduction to Environmental Engineering and Science', **Masters, G.M.**, Prentice –Hall of India Pvt. Ltd.
2. 'Environmental Science', **Nebel, B.J.**, Prentice –Hall Inc.
3. 'Ecology: The Link between the natural and social sciences', **Odum, E.P.**, IBH Publishing Com., Delhi.
4. 'Environmental Studies', **Snehal Popli**, Mahajan Publication.
5. 'Environmental Studies', **R. Rajagopalan**, Oxford University Press.
6. 'Environmental Pollution: Causes, Effects & Control', **K.C. Agrawal**.

### **E-Resources:**

1. [en.wikipedia.org/wiki/Environmental\\_science](http://en.wikipedia.org/wiki/Environmental_science)
2. [www.iisc.ernet.in/ug/environmentscience.htm](http://www.iisc.ernet.in/ug/environmentscience.htm)
3. [www.sciencedaily.com/gallery/earth\\_climate/environmental\\_science/](http://www.sciencedaily.com/gallery/earth_climate/environmental_science/)
4. [environment.nationalgeographic.co.in/](http://environment.nationalgeographic.co.in/)



**FACULTY OF SCIENCE**

**DEPARTMENT OF ENGLISH**

**COURSE: B.Sc.**

**SEMESTER: I**

**SUBJECT NAME: Value Education**

**SUBJECT CODE: 4SC01VEE1**

**Teaching & Evaluation Scheme:-**

Teaching hours/week				Credit	Evaluation Scheme/semester								
Th	Tu	Pr	Total		Theory				Practical				Total Marks
					Sessional Exam		University Exam		Internal		University		
					Marks	Hrs	Marks	Hrs	Pr	TW			
2	0	0	2	2	30	1.5	70	3	--	--	--	100	

**Objectives: -**

- The objective of this subject is to ful-fill Basic Human Aspirations and Harmony Existence.

**Prerequisites:-**Basic knowledge of English language.

**Course outline:-**

Sr. No.	Course Contents	Hours
1	How to be a better person and manager, Interpersonal relationship - how to co-exists with family and colleagues, Teamwork that facilitate productivity and interpersonal relations, Conflict with people in the Family and work place and its management.	5
2	Social Issues – Corruption, Cyber Crime, AIDS Awareness, and Substance abuse concept, source, consequences and remedy, Impact of Mass Media. Professional Ethics – Ethics and Values for person in the work place. Seven Habits for being an Effective Professional – Be proactive, Begin with the end in mind, Put first things first , Think win – win, Seek first to understand than to be understood, Synergize, Sharpen the saw.	5
3	Professionals with Social Responsibility – Poverty, Unemployment, Dowry system Out of Box Thinking –Daring to Dream Different and Accomplish it. Meaning of value education. Meaning of value. Meaning of education. Three Guna’s, Nature of value. Kinds of value. List of values.	5



<b>4</b>	<b>Understanding value education:</b> 1. Self-exploration as the Process for value education. 2. The Basic Human Aspirations –Continuous Happiness and Prosperity.	<b>5</b>
<b>5</b>	<b>Understanding The Harmony At Various Levels:</b> 1. Understanding in the Human being as Co-existence of Self („I") and Body 2. Harmony in the Self („I") -Understanding Myself 3. Harmony with the Body 4. Harmony with the family 5. Harmony in the Society 6. Harmony in Nature	<b>5</b>
<b>6</b>	<b>Implications of the Right Understanding:</b> 1. Providing the Basis for Universal Human Values and Ethical Human Conduct. 2. Professional Ethics in the Light of Right Understanding Historical /Ideological Basis of Education in India.	<b>5</b>

### **Learning Outcomes:-**

- It increases Professional Ethics in the Light of Right Understanding.

### **Books Recommended:-**

1. 'Born To Fly', **Dhinakaran Paul**, G.L.B. Ernest publishers, Chennai, (1997).
2. 'How to Win Over Depression', **LaHaye Tim, Zondervan, Grand Rapids, MI, USA**, (1984).
3. 'Leadership', **C. Maxwell John**, Riveroak Publishing, United States, (2001).
4. 'Living With Honour', **Khera Shiv**, Mac Millan India Limited, New Delhi, (2003).
5. 'Power of Leadership', **Maxwell John**, USA: River Oak Publishing, (2001).
6. 'Practical ways to a Powerful Personality', **Weinberg George**, Orient Paperbacks, USA, (2002).
7. 'Resource for Value Education', **New Delhi: Institute of Value Education Mani Jacob, ed.**, (2002).
8. 'Seven Habits of Highly Effective People', **Covey Stephen**, Free Press, United States, (1989).
9. 'The Power to be Your Best', **Duncan Todd**, Magna publishers limited, Mumbai, (2001).
10. 'You Can Win', **Khera Shiv**, New Delhi: Mac Millan India Limited (1988).
11. 'A foundation course in Human Values and professional Ethics', **R. R. Gaur, R. Singhal and G.P. Bagaria**, Excel Books, (2010).

### **E-Resources:-**

1. [en.wikipedia.org/wiki/Values\\_education](http://en.wikipedia.org/wiki/Values_education)
2. <https://groups.google.com/forum/#!forum/nrcvee>
3. [http://www.valueseducation.edu.au/values/val\\_about\\_resources,8768.html](http://www.valueseducation.edu.au/values/val_about_resources,8768.html)
4. <http://www.values-education.com/resources.php>