C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF MATHEMATICS

COURSE: B.Sc.   **SEMESTER: II**
SUBJECT NAME: Mathematics-II   **SUBJECT CODE: 4SC02MTC1**

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 objective of this course is
- To learn Cones, Cylinders.
- To learn Conicoids and Cartesian co-ordinate.
- To learn higher order linear differential equations.
- To learn Sequence and reduction formula.
- To learn algebra of a complex number.
- To calculate the roots of any complex number.
- To learn Complex functions.

Prerequisites:-
Students must be familiar with the properties of functions, the algebra of functions, and the graphs of functions. Students should have basic knowledge differential equations. Also they should have basic knowledge of complex numbers of at least 10+2 level.

Course outline:-

Sr. No.	Course Contents	Hours
1	Definition of a cone, vertex, guiding curve and generators; equations Cones, enveloping cone of a sphere; conditions for a cone to have three mutually perpendicular generators; tangent lines and plane at point. Condition for tangency (statement only), reciprocal cones, intersection of two cones with a common vertex.	07
2	Definition of a cylinder, its equations; enveloping cylinder of a sphere; the right circular cylinder and its equation.	05
3	Conicoids, ellipsoid, hyperboloids of one and two sheets types. Types of Conicoids and their properties.	05
4	Linear differential equations of higher order with constant coefficients, Operator D, auxiliary equation, roots of auxiliary equations, Methods to obtain Complementary Function (C.F.), solutions of Homogeneous differential equations $f(D)y = 0$ for real and complex roots.	04
5	Operator $\frac{1}{D}$, Solutions of differential equations of the types $f(D)y = X$. Methods to obtain Particular Integral (P.I.) when $X = e^{ax}$, $X = \sin(ax + b)$, $X = \cos(ax + b)$, $X = x^m$, $X = e^{ax}V$.	05

6	Equation reducible to linear differential equations with constant equations, Cauchy's linear differential equations, Legendre's linear differential equations, Simultaneous liner differential equations.	04
7	Complex numbers, Polar form of complex number. De'Moivre's theorem, nth roots of a complex number, Fundamental theorem of algebra (statement only), Multiple roots and test for multiplicity.	06
8	Expansions of $\cos n\theta, \sin n\theta, \tan n\theta$ in terms of $\cos\theta, \sin\theta, \tan\theta$ respectively ($n \in N$). Expansion of $cos^n\theta, sin^n\theta$ in a series of *cosines* or *sines* of multiple angles of θ ($n \in N$). Expansion of $\cos\theta, \sin\theta, \tan\theta$ in terms of θ.	04
9	Exponential, circular and hyperbolic functions.	04
10	Logarithm functions for complex and real numbers, Inverse circular and hyperbolic functions for complex and real numbers.	06
11	Definition of a sequence, bounded sequences, convergence of a sequence, subsequences, monotonic sequences, Cauchy's sequence, General principle of convergence of sequence (without proof), Some important sequences $\{\sqrt[n]{n}\}, \{\frac{a_1+a_2+\cdots+a_n}{n}\}$.	06
12	Reduction Formula of $\int sin^n x\, dx, \int cos^n x\, dx, \int sin^m x\, cos^n x\, dx, \int tan^n x\, dx, \int cot^n x\, dx$ where $m, n \in N; m, n \geq 2$. $\int_0^{\frac{\pi}{2}} sin^n x\, dx, \int_0^{\frac{\pi}{2}} cos^n x\, dx, \int_0^{\frac{\pi}{2}} sin^m x\, cos^n x\, dx$ where $m, n \in N; m, n \geq 2$.	04

Learning Outcomes:-

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

- Analyze differential equations.
- Solve Higher order ODES.
- Imagine three dimensional objects virtually.
- Understand the concepts of complex numbers and some complex functions.
- Use the sequences and reduction formulas.
- Demonstrate this knowledge by working suitable problems and developing their own proofs, and by presenting and writing work inside and outside of class.

Books Recommended:-

1. 'Analytical solid Geometry', **Shanti Narayan and Mittal P.K.**, *S. Chand And Co.* New Delhi.
2. 'Higher Engineering Mathematics, Thirty-fifth edition.', **B.S.Grewal**, *Khanna Publication*
3. 'The calculus with analytic geometry', **Louis Leithod**, *Harper- Collins Pub.*
4. 'The Elements of Co-ordinate Geometry', **S. L. Loney**, *Mac Milan & Co.*
5. 'A Textbook of Analytical Geometry of three dimensions', **P. K. Jain and Khalid Ahmad**.
6. 'Elementary Treatise on Co-ordinate Geometry of three dimensions', **R. J. T. Bell**, *Mac Milan Co.*
7. 'Advanced Engineering Mathematics', **Kreyszig E.**, *New Age International Publishing Co.*
8. 'Complex Variables and Applications', **R.V.Churchill, J.W.Brown**, *McGraw-Hill Book Co.*
9. 'Principles of Real Analysis', **S.C.Malik**, *New Age International, New Delhi.*
10. 'Integral Calculus', **Shanti Narayan and Mittal P.K.**, *S. Chand And Co.* New Delhi.

E-Resources:-

1. en.wikipedia.org/wiki/Analytic_geometry
2. www.britannica.com/EBchecked/topic/22548/analytic-geometry
3. www.jimloy.com/geometry/analytic.htm

4. http://mathworld.wolfram.com/AnalyticGeometry.html
5. ualr.edu/lasmoller/descartes.html
6. en.wikipedia.org/wiki/Linear_differential_equation
7. www.ufgop.org/pdf/calcululs-review-of-analytic-geomtry/
8. tutorial.math.lamar.edu/Classes/DE/Linear.aspx
9. www.khanacademy.org/math/differential-equations
10. en.wikibooks.org/wiki/Real_Analysis/Sequences
11. www.proofwiki.org/wiki/Definition:Real_Sequence
12. www.mathcs.org/analysis/reals/numseq/
13. en.wikipedia.org/wiki/Integration_by_reduction_formulae
14. archives.math.utk.edu/visual.calculus/4/recursion.2/
15. en.wikipedia.org/wiki/Complex_number
16. www.purplemath.com/modules/complex.htm
17. www.mathsisfun.com/numbers/complex-numbers.html
18. http://mathworld.wolfram.com/ComplexNumber.html
19. http://mathworld.wolfram.com/ComplexFunction.html
20. en.wikipedia.org/wiki/Complex_analysis

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF MATHEMATICS

COURSE: B.Sc.   **SEMESTER: II**
SUBJECT NAME: Mathematics Practical-II   **SUBJECT CODE: 4SC02MTP2**

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**		
0	**0**	**4**	**4**	**2**	--	--	--	--	10	10	30	50

Objectives: -The objective of this course is
- To learn Cones, Cylinders.
- To learn Conicoids and Cartesian co-ordinate.
- To learn higher order linear differential equations.
- To learn Sequence and reduction formula.
- To learn algebra of a complex number.
- To calculate the roots of any complex number.
- To learn Complex functions.

Prerequisites:-
Students must be familiar with the properties of functions, the algebra of functions, and the graphs of functions. Students should have basic knowledge differential equations. Also they should have basic knowledge of complex numbers of at least 10+2 level.

Course outline:-

Sr. No.	Course Contents
1	Integration of rational function of x and a linear surd $(Ax + B)(ax^2 + bx + c)^{-1/2}$ and $(Ax + B)(ax^2 + bx + c)^{1/2}$
2	Reduction formulae for integration of $\sin^n x$, $\cos^n x$, $\sin^m x \cos^n x$
3	Sketching of Quadric surfaces, Cone, Cylinder
4	General solution of Linear differential equations $F(D)y = X$, where $X = e^{ax}, \sin(ax + b), \cos(ax + b), x^m, e^{ax}V, xV$ (where V is a function of x Only), Reducible equation to LDE with constant coefficient
5	Descarte's rule of sign.
6	Solution of cubic equations (Cardan's method), Solution of biquadratic equations (Ferarri's method)
7	Algebra of Complex numbes, Complex functions
8	Angles between two curves, Radius of curvature for Cartesian, Parametric and polar equations
9	Arc length of the curves given in Cartesian, parametric and polar forms
10	Intrinsic equation for Cartesian and polar equations

Learning Outcomes:-

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

- Analyze differential equations.
- Solve Higher order ODES.
- Imagine three dimensional objects virtually.
- Understand the concepts of complex numbers and some complex functions.
- Use the sequences and reduction formulas.
- Demonstrate this knowledge by working suitable problems and developing their own proofs, and by presenting and writing work inside and outside of class.

Books Recommended:-

1. 'Analytical solid Geometry', **Shanti Narayan and Mittal P.K.**, *S. Chand And Co.* New Delhi.
2. 'Higher Engineering Mathematics, Thirty-fifth edition.', **B.S. Grewal**, *Khanna Publication*
3. 'The calculus with analytic geometry', **Louis Leithod**, *Harper- Collins Pub.*
4. 'The Elements of Co-ordinate Geometry', **S. L. Loney**, *Mac Milan & Co.*
5. 'A Textbook of Analytical Geometry of three dimensions', **P. K. Jain and Khalid Ahmad**.
6. 'Elementary Treatise on Co-ordinate Geometry of three dimensions', **R. J. T. Bell**, *Mac Milan Co.*
7. 'Advanced Engineering Mathematics', **Kreyszig E.**, *New Age International Publishing Co.*
8. 'Complex Variables and Applications', **R.V.Churchill, J.W.Brown**, *McGraw-Hill Book Co.*
9. 'Principles of Real Analysis', **S.C.Malik**, *New Age International, New Delhi.*
10. 'Integral Calculus', **Shanti Narayan and Mittal P.K.**, *S. Chand And Co.* New Delhi.

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: II**
SUBJECT NAME: Physics-II   **SUBJECT CODE: 4SC02PHC1**

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 objective of this course is that the students learn…

- Wave motion and Differential equation of a wave motion, Doppler effect in light and its applications.
- Natural and Artificial Radio activity, General Properties of Radioactive Radiation.
- Properties of sound.
- Dispersion, Fermat's Principle, Law of reflection & Law of refraction.
- Interference, Conditions for interference of light.
- Determination of wave length of Sodium light using Newton's rings.
- Thermal Conductivity of gas.
- Crystallography, Miller indices and Some Crystal structures:–NaCl, CsCl.
- Semiconductor diode, special purpose diode, and transistor theory.
- Production of X-rays, and practical application of X-rays.

Prerequisites:-

Students should have basic knowledge of Waves, Optics, Heat, Crystallography, Electronics & Modern Physics of at least 10+2 level.

Course outline:-

Sr. No.	Course Contents	Hours
1	**Nuclear Structure, Nuclear Transformations & Radioactivity:** Nuclear composition, Nuclear Structure, Nuclear magnetic resonance(NMR), applications of NMR, Stable nuclei, Radiometric dating, nuclear decay, Binding Energy, The strong interaction, Liquid drop model, Atomic Number, Atomic mass, Isotopes, Isomers, Isobars, Radioactivity, Units of Radioactivity, Natural and Artificial Radio activity, Chain Reaction, Properties & applications of Alpha, Beta & Gamma Radiation, Beta Disintegration, Conservation of energy during beta-rays, Radioactive Disintegration & its Laws, Decay Constant, Half-life Period, Average life, Uranium-Actinium &Thorium radioactive Series.	10
2	**X-rays : Laws, Production & applications:** Introduction, Properties and characteristics of X-rays, Production of X-rays, Origin of X-ray, X-ray Spectrum, X-rays Intensity Measurement, Wave nature of X-ray, Laue Spot & it applications , Bragg's Spectrometer, X-ray Diffraction, Bragg's Law, Crystal Structure, Compton effect, Properties & applications of X-rays.	06

3	**Waves :** Wave motion, amplitude, period, frequency, and wavelength, Differential equation of wave motion, Velocities of Particles & waves, Velocity of sound in air & water and Laplace's correction, velocity of sound in isotropic solids, velocity of transverse waves along a stretched string, Laws of transverse vibrations of strings, Verifications of Laws of vibrations, Melde's experiment, Vibrations of air columns, Organ pipe, Doppler effect in light and its applications, definition of resonance with examples, Resonator.	08
4	**Optics :** Properties of Light, Dispersion , Dispersive Power, Fermat's Principle, Law of reflection& Law of refraction from Fermat's Principle, Spectrometer with LCM, Interference, Conditions for interference of light , Types of Interference, Fresnel's Bi-prism, Lloyd's Single Mirror, Interference in thin films , Newton's rings , Determination of wave length of Sodium light using Newton's rings. Concepts of Diffraction, Concepts of Polarization.	06
5	**Basic Elements of Crystallography:** Introduction, Type of Solid, Periodic arrays of Atoms, Translation vector, Lattice points, Space lattice, Basis, Crystal structures, Unit cell and Primitive cell, Crystallography, Seven crystal systems, Bravais lattices in three dimensions, Miller indices of Crystal planes, Atomic Radius and Packing factor, Some Crystal structures: NaCl, CsCl & Diamond .	07
6	**Basics of Solid State Electronics :** Semiconductor diode & its V-I characteristics, Alternating & Direct currents, Use of diodes in rectifiers, Half wave rectifier, Efficiency & performance of half wave rectifier, Full-wave rectifier, Centre-tap full wave rectifier, Full wave bridge rectifier, Efficiency & performance of full-wave rectifier, Ripple factor, Filters, How to get better DC, Filter circuits, Types of filter Circuits, Shunt capacitor filter, Series inductor filter, Choke - input LC filter, The CLC or PI filter.	08
7	**Types of Diodes:** Types of diodes, Signal diodes, Power diodes, Zener diode, Voltage regulation Stabilizers, Zener effect, Avalanche effect, Varactor diodes, Principle-Construction-Working-Applications-Merits-Demerits of Light emitting diode, Principle-Construction-Working-Applications-Merits-Demerits of Photo diode, Optoisolator.	06
8	**Transistors Theory:** Introduction to Transistor structure, Working action of Transistor, Relation between currents in a transistor & parameters, Transistor amplifying action, Transistor configurations, Transistor characteristics, Common-Emitter configuration, current relations, relation between alpha and beta, Input and output Common Emitter characteristics, Basic Common Emitter amplifier circuit, DC load line, Operating point, Cut off and saturation points, Common base configuration, Characteristics of common base connection, Common collector connection, Comparison of transistor connections.	09

Learning Outcomes:-

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

- Wave motion and find velocity of sound in air.
- Technique of production of ultrasonic and its application.
- Determine the wavelength of sodium light.
- Understand crystal structures.
- Different types of diodes, transistors and its application.
- X-rays and application.
- Radio activity and properties of different radioactive rays.

Books Recommended:-

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

E-Resources :-

1. www.wikipedia encyclopedia
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.hyperphysics.com

CD Rom for e-leaning:

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: II**
SUBJECT NAME: Physics Practical-II   **SUBJECT CODE: 4SC02PHP2**

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	4	4	2	--	--	--	--	10	10	30	50

Objectives: -The objective of this course is that the students will be able…
- To perform melde's experiment.
- To study resonator.
- To determination of unknown wavelength and dispersive curve of prism.
- The verification of Series &Parallel connection of capacitor and inductor.
- To Determine V-I characteristics of different diodes and transistors.
- To study transformer.

Prerequisites:-
Students should have basic knowledge different component. Also they should have basic knowledge of at least 10+2 level.

Course outline:-

Sr. No.	Course Contents
1	Melde's Experiment.
2	Study of Resonator.
3	Calibration of Spectrometer & determination of unknown wavelength.
4	Dispersive curve of a prism.
5	Newton's rings, Determination of λ using sodium light.
6	Determination of the capacity 'C' of Capacitor. (verification of Series & Parallel connection of capacitor)
7	Determination of self-inductance 'L' of inductor (verification of series & Parallel connection of inductor)
8	Deflection magnetometer.
9	Study of a Transformer.
10	P-N Junction diode characteristics, Calculate dynamic resistance.(using PCB).
11	P-N Junction diode as Half Wave / Full Wave Rectifier.
12	P-N Junction diode as Bridge Rectifier.
13	V-I characteristics of Zener diode. (using PCB).
14	Zener diode as voltage regulator.
15	Characteristics of Photo diode.
16	Characteristics of Common Emitter Transistor. (input& output).
17	Law resistance by Potentiometer.

Learning Outcomes:-

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

- Calculate the unknown wavelength and wavelength of sodium light.
- Have knowledge of series and parallel connection of capacitor and inductor.
- Design different circuits.
- Use different types of diode and transistor in its application.
- Know about transformer.
- Draw graphs related to these practical.
- Analyze differential equations.

Books Recommended:-

1. 'Practical Physics',**C.L.Arora**, *S.Chand Company.*
2. 'Advanced Practical Physics',**M.S.Chauhan& S.P.Sing,** *Pragati Prakashan, Meerut.*
3. 'Experimental Physics', **University GranthNirman Board**, (Gujarati Medium).
4. 'Physics through experimentsVol. I & II',**B. Sarafetlal.**
5. 'Advanced Practical Physics',**S.L.Gupta and V.Kumar,** *Pragati Prakashan, 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
2. www.physic.org
3. www.Physicsclassroom.com
4. www.howstuffwork.com
5. www.colorado.edu/physics/2000
6. www.ndrs.org. physic.com
7. www.physlinc.com
8. www.fearophysic.com
9. www.hyper physics.com

FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY

COURSE: B.Sc.   **SEMESTER: II**

SUBJECT NAME: Chemistry-II   **SUBJECT CODE: 4SC02CHC1**

Teaching & Evaluation Scheme:-

Teaching hours/week				Credit	Evaluation Scheme/semester							
					Theory				Practical			
Th	**Tu**	**Pr**	**Total**		**Sessional Exam**		**University Exam**		**Internal**		**University**	**Total Marks**
					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 Electromotive Force, Photochemistry, Catalysis.
- 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	**Organic Chemistry:**
	Alcohols, Phenols and Ethers
	• IUPAC Nomenclature of Alcohols (Mono, di and trihydric alcohols), Phenols and Ethers
	• Physical Properties of Alcohols
	• Chemical Properties of Alcohols [Reactions of O-H bond cleavage and C-O bond cleavage - only reactions, no mechanisms]
	• Industrial Production of Phenol
	   1. Dow Process
	   2. Cumene Process
	• Physical Properties of Phenol
	• Chemical Properties of Phenol
	   1. Reactions of O-H group
	   2. Reactions of aromatic ring [Electrophilic substitution reactions, Reimer Tiemann Reaction, Kolbe Schmitt Reaction, Fries Rearrangement – with reaction mechanism]
	• Relative acidity of Alcohols and Phenols
	• Preparation of Ethers – Williamson Synthesis
	• Physical Properties of Ethers
	• Chemical Properties of Ethers
	   1. Substitution Reaction [Reaction with Cl_2 in dark & Reaction of Cl_2 in light]
	   2. Reactions involving C-O bond cleavage [hydrolysis, reaction with H_2SO_4, cold HI and hot HI]
		10

2	**Amines** ▪ Classification and Nomenclature ▪ Basicity of Amines ▪ Physical Properties of Amines ▪ Preparation of Primary amines [Reduction of nitro compounds, reaction of organic halides with ammonia, Hoffmann degradation of amides] ▪ Chemical Properties of Primary amines [Reaction with acid chlorides, aryl sulphonyl chlorides, reaction with alkyl halides] ▪ Chemical Properties of Aniline [Reactions of Aniline with acid chlorides, aryl sulphonyl chlorides, Reaction with bromine (formation of 2,4,6 –tri bromo aniline and p- bromo aniline) ▪ Diazotization of Aniline and reactions of Diazonium salt ▪ Hinesburg Reaction to distinguish between Primary, Secondary and Tertiary amines	10

3	**Inorganic Chemistry:**
	Ionic Solids
	▪ Introduction
	▪ Characteristics of ionic solids
	▪ Born Haber Cycle
	▪ Max Born Equation
	▪ Limiting radius ratio
	▪ Relation between radius ratio, coordination number and crystal structure
	▪ Derivation of r+/r- ratio in trigonal, square planar, body centred and tetrahedral crystal lattice
	▪ Crystal structure of ionic solids: HCP, BCP and FCC
	▪ Crystal structure of ionic solids
	   1. AB type - CsCl and ZnS (zinc blende)
	   2. AB2 type - CaF2 and TiO2
	▪ Defects in Ionic Crystal Lattice (stoichiometric and nonstochiometric)
	▪ Semi conductors
		08

4	**Molecular Orbital Theory** ▪ Basic Concepts of Molecular Orbital Theory ▪ Characteristics of molecular orbitals with necessary diagram (i.e. Bonding, anti-bonding, gerade and ungerade orbitals) ▪ Energy level diagram of diatomic molecules of First and Second row elements of periodic table and NO & CO molecules ▪ Electronic configuration of the above mentioned molecules and calculation of bond order and magnetic moment ▪ Comparison of MO and VB Theories	07

5	**Isomerism in Complexes**
	▪ Introduction
	▪ Types of isomerism
	   1. Ionization
	   2. Polymerization
	   3. Hydration
	   4. Coordination
	   5. Position isomerism
	   6. Stereoisomerism
		05

6	**Physical Chemistry:** **Electromotive Force** ▪ Introduction ▪ Types of Cell ▪ Half-cell ▪ Reversible and irreversible cell ▪ Convention sign ▪ Types of Electrodes ▪ Standard Electrode Potential ▪ Electrolytic Cell ▪ Galvanic Cell ▪ Emf series ▪ Representation of Cell	10

	▪ Relation between G, H and K ▪ Nernst Equation and its applications	
7	**Photochemistry** ▪ Laws of Photochemistry: Grothus- Drapper law; Lambert-Beers law; Stark-Einstein's law (i.e. law of photochemical equivalence) ▪ Quantum efficiency and Factors affecting quantum efficiency ▪ Reasons for low and high quantum yield ▪ Photo sensitization ▪ Fluorescence ▪ Phosphorescence ▪ Chemiluminescence	07
8	**Catalysis** ▪ Introduction ▪ Types of Catalyst ▪ Functions ▪ Theories ▪ Acid base Catalyst ▪ Enzyme Catalyst ▪ Applications	03

9	**Analytical Chemistry:**
	Basic Principles of Qualitative Analysis
	▪ Introduction
	▪ Factors affecting qualitative analysis: common ion effect, solubility product (ksp)
	▪ Use of NH4Cl and NH4OH in Qualitative Analysis
	▪ Use of HCl and H2S in Qualitative Analysis
	▪ Numerical on common ion effect and ksp
	▪ Necessary explanation with chemical equations in
	    1. Charcoal test
	    2. Cobalt nitrate test
	    3. Borax bead test
	    4. Flame test.
		10

10	**Water Analysis**
	▪ Analysis of hardness of water in terms of
	    1. Total solid and volatile solid
	    2. Non-filterable solid and non-filterable volatile solid
	    3. Filterable solid
	    4. Total solid
	    5. Total Suspended Solid
	    6. Acidity
	    7. Basicity or Alkalinity
	    8. Turbidity
	▪ Various method of determination of Hardness of Water
		10

Learning Outcomes:-

The students are expected to

- Understand basic atomic and molecular structure and factors that determine stability of inorganic compounds.

- Familiar with applications, hazards and precautions which should be taken while using radio-compounds**.**

- Apply thermodynamic to explain different types of chemical reactions.

Books Recommended:-

Organic Chemistry

1. 'Advanced Organic Chemistry',**ArunBahl and B.S.Bahl.**
2. 'Text Book of Organic Chemistry for BSc students',**B.S.Bahl**.

3. 'A Textbook of Organic Chemistry',**K.S. Tewari, N.K.Vishnoi and S.N. Mehrotra.**
4. 'Organic Chemistry (Volume I, II & III)',**S.M. Mukherji, S.P. Singh and R.P. Kapoor.**
5. 'Organic Chemistry', **Morrison and Boyd.**
6. 'Organic Chemistry',**T.W. Graham Solomons and Craig B. Fryhle.**
7. 'Organic Chemistry',**Francis A. Carey.**
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.**
14. 'Organic Chemistry',**I.L.Finar.**

Inorganic Chemistry

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

Physical Chemistry

1. 'A Textbook of Physical Chemistry',**P. L. Soni, O.P. Dharmarha and U.N. Dash.**
2. 'Physical Chemistry',**Dr. D. R. Pandit, A. R. Rao and Padke.**
3. 'Progressive Physical Chemistry',**Dr. Snehi**, *Merrut Publications.*
4. 'Principles of Physical Chemistry',**Puri, Sharma, Pathania.**
5. 'A text book of Physical Chemistry', **Samuel Glasstone.**
6. 'Elements of Physical Chemistry',**SamuelGlasstone and D lewis.**
7. 'Thermodynamics for Chemists',**SamuelGlasstone.**
8. 'Introduction to Electrochemistry',**S. Gladstone.**
9. 'A text book of Physical Chemistry', **B.K. Sharma.**
10. 'Emf',**B.K. Sharma.**
11. 'Principles of Physical Chemistry',**S.H.Maron and C.F.Prutton.**
12. 'Elements of Physical Chemistry',**B.R.Puri, L.R. Sharma, M.S.Pathania.**
13. 'Advanced Physical Chemistry',**J.N.Gurtu.**
14. 'Physical Chemistry',**N.Kundu and S.K. Jain.**
15. 'Physical Chemistry',**K. L.Kapoor.**

16. 'Thermodynamics',**Gurudeeep Raj.**
17. 'Comprehensive Physical Chemistry',**HemandSnehi.**
18. 'Introduction to Physical Chemistry',**Madan and Madan.**

Analytical Chemistry

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

E-Resources:-

1. http://www.chemguide.co.uk/atoms/properties/gcse.html
2. http://en.wikipedia.org/wiki/Chemical_bond
3. http://www.sparknotes.com/chemistry/bonding/properties/section1.rhtml
4. http://hyperphysics.phy-astr.gsu.edu/hbase/chemical/bond2.html
5. http://www.chem1.com/acad/webtext/chembond/cb01.html
6. http://en.wikipedia.org/wiki/Nuclear_chemistry
7. http://www.chem.duke.edu/~jds/cruise_chem/nuclear/nuclear.html
8. http://library.thinkquest.org/10429/low/nuclear/nuclear.htm
9. http://www.visionlearning.com/library/module_viewer.php?mid=59
10. http://en.wikipedia.org/wiki/Chemical_thermodynamics
11. http://www.shodor.org/unchem/advanced/thermo/
12. http://www.chem.arizona.edu/~salzmanr/480a/480ants/chemther.html
13. http://en.wikipedia.org/wiki/Laws_of_thermodynamics

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY

COURSE: B.Sc.   **SEMESTER: II**

SUBJECT NAME: Chemistry Practical-II   **SUBJECT CODE: 4SC02CHP1**

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		
0	0	6	6	3	--	--	--	--	10	10	30	50

Course outline:-

Sr. No.	Course Contents
1	**Qualitative Analysis of Inorganic Salts** (15 salts - 2 radicals) Inorganic salts containing chlorides, bromides iodides, nitrates, nitrites, sulphates, sulphites, sulphides, carbonates phosphates, oxides, chromates, and dichromates as an anion.
2	**Inorganic Volumetric Analysis: (Standard Solutions should be given)** ▪ Estimation of the amount of Cu^{2+} in the given $CuCl_2.2H_2O$ solution using 0.01 M EDTA solution ▪ Estimation of the amount of Ni^{2+} in the given $NiSO_4.7H_2O$ solution using 0.01 M EDTA solution ▪ Estimation of the amount of Zn^{2+} in the given $ZnCl_2$ solution using 0.01 M EDTA solution ▪ Estimation of total, temporary & permanent hardness of water. ▪ Determination of acetic acid in commercial vinegar using 0.1 M NaOH
3	**Demonstrative practical:** ▪ Calibration of Glassware (Measuring Cylinder & flasks) ▪ Crystallization of Inorganic compounds (3-4 compounds) ▪ Preparation of standard solutions (Primary & Secondary)

C. U. SHAH UNIVERSITY

DEPARTMENT OF BOTANY
FACULTY OF SCIENCE

COURSE: B.Sc.   **SEMESTER: II**
SUBJECT NAME: Botany-II   **SUBJECT CODE: 4SC02BOC1**

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 course will help the student to plant diversity like lower plant kingdom and higher plant kingdom.
- To understand origin, evolution of land plants and fossils.

Prerequisites:-

- Students should have basic knowledge of plant biology.

Course outline:-

Sr. No.	Course Contents	Hours
1	**Algae & Fungi** General characters, structure, reproduction, economic importance of algae and fungi. Life history of algae: CYANOPHYTA: Rivularia, Scytonema CHLOROPHYTA: Coleochaete, Chara PHAEOPHYTA: Sargassum RHODOPHYTA: Polysiphonia Life history of fungi: MASTIGOMYCOTINA: Phytophthora ASCOMYCOTINA: Peziza and Aspergillus BASIDIOMYCOTINA: Ustilago General account of Mycoplasma and Actinomycetes	10
2	**Bryophytes&Pteridophytes** Adaptation in Bryophytes and land plants Structure, Reproduction and life history (excludingdevelopment): HEPATICOSPODIA: Pellia ANTHOCEROTOPSIDA: Notothylas BRYOPSIDA: Polytrichum, Sphagnum Pteridophytes (including Fossils) Structure, Reproduction and life history (excluding development): PSILOTOPSIDA: Psilotum SPHENOPSIDA: Equisetum Stelar evolution in Pteridophytes,Pteridophytes	10
3	**ANATOMY** Mechanical tissue system, Secretory tissue system (excluding Laticiferous), Absorbing tissue system. Root development: lateral roots, root hairs, root-microbe interaction. Leaf – fall. Root – stem transition.	8
4	**CELL BIOLOGY:**	10

	Ultra structures and functions: Plasma membrane: Structure, Unit membrane concept, Sandwich model, Greater membrane concept, Fluid-mosaic model. Chromosomes: Morphology and structure of Polytene, chromosome, Lamp brush chromosome. Cell differentiation. Cell-cell interaction. Cell Cycle: Interphase, Mitosis, Meiosis Programmed Cell Death (PCD) in plants	
5	**Genetics and Molecular biology** DNA and RNA Composition and Structure. Watson and Crick's model of DNA. Types of RNA. DNA Replication. Genetic code. Protein Synthesis. Regulation of gene expression in prokaryotes.	10
6	**BIOCHEMISTRY:** Amino acids: Classification, structure, protein and non-protein amino acids Protein: Classification of protein on the basis of structure Lipids: Synthesis, alpha & Beta -oxidation Nitrogen metabolism and Nitrogen fixation General account of structure and functions of vitamins	12

Learning Outcomes:-

The students are expected to

- Understand basics bio diversity and basic of genetics biochemistry.

Books Recommended:-

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. 'Taxonomy of Angiosperms', **B. P. Pandey,** S. Chand Publication.
6. 'Gymnosperms',**Bhatnagar, S. P. and Moitra, A.,**New Age International Pvt. Ltd., New Delhi.
7. 'A Textbook of Botany vol. I and II', **S.N. Pandey, P. S. Trivedi and S. P. Misra**., Vikas Publication House Pvt. Ltd
8. 'Algae ,Fungi, Bryophyte, Pteridophyte',**Vasishta,**S. Chand Publication.
9. 'Taxonomy of Angiosperms', **Naik, V. N.,**Tata McGraw - Hill Publishing Co. Ltd. New Delhi.
10. 'Introduction to Taxonomy of Angiosperms', **Verma B. K.,** PHI Learning Private Ltd. New Delhi
11. 'Botany for degree students- Vol. V',**P. C. Vasishta**, S. Chand, Delhi.
12. 'Gymnosperm',**G. L. Chopra**, S.Nagin& Co., Jullundhar.
13. 'Molecular Cell Biology ', **Lodish, H., Berk, A., Zipursky, S.L., Matsudaira, P.Baltimore, D. and Darnell, J.,**W.H. Freeman and Co., New York, USA.
14. 'Genes VIII', **Lewin, B.**, Oxford University Press, New York.
15. 'Principals of Genetics', **Snustad, D.P. and Simmons**, M. J.,John Wiley & Sons, Inc., USA.

16. 'Molecular Genetics', **Stent, G.S.,** *CBS Publication.*
17. 'Genomes', **Brown, T.A.,** *John Wiley & Sons (Asia) Pvt. Ltd., Singapore*

E-Resources:-
1. en.wikipedia.org/wiki/Effect_of_climate_change_on_plant_biodiversity
2. botany.si.edu/projects/cpd/introduction.htm
3. www.fao.org/biodiversity/components/plants/en/
4. http://diversityplantpropagation.com.au/
5. en.wikipedia.org/wiki/Plant_genetics
6. anthro.palomar.edu/mendel/mendel_1.htm
7. http://agbiosafety.unl.edu/education/summary.htm

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF BOTANY

COURSE: B.Sc.   **SEMESTER: II**

SUBJECT NAME: Botany Practical-II   **SUBJECT CODE: 4SC02BOP2**

Teaching & Evaluation Scheme:-

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

Objectives: -
- To acquaint students with the concepts of cell biology and genetics.
- To assist students with basic knowledge of mitosis and meiosis and explain how cell division process also affects DNA and RNA.
- To understand characteristic and importance of Amino acids.

Prerequisites:-
- Students should have basic knowledge of plant biology.

Course outline:-

Sr. No.	Course Contents
1	To study mitosis in onion root tip by squash method
2	Detail study of Genetic Codes.
3	Study of structure of Nucleic acids (DNA, RNA) through charts or models- Watson & Crick Model
4	DNA Replication and Protein Synthesis through charts or models.
5	Isolation and estimation of RNA and DNA.
6	Study of mechanicaltissues through fresh /preserved material. (i) Types of Collenchyma (ii) Sclerenchyma and sclereids
7	Distribution ofmechanicaltissuesfromfollowings: (i) Sunflower Stem (ii)Nyctanthes Stem (iii) Maize stilt root (iv) Maize leaf
8	To study secretory tissue system through fresh material or permanentslides: Lemon leaf, Eucalyptusleaf, Cycasrachis(MucilageDuct)
9	Identify and classify following types: ALGAE: Rivularia, Scytonema, Coleochaete. FUNGI: Aspergillus

10	Structure and Reproductive organs: ALGAE Chara, Sargassum, Polysiphonia FUNGI: Phytopthora, Peziza, Ustilago BRYOPHYTA: Notothylas, polytrichum: Sex organs & Capsule PTERIDOPHYTA: Equisetum: Cones
11	Identify and classify following types: BRYOPHYTA: Pellia, Sphagnum. PTERIDOPHYTA: Psilotum (Stem), Equisetum
12	Structure and Reproductive organs: BRYOPHYTA: Notothylas, Polytrichum: Sex organs & Capsule PTERIDOPHYTA: Equisetum: Cones

Learning Outcomes:-

This course is designed to

- Deliver a detailed understanding of different types of ultra cell structures which are responsible for cell division and genetic materials.
- Importance of various molecules for cell division, cell formation, cell growth and genetic material.

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF ENGLISH

COURSE: B.Sc.   **SEMESTER: II**
SUBJECT NAME: Functional English -ll   **SUBJECT CODE: 4SC02FEN1**

Teaching & Evaluation Scheme:-

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

Note: Total column after University Exam Hrs shows 100.

Objectives:-
- To train students in basic fundamentals skills of Communication – LSRW
- To train students in basic fundamentals skills of Communication – LSRW in English
- To provide students the value education for better society
- To make students 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 content:-

Sr. No.	Course Contents	Min. Hours
0	**Prerequisites**	02
	Part A: LSRW Skills	
1	**Concepts of Grammar** • Subject – Verb Agreement / Concord • Conjunctions • Conditionals • Causal Verbs • Active – Passive Voice • Direct – Indirect Speech • Common Errors in English	14
2	**Comprehension Skills** • Selected texts will be given to the students for reading.	06
3	**Paragraph Writing** • What is Paragraph? • Components of Paragraph – Unity, Topic Sentence, Cohesion, Coherence, Adequate Development • Approaches of Paragraph – Inductive , Deductive & Expository Approach • Types of Paragraph • Attributes of good paragraph	10

	• Use of Transitional Words • Expand the idea	
4	**Listening Skill** • What is listening? • Difference between hearing & listening • Types of Listening • Traits of a good listener (During Lab hours only – Students will perform practical sessions by listening speeches delivered by sapient personalities)	08
5	**Speaking Skill** • Students will present their views orally on the basis of understanding what they have read from the texts. **Role Play** Students will learn through role play • Students will be shown some role-play videos (two-three videos) • On the basis of role-play video observation students will perform character based role-play.	
6	**Vocabulary Building** • Synonyms • Antonyms • One Word Substitute	04
7	**Fusion- An Anthology of English Prose & Poetry** **Part-1 Prose:-** 1) A Letter Dhumketu 2) Waiting for Death DamodarMauzo 3) An Astrologer's Day R. K. Narayan 4) A gift of Maggie O' Henry 5) Such Perfection R. K. Narayan **Part-2 Poetry:-** 1) Photographing Mother Sundram 2) Evening Song NalinRaval 3) Sonnet William Shakespeare 4) The Road Not Taken Robert Frost 5) Stopping By Woods on a Snowy Evening Robert Frost	18

Total: 30 Lec + 30 Pra = 60 Hrs.

Books Recommended:-

1. *A High School English Grammar*, **Wrenn& Martin,** S. Chand Publications
2. *An Intermediate English Grammar*, **Raymond Murphy**, Cambridge University Press
3. *Technical Communication : Principles and Practice*,**Meenaxi Raman and Sangeeta Sharma,** Oxford Press
4. *Contemporary Indian Short Stories, Series – I & II*, SahityaAkademi, New Delhi
5. *Modern Gujarati Poetry: A Selection, translated by* **SagunaRamnathan and Rita Kothari,**SahityaAkademi (English Translation), New Delhi.
6. *Effusions: An Anthology of English Prose and Poetry,* **ed. by Marathwada University**, Oxford University Press,1987
1. Expanding the idea: http://komarajuvenkatavinay.wordpress.com-2009-07-10-how-to-write-do-proverb-expansion-or-exapnsion-of-an-idea/

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF COMPUTER SCIENCE

COURSE: B.Sc.   **SEMESTER: II**
SUBJECT NAME: Computer Applications   **SUBJECT CODE: 4SC02CAE1**

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**		
1	**0**	**2**	**3**	**2**	15	1	35	1.5	10	10	30	100

Objectives: -

Basic computing skills are very important in today's world. Computers are a part of our day to day life. Engineering students learn soft skills for overall development to solve their problems. Basic computing Skills are a necessity that aids the students to perform day to day operations. This course introduces the Students with basic skills as a building block of their higher level computing skills.

Prerequisites:-

- Basic computer skills.

Course outline:-

Sr. No.	Course Contents	Hours
1	**Introduction to Computer** History, Applications, Working principal of computer, Components of computer, Hardware peripherals, Software, Windows and its components, Working with programs, Managing files and folders.	04
2	**Introduction of Operating System** Introduction, Different types of operating system (DOS, WINDOWS, LINUX), DOS/UNIX COMMANDS (cmd, cd ,date, echo, dir, md, mkdir, rd, rmdir, copy, delete, ren, format, edit).	03
3	**Working with Microsoft Office** Why MS office works? , Help assistance in MS office.	02
4	**Working with Microsoft Word** Introduction and application of word, Creating and saving new word document, Different operations on word document, paragraph, table, margin, font styles and size, hyperlink, change case ,highlighting texts, alignment , spacing, numbering, borders and watermark, header, footer, mail merge, find and replace text, Printing and setting layout of documents.	05
5	**Working with Microsoft Excel** Introduction and application of excel, Creating worksheet, Entering, Editing Cells, Inserting Rows and Columns, Inserting and Deleting Cells, Moving & Copying Data, Filling an Entry Range, Auto filling a range, Entering a Simple Calculations, Building a Simple Formula, Sum Function, Copying Formulas, Average Functions, Function Wizard**,** Formatting worksheets Formatting text**,** Auto format**,** Adding borders**,** Conditional formatting**,** Charts**,** Creating default chart**,** Creating and formatting chart using chart wizard.	05

6	**Working with Microsoft Power point** Introduction and application of power point, Creating and formatting new presentation, Selecting templates and setting layouts, Selecting fonts and font styling's, Adding text slides, Drawing shapes , lines, Adding Shadows and 3-D Effects, Adding transition effects, Animations, Slideshow, Making a real-time presentation, Use of charts and pictures in slides, Formatting box.	05
7	**Introduction to Internet** Introduction about Internet, History and evolution, How internet works? Understanding www and web browser, Search engines, Email, Messaging.	03
8	**Working with HTML** Introduction and application, Different Tools, different html tags, Creating forms In html page.	03

Learning Outcomes:-

The course content should be taught and implemented with the aim to develop different types of skills
Leading to the achievement of the following competencies

- Basic Computer Skills.
- Technical Writing Skill, Presentation Skill.
- Able to Develop and Design Simple Web-Page using HTML.

Books Recommended:

1. 'Microsoft Office XP Plain and Simple',*PHI Publication.*
2. 'Complete Reference HTML',**Thomas A. Powell,** *TMH Publication*.

E-Resources:

1. www.w3cschools.com
2. www.microsoft.com
3. www.careerlattice.com

C. U. SHAH UNIVERSITY

FACULTY OF SCIENCE
DEPARTMENT OF STATISTICS

COURSE: B.Sc.   **SEMESTER: II**
SUBJECT NAME: Fundamental of Statistics   **SUBJECT CODE: 4SC02STE1**

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		
2	0	0	2	2	30	1.5	70	3	--	--	--	100

Objectives: -
- Construct a frequency table
- To learn probability and its theorem
- Algebra of Random variables
- Compilation, Classification and diagrammatic representation of statistical data

Prerequisites:-
- Understanding of statistical concepts, basic concepts of probability and algebra.

Course outline:-

Sr. No.	Course Contents	Hours
1	**Classification and Presentation of Data** Concept of Statistical Population, Sample, Types of data: Discrete, continuous, frequency and non grouped, nominal, ordinal, interval, ratio, time series data and cross sectional data, primary, Secondary, internal and external data Idea of a questionnaire, schedule, major sources including some government publication, Construction of frequency table (One and Two factors), diagrammatic and graphical representation of ungrouped and grouped data, histogram, frequency curve, ogives, stem and leaf plot, box-plots.	06
2	Sample space, algebra of events, axiomatic definition of probability, combinatorial problems. Independent events, conditional probability. Partitionofsamplespace, totalprobabilitytheorem, Baystheorem.	06
3	Random variables: discrete and continuous, density and distribution functions, expectation, variance,moments,probabilitygeneratingandmomentgenerating functions, reproductivepropertyfunctions, distribution functions, expectation,variance,moments,probabilitygeneratingandmomentgenerating functions, reproductiveproperty.	06

4	Compilation,classification,tabulationanddiagrammaticrepresentationofStatisticaldata,frequency distributionofdiscreteandcontinuousdata,histogram,frequencypolygon,frequencycurve,ogives, stem andleafplot.Measuresoflocationanddispersion(includingboxandwhiskerplot)	06
5	Moments: non–central andcentralandtheirrelations.Measuresofskewnessandkurtosis.Measuresofassociationofattributes(2x2andpxqcontingencytables). Fittingofbinomial,Poissonandnormaldistributions.	06

Learning Outcomes:-

- To organize data for appropriate statistical analysis
- To effectively display the information in data sets graphically
- Students shall be able to use and apply a wide variety of specific statistical methods

Books Recommended:-

1. 'Introduction to the Practice of Statistics, 4th Edition', **Moore, S. David, McCabe, P. George,**_W. H. Freeman and Company, New York._
2. 'Basic Statistics',**Agarwal, B. L.,**_New Age International (P) Ltd., (1995)._
3. 'Introduction to the theory of Statistics',**Mood, A. M., Greybill, F.A., Boes, D.C.,**_McGraw Hill._
4. 'Statistics: A beginner's Text, Vol. I', **Bhatt, B.R. Srivenkatramana, T. and Raomadhav, K.S.,** _New age International (P) Ltd., (1996)._
5. 'Quantitative methods for Business and Economics',**Burton, G. Carrol, G. And Wall, S.,**_Lengman, New York, (1999)._
6. 'An introduction to appliled statistics – A modelling approach 2nd Ed. , 2003',**Lindsey, J. K.,**_Oxford University Press._
7. 'Basic Statistical Computing', **Cooke, Cramer and Clarke,**_Chapman and Hall_.
8. **'**Applied Linear Statistical methods',**Morrison, D.F.,**_Upper Saddle River, N.J. Prentice Hall, (1983)._
9. 'Basic Statistics, A premier for the biomedical Sciences 2nd Ed.',**Dunn,**_John Wiley and sons._
10. 'In introduction to Mathematical Statistics', **Hogg, R.V. and Craig, A.T.,**_Amerind Publishing Co._
11. 'Statistics: A guide to the unknown',**Tanur, J.M., Mosteller, F. Kruskal, W. H. Link, R.F., Pieters, R.S., Rising, G.R. (Special Editor: E. L. Lehman),**_Holden Day, San Francisco, (1989)._
12. 'Introduction to Probability and Statistics 9th Ed.',**Mendenhall, W.,**_North Scituate, Mass, Duxbury, (1994)._

E-Resources:-

1. en.wikipedia.org/wiki/Statistics
2. en.wikipedia.org/wiki/Mathematical_statistics
3. stats.grok.se/
4. stats.wikimedia.org/