SHAHEED BHAGAT SINGH STATE UNIVERSITY, FEROZPUR

B.Sc. Non-Medical (Study Scheme 2022)

Semester-V

Course Code	Course Title	Load Allocation			Marks Distribution		Total	Credits
		L	T	P	Internal	External		
BSNM 501C	Physical Chemistry-III	3	0	0	25	50	75	3
BSNM 502C	Inorganic Chemistry-IV	3	0	0	25	50	75	3
BSNM 503C	Mathematical Physics	3	0	0	25	50	75	3
BSNM 504C	Quantum Mechanics	3	0	0	25	50	75	3
BSNM 505C	Probability Theory	3	0	0	25	50	75	3
BSNM 506C	Modern Algebra	3	0	0	25	50	75	3
BSHU 501C	English-V	3	0	0	25	50	75	3
BSHU 502C BSHU 503C	Punjabi-V/ Punjab History & Culture-V	3	0	0	25	50	75	3
BSNM 507C	Physics Lab-V	0	0	4	30	20	50	2
BSNM 508C	Chemistry Lab-V	0	0	4	30	20	50	2
	TOTAL	24	0	8				28

Dr. Arvind Gupta
Associate Prof

Dr. Karanvir Singh
Professor

Mr. Chanchal Jindal
Industrialist

Dr. Gaurav Dhuria
Associate Professor

Dr. Sushil Kumar
Professor

Dr. Parwinder Singh
Assistant Professor

Dr. Rohit Mehra
Associate Professor

Dr. Nareshpal Saini

Dr. Gaurav Bhargava
Associate Professor

Dr. Manoj Kumar
Professor

Dr. Lalit Sharma
Professor

Dr. Sangeeta Sharma

Dr. Vishal Sharma
Associate Professor

Dr. Kulbhushan Agnihotri
Professor

Dr. Ramandarpal Singh
Professor

Dr. Rakesh Kumar
Associate Professor

Dr. K Sunil Behal
Assitant Professor

Dr. Kiranjeet Kaur
Professor

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SHAHEED BHAGAT SINGH STATE UNIVERSITY, FEROZPUR

B.Sc. Non-Medical (Study Scheme 2022)

Semester-VI

Course Code	Course Title	Load Allocation			Marks Distribution		Total	Credits
		L	T	P	Internal	External		
BSNM 601C	Organic Chemistry-IV	3	0	0	25	50	75	3
BSNM 602C	Physical Chemistry-IV	3	0	0	25	50	75	3
BSNM 603C	Nuclear and Particle Physics	3	0	0	25	50	75	3
BSNM 604C	Electronics	3	0	0	25	50	75	3
BSNM 605C	Numerical Methods	3	0	0	25	50	75	3
BSNM 606C	Statistical Methods	3	0	0	25	50	75	3
BSHU 601C	English-VI	3	0	0	25	50	75	3
BSHU 602C BSHU 603C	Punjabi-VI/ Punjab History & Culture-VI	3	0	0	25	50	75	3
BSNM 607C	Physics Lab-VI	0	0	4	30	20	50	2
BSNM 608C	Chemistry Lab-VI	0	0	4	30	20	50	2
	TOTAL	24	0	8				28

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Dr. Manoj Kumar
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Dr. Lalit Sharma
Professor

Dr. Sangeeta Sharma

Dr. Vishal Sharma
Associate Professor

Dr. Kulbhushan Agnihotri
Professor

Dr. Raminderpal Singh
Professor

Dr. Rakesh Ku
Associate Prof

Dr. K Sunil Behal
Assitant Professor

Dr. Kiranjeet Kaur
Professor

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Shaheed Bhagat Singh State University,Ferozepur

Course Name	B.Sc. (Non-Medical)
Subject Code:	BSNM 503C
Subject Title	MATHEMATICAL PHYSICS
Contact Hours:	L:3 T:0 P:0 Credits:3

Unit	Content
I	**First Order and Second Order Ordinary Differential equations:** First Order Differential Equations and Integrating Factor. Homogeneous Equations with constant coefficients: Wronskian and general solution. Statement of existence and Uniqueness Theorem for Initial Value Problem. Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers. (10 Lectures)
II	**Vector Calculus:** Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields. (08 Lectures)
III	**Vector Differentiation:** Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities. Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields. Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications. (12 Lectures)
IV	**Orthogonal Curvilinear Coordinates:** Orthogonal Curvilinear Coordinates. Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems. Dirac Delta function and its properties: Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function. Properties of Dirac delta function. (10 Lectures)

Reference Books:

1. Mathematical Methods for Physicists, G.B. Arfken, H.J. Weber, F.E. Harris, 2013, 7th Edn., Elsevier.
2. An introduction to ordinary differential equations, E.A. Coddington, 2009, PHI learning
3. Differential Equations, George F. Simmons, 2007, McGraw Hill.
4. Mathematical methods for Scientists and Engineers, D.A. McQuarrie, 2003, Viva Book.
5. Mathematical Physics, Goswami, 1st edition, Cengage Learning.
6. Advanced Engineering Mathematics, Erwin Kreyszig, 2008, Wiley India.
7. Essential Mathematical Methods, K.F.Riley & M.P.Hobson, 2011, Cambridge Univ. Press.

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Course Name	B.Sc. (Non-Medical)
Subject Code:	BSNM 504C
Subject Title:	Quantum Mechanics
Contact Hours:	L:3 T:0 P:0 Credits:3

Unit	Content
I	**Time dependent and independent Schrodinger equation:** Time dependent Schrodinger equation, dynamical evolution of a quantum state; Interpretation of Wave Function, Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions. Position, momentum & Energy operators; Expectation value, Commutator of position and momentum operators; Wave Function of a Free Particle. Time independent Schrodinger equation, Hamiltonian, stationary states and energy eigenvalues; General solution of the time dependent Schrodinger equation. wave packets, Fourier transforms and momentum space wave function; Position-momentum uncertainty principle. (10 Lectures)
II	**Applications of Schrodinger Equation:** General discussion of bound states in an arbitrary potential- continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem- square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigenfunctions using Frobenius method. (10 Lectures)
III	**Quantum theory of hydrogen-like atoms:** time independent Schrodinger equation in spherical polar coordinates; separation of variables for the second order partial differential equation; angular momentum operator and quantum numbers; Radial wavefunctions from Frobenius method; Orbital angular momentum quantum numbers l and m; s, p, d,.. shells (idea only) (10 Lectures)
IV	**Atoms in Electric and Magnetic Fields:**- Electron Angular Momentum. Space Quantization. Electron Spin and Spin Angular Momentum. Larmor's Theorem. Spin Magnetic Moment. Zeeman Effect: Electron Magnetic Moment & Magnetic Energy, Gyromagnetic Ratio & Bohr Magneton. Atoms in External Magnetic Fields: Normal and Anomalous Zeeman Effect. (10 Lectures)

Recommended Books:

1. A Text book of Quantum Mechanics, P.M.Mathews & K.Venkatesan, 2nd Ed., 2010, McGraw Hill
2. Quantum Mechanics, Robert Eisberg and Robert Resnick, 2nd Edn., 2002, Wiley.
3. Quantum Mechanics, Leonard I. Schiff, 3rd Edn. 2010, Tata McGraw Hill.
4. Quantum Mechanics, G. Aruldhas, 2nd Edn. 2002, PHI Learning of India.
5. Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning.
6. Quantum Mechanics, Eugen Merzbacher, 2004, John Wiley and Sons, Inc.
7. Introduction to Quantum Mechanics, David J. Griffith, 2nd Ed. 2005, Pearson Education

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Course Name	B.Sc. (Non-Medical)
Subject Code:	BSNM 508C
Subject Title:	Physics Lab- V
Contact Hours:	L:0 T:0 P:4 Credits:2

Instructions: At least 12 experiments from the following list should be performed.

List of Experiments:

1. Measurement of Planck`s constant using black body radiation and photo-detector.
2. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light.
3. To determine work function of material of filament of directly heated vacuum diode.
4. To determine the Planck`s constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the ionization potential of mercury.
7. To determine the absorption lines in the rotational spectrum of Iodine vapour.
8. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
9. To setup the Millikan oil drop apparatus and determine the charge of an electron.
10. To show the tunneling effect in tunnel diode using I-V characteristics.
11. Measurements of length using vernier calliper, screw gauge and travelling microscope.
12. To determine the height of an inaccessible object using a sextant.
13. To determine the horizontal distance of an object using a sextant.
14. To determine the vertical distance of an object using a sextant.
15. Study of Electron spin resonance- determine magnetic field as a function of the resonance frequency.
16. Study of Zeeman Effect: with external magnetic field; Hyperfine splitting.
17. To study the quantum tunneling effect with solid state device, e.g. tunneling current in backward diode or tunnel diode.

Reference Books:

1. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. Engineering Practical Physics, S.Panigrahi & B. Mallick,2015, Cengage Learning India Pvt. Ltd.
4. Practical Physics, G.L. Squires, 2015, 4th Edition, Cambridge University Press.
5. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn, 201, Kitab Mahal.
6. B Sc: Practical Physics, C. L. Arora, S. Chand & Co.
7. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

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Course Name	B.Sc. (Non-Medical)
Subject Code:	BSNM 603C
Subject Title:	Nuclear and Particle Physics
Contact Hours:	L:3 T:0 P:0 Credits:3

Unit	Content
I	**Structure and Properties of the Nucleus:** Structure of the nucleus: Discovery of the nucleus, composition, basic properties; charge, mass, size, spin, magnetic moment, electric quadrupole moment, binding energy, binding energy per nucleon and its observed variation with mass number of the nucleus, coulomb energy, volume energy, surface energy, other corrections, explanation of the binding energy curve, liquid drop model of the nucleus, evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, nuclear force.
II	**Radioactive decays:** Alpha decay: basics of a-decay processes, theory of alpha emission, Gamow factor, Geiger Nuttall law, a-decay spectroscopy. (b) ß-decay: energy kinematics for ß-decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. **Reactions:** Types of Reactions, Conservation Laws, kinematics of reactions, Nuclear Q-value, reaction rate, reaction cross section, Concept of compound and direct reaction, resonance reaction, Coulomb scattering (Rutherford scattering). (10 Lectures)
III	**Interaction of Radiation with Matter:** Energy loss of particles in passage through matter, stopping power of matter for charged particles, energy range relationship and straggling. Interaction of gamma radiation with matter: photoelectric effect, Compton effect and pair production. Thomson scattering and Rayleigh scattering. Detectors and Accelerators: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector, Need for accelerators. (10 Lectures)
IV	**Cosmic Rays and Elementary Particles:** Discovery of cosmic rays: hard and soft components, discovery of elementary particle, muon, pion, heavy mesons and hyperons, mass and life time determination for muon and pion. Primary Cosmic Rays: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. (10 Lectures)

REFERENCE BOOKS:

1. Concept of modern physics, 6th edition A.Beiser,S. Mahajan and SR Chaudhary Tata McGraw Hills.
2. Nuclear Physics I.Kaplan addition Wesley publishing company Inc.
3. Physics for degree students CL Arora and P.S.Hemne, S Chand and Co., 2014.
4. Nuclear and Particle Physics: An introduction, by Brian R.Martin and Graham Shaw, 3rd edition 2019.
5. Introduction to Nuclear and Particle Physics by Saverio D'Auria, Springer 2018.

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Course Name	B.Sc. (Non-Medical)
Subject Code:	BSNM 604C
Subject Title:	Electronics
Contact Hours:	L:3 T:0 P:0 Credits:3

Unit	Content
I	**Semiconductors:** Energy band diagram in semiconductors ,Direct and indirect semiconductors. Formula to calculate Fermi level in P and N semiconductors, barrier formation, energy band diagram of PN junction, formula for depletion width, qualitative ideas of current flow mechanism in forward and reverse biased diode,depletion and diffusion capacitance (10 Lectures)
II	**Circuit theory:** Voltage sources, current sources ,capacitors, inductors, linear circuits, KCL, KVL, Mesh and Node Analysis, level shifting, Thevenin and Norton equivalent circuits, power and energy relationship in case of R,L and C, maximum power transfer theorem, series and parallel connection of mutually coupled coil, equivalent circuit of transformer. (10 Lectures)
III	**Transistor Circuits:** Feedback amplifiers; classification of amplifiers, feed-back concept. Sinusoidal oscillations; phase shift oscillators, Wien Bridge Oscillator, Crystal oscillator. Basic idea about AM modulation and demodulations, Oscilloscope. (10 Lectures)
IV	**Digital Principles:** Number system, Decimal, binary, Octal, hexadecimal, logic gates. AND, OR, NOT, NAND, NOR, XOR, XNOR, Karnaugh map techniques. (10 Lectures)

REFERENCE BOOKS:

1. Integrated Electronics: J.Millman and C.C.Halkias (Tata McGraw Hill,2001).
2. Electronic Devices & Circuits–J.Millman and C.C.Halkias (Tata McGraw Hill, 2009).
3. Digital Principles & Applications–P.Malvine & Leach (Tata McGraw Hill,1993
4. Circuit theory fundamentals and applications,Aram Budak(Prentice Hall,1987)

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Shaheed Bhagat Singh State University, Ferozepur

Course Name	B.Sc. (Non-Medical)
Subject Code:	BSNM 608C
Subject Title:	Physics Lab VI
Contact Hours:	L:3 T:0 P:0 Credits:2

Instructions: At least 12 experiments from the following list should be performed.

List of Experiments

1. Characteristics of pn junction diode
2. Characteristics of Zener diode
3. To determine the resistivity of semiconductors.
4. Measurement of susceptibility of paramagnetic solution (Quinck s Tube Method)
5. To draw the plateau of a GM counter and find its dead time.
6. To study the characteristics of GM counter.
7. To measure the Dielectric Constant of a dielectric Materials with frequency.
8. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR).
9. To determine the refractive index of a dielectric layer using SPR.
10. To study the Hysteresis loss of a magnetic material.
11. To study the BH curve of iron using a Solenoid and determine the energy loss.
12. To measure the resistivity of a semiconductor (Ge) crystal with temperature by four-probe method (room temperature to 150°C and to determine its band gap.
13. To determine the Hall coefficient of a semiconductor sample.

REFERENCE BOOKS:

1. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. Engineering Practical Physics, S.Panigrahi & B. Mallick,2015, Cengage Learning India Pvt. Ltd.
4. Practical Physics, G.L. Squires, 2015, 4th Edition, Cambridge University Press
5. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn, 201, Kitab Mahal.
6. B Sc. Practical Physics, C. L. Arora, S. Chand & Co.
7. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

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Shaheed Bhagat Singh State University, Ferozepur
B.Sc (Non-Medical) Batch 2022 onwards

Semester – 5th

Course Name	**B.Sc (Non-Medical)**
Subject Code	**BSNM-501C**
Subject Title	**Physical Chemistry - III**
Contact Hours	**L:3 ; T:0 : P:0**
Credits	**3**

Unit	Contents
I **10 Hrs**	**Electrochemistry-I** Electrical transport-conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of equivalent and specific conductance with dilution. Migration of ions and Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf method and moving boundary method. Applications of conductivity measurements: determination of degree of dissociation, determination of Ka of acids, determination of solubility product of a sparingly soluble salt, conductometric titrations.
II **13 Hrs**	**Electrochemistry** – II Types of reversible electrodes-gas metal ion, metal ion, metal insolblue salt-anion and redox electrodes. Electrode reactions. Nernst equation, derivation of cell E.M.F. and Single electrode potential, standard hydrogen electrode, reference electrodes, standard electrode potential, sign conventions, electrochemical series and its significance. Electrolytic and Galvanic cells-reversible and irreverisible cells, conventional representation of electrochemi cells. EMF of a cell and its measurements. Computation of cell. EMF, Calculation of thermodynamic quantities of cell reactions (ΔG ΔH and K), polarization, over potential and hydrogen overvoltage. Concentration cells with and without transport, liquid junction potential, application of concentration cells, valency of ions, solubility product and activity coefficient, potentiometric titrations. Definition of pH and pKa, determination of pH using hydrogen, quinhydrone and glass electrodes, by potentiometric methods. Buffers-mechanism of buffer action, Henderson-Hazel equation, Hydrolysis of salts. Corrosion-types, theories and methods of combating it.
III **12 Hrs**	**Nuclear Chemistry** Introduction: Radioactivity, Nuclear Structure, Size of Nucleus, Mass Defects and Binding Energy, Nuclear Stability, Nuclear Forces, Nuclear Spin and Moments of Nuclei, Nuclear Models, Nuclear Decay Processes, The Laws of Radioactive Decay, Soddy-Fajans Group Displacement Law, Rate of Nuclear Decay and Half Life Time (Kinetics of Radioactive Decay), Induced Nuclear Reactions, Types of Nuclear Processes, High Energy Nuclear Reactions, Nuclear Reaction Cross-Section, Artificial radioactivity, Detection and Measurement of Radioactivity, Nuclear Fission, Nuclear Fusion, Applications of Radioactivity.

IV 10 Hrs	**Spectroscopy** Introduction: Electromagnetic radiation, regions of the spectrum, basic features of different spectrometers, statement of the Born-Oppenheimer approximation, degrees of freedom. **Rotational Spectrum** Diatomic molecules. Energy levels of a rigid rotor (semiclassical principles), selection rules, spectral intensity, distribution using population distribution (Maxwell-Boltzmann distribution) determination of bond length, qualitative description of non-rigid rotor, isotope effect. **Vibrational Spectrum** Infrared spectrum: Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies, effect of anharmonic motion and isotope on the spectrum, idea of vibrational frequencies of different functional groups. Raman Spectrum: Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules. **Electronic Spectrum** Concept of potential energy curves for bonding and antibonding molecular orbitals, qualitative description of selection rules and Franck-Condon principle. Qualitative description of s, p, and n M.O., their energy levels and the respective transitions.
	Recommended Books: 1. Thermodynamics for Chemists, S. Glasstone. 2. R.S.Drago, "Physical Methods in Chemistry". 3. Principles of Physical Chemistry, S.H. Maron & C.F. Prutton. 4. Physical Chemistry, P.W. Atkins. 5. G.M. Barrow "Introduction to Molecular Spectroscopy". 6. C.N. Banwell "Fundamentals of Molecular Spectroscopy 7. Concise Inorganic Chemistry by J.D. Lee, Oxford; Fifth edition

Shaheed Bhagat Singh State University, Ferozepur
B.Sc (Non-Medical) Batch 20__ onwards

Semester – 5th

Course Name	B.Sc (Non-Medical)
Subject Code	BNM-502
Subject Title	Inorganic Chemistry – IV
Contact Hours	L:5 : T:1 : P:1
Credits	5

Unit	Contents
I 10 Hrs	**Metal-ligand Bonding in Transition Metal Complexes** Valence bond theory, Limitations of valence bond theory, an elementary idea of crystal-field theory, crystal field splitting in octahedral, tetrahedral and square planar complexes, factors affecting the crystal-field parameters.
II 12 Hrs	**Magnetic Properties of Transition Metal Complexes** Types of magnetic behaviour, methods of determining magnetic susceptibility, spin-only formula, L-S coupling, correction of μs and μ0 values, orbital contribution to magnetic moments, applications of magnetic moment data for characterization of 3d-metal complexes.
III 12 Hrs	**Thermodynamic and Kinetic Aspects of Metal Complexes** A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, substitution reactions of square planar complexes. **Electronic Spectra of Transition Metal Complexes** Term Symbols for p2 & d2 systems, spectroscopic ground states for d1-d10 electronic configurations. Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, Orgel diagram for d1-d9.
IV 11 Hrs	**Organometallic Compounds** Definition, nomenclature and classification of organometallic compounds, EAN rule, Preparation, properties, and applications of alkyls and aryls of lithium and aluminium, Bonding in metal-ethylenic complexes, Mechanism of homogeneous hydrogenation reactions.
	Recommended Books: 1. J.E. Huheey, Inorganic Chemistry Principles of Structure and Reactivity, Harper InterScience. 2. R.S. Drago, Physical Method in Chemistry, W.B. Saunders Company. 3. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, Wiley Inter-science. 4. A. Earnshaw, Introduction to Magnetochemistry, Academic Press.

Shaheed Bhagat Singh State University, Ferozepur
B.Sc (Non-Medical) Batch 2022 onwards

Semester – V

Course Name	**B.Sc (Non-Medical)**
Subject Code	**BSNM-509C**
Subject Title	**Chemistry Lab - V**
Contact Hours	**L:0 ; T:0 : P:4**
Credits	**2**

Details of the course:

I) Synthesis and Analysis

(a) Preparation of Sodium trioxalatoferrate(III)
(b) Preparation of Ni-DMG Complex
(c) Preparation of Copper tetrammine complex
(d) Preparation of cis-bisoxalatodiaquachromate(III)ion

(II) Physical Chemistry

(a) Conductometric Titrations

(i) Determine the end point of the following titrations by the conductometric methods.
Strong acid-Strong base
Strong acid-Weak base
Weak acid-Strong base
Weak acid-Weak base
(ii) Determine the composition of a mixture of acetic acid and the hydrochloric acid by conductometric titration.
b.(i) Molecular Weight Determination of acetanilide, napthalane, using camphor as solvent (Rast's methods).
(ii) To determine the molecular weight of a polymer by viscosity measurements.

(c) Adsorption: To study the adsorption of acetic acid oxalic/acid from aqueous solutions by charcoal.

(d) Phase Equilibria: To determine the distribution coefficient of iodine between CCl_4 and water.

(e) Refractometry:

(i) Determination of refractive index of a liquid by Abbe refractometer, and hence the specific and molar refraction.
(ii) To determine the composition of unknown mixture of two liquids by refractive index measurements.

Reference books

1. Practical Inorganic Chemistry by J.R. Barrante G. Marr and B.W. Rockett
2. Vogel's Inorganic Quantitative Analysis
3. Advanced Practical Physical Chemistry by J.B. Jadav.

Shaheed Bhagat Singh State University, Ferozepur
B.Sc (Non-Medical) Batch 2022 onwards

Semester – VI

Course Name	**B.Sc (Non-Medical)**
Subject Code	**BSNM-601C**
Subject Title	**Organic Chemistry - IV**
Contact Hours	**L:3 ; T:0 : P:0**
Credits	**3**

Unit	Contents
I **11 Hrs**	**Spectroscopy** Nuclear Magnetic Resonance (NMR) spectroscopy. Proton Magnetic Resonance (1H NMR) spectroscopy, nuclear shielding and deshielding, chemical shift and molecular structure, spin-spin splitting and coupling constants, areas of signals, interpretation of PMR spectra of simple organic molecules such as ethyl bromide, ethanol, acetaldehyde, 1,1,2tribromoethane, ethyl acetate, toluene and acetophenone. **Electromagnetic Spectrum: Absorption Spectroscopy** **Ultraviolet (U.V.) absorption spectroscopy** Introduction- (Beer-Lambert law), molar absorptivity, analysis of UVspectra, types of electronic transitions effect of conjugation. Concept of chromophores and auxochrome, Bathochrome, hypsochrome, hyperchrome, hypochromic shifts-UV spectra of conjugated compounds, Infrared (IR) Absorption spectroscopy-introduction, Hooke's law, Selection rules, intensity and IR bands, measurement of IR spectrum time characteristic absorption of various fundamental band interpretation of IR spectra of simple organic compounds.
II **12 Hrs**	**Problems based on spectroscopy** Problems pertaining to the structure elucidation of simple organic compounds using UV, IR and PMR spectroscopic techniques. **Synthetic Polymers** Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler-Natta polymerization and vinyl polymers. Condensation or step growth polymerization. Polyesters, polyamides, phenol formaldehyde resins, urea formaldehyde resins, epoxy resins and polyurethanes. Natural and synthetic rubbers
III **12 Hrs**	**Organosulphur Compounds** Nomenclature, structural features, Methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides and sulphaguanidine. **Organic Synthesis via Enolates** Acidity of α-hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate. Alkylation of 1,3-dithianes. Alkylation and acylation of enamines.
IV **10 Hrs**	**Carbohydrates** Classification and nomenclature. Monosaccharides, mechanism of osazone formation, interconversion of glucose and fructose, chain lengthening and chain shortening of aldoses. Configuration of monosaccharides. Erythro and threo diastereomers. Conversion of glucose into mannose. Formation of glycosides,

	ethers and esters. Determination of ring size of monosaccharides. Cyclic structure of D(+)-glucose. Mechanism of mutarotation. Structures of ribose and deoxyribose An introduction to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination. **Amino Acids, Peptides, Proteins and Nucleic Acids** Classification, structure and stereochemistry of amino acids. Acid-base behaviour, isoelectric point and electrophoresis. Preparation and reactions of α-amino acids. Structure and nomenclature of peptides and proteins. Classification of proteins. Peptide structure determination, end group analysis, selective hydrolysis of peptides. Classical peptide synthesis, solid-phase peptide synthesis. Structures of peptides and proteins. Levels of protein structure. Protein denaturation/renaturation. Nucleic acids: Introduction. Constituents of nucleic acids. Ribonucleosides and ribonucleotides. The double helical structure of DNA.
	Recommended Books: 1. Organic Chemistry, Morrison and Boyd, Prentice Hall 2. R.M. Silverstein, G.C. Bassler, T.C. Morrill, "Spectrometic Identification of Organic Compounds. 3. W. Kemp, "Organic Spectroscopy". 4. D.H. Williams, I. Fleming, "Spectroscopic Methods in Organic Chemistry". 5. Organic Chemistry. F.A. Carey, McGraw Hill, Inc. 8th edition. 6. J.R.Dyer, "Application of Absorption Spectroscopy of Organic Compounds". 7. D. H. Williams, I. Fleming, "Spectroscopic Problems in Organic Chemistry" 1967.

Shaheed Bhagat Singh State University, Ferozepur
B.Sc (Non-Medical) Batch 2022 onwards

Semester – VI

Course Name	**B.Sc (Non-Medical)**
Subject Code	**BSNM-602C**
Subject Title	**Physical Chemistry - IV**
Contact Hours	**L:3 ; T:0 : P:0**
Credits	3

Details of the course:

Unit	Contents
I 12 Hrs	**Quantum Mechanics** Black-body radiation, Planck's radiation law, Photoelectric effect, heat capacity of solids, Bohr's model of hydrogen atom (no derivation) and its defects, Compton effect. de Broglie hypothesis, Heisenberg's uncertainty principle, Sinusoidal wave equation, Hamiltonian operator, Schrodinger wave equation and its importance, physical interpretation of the wave function, postulates of quantum mechanics, particle in a one dimensional box, quantization of energy levels, extension to two and three dimensional boxes, degeneracy.
II 10 Hrs	**Solid State** Definition of space lattice and unit cell, Law of crystallography- (i) Law of constancy of interfacial angles, (ii) Law of rationality of indices, (iii) Symmetry elements in crystals. X-ray diffraction by crystals. Derivation of Bragg's Law in Reciprocal space. Determination of crystal structure of NaCl, KCl by use of Powder method; Laue's method.
III 11 Hrs	**Photochemistry** Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grothus–Drapper law, Stark–Einstein law, Jablonski diagram depicting various processes occurring in the excited state, qualitative description of flourescence, phosphorescence, non–radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions–energy transfer processes (simple examples).
IV 10 Hrs	**Green Chemistry** Definition of green chemistry and its difference from conventional chemistry and environmental chemistry., Need of green chemistry, The twelve principles of the Green Chemistry with their explanations, Surfactants for carbon dioxide – replacing smog producing and ozone depleting solvents with CO_2 for precision cleaning and dry cleaning of garments.
	Recommended Books: 1. . Quantum Chemistry, Ira N. Levine. 2. Quantum Chemistry, H. Eyring J. Walter and G.E. Kimball. 3. Green Chemistry: Theory and Practice; Anastas, P. T.; Warner,

	J. C. Oxford University 4. Physical Methods in Chemistry, R.S.Drago. 5. Fundamentals of Photochemistry, K.K.Rastogi

Shaheed Bhagat Singh State University, Ferozepur
B.Sc (Non-Medical) Batch 2022 onwards

Semester – VI

Course Name	**B.Sc (Non-Medical)**
Subject Code	**BSNM-609C**
Subject Title	**Chemistry Lab - VI**
Contact Hours	**L:0 ; T:0 : P:4**
Credits	**2**

Details of the course:

(I) Organic Chemistry Laboratory Techniques

(a) Column Chromatography

Separation of o & p-nitrophenol

Separation of o & p-nitroaniline

Separation of Leaf pigments from Spinnach leaves

Separation of o & p-nitro aniline Separation of dyes

(b) Synthesis of Organic Compounds

Preparation of p-nitroacetanilide

Preparation of p-bromoacetanilide

Preparation of benzilic acid from Benzyl-using green approach.

Preparation of Methyl Orange, Methyl Red

Preparation of benzilic acid from benzyl-using green approach

Reference books

1. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.

2. Practical Organic Chemistry by F.G. Mann and B.C. Saunders

3. Experimental Organic Chemistry, Vol. I & II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill.

4. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSNM-505C			
Subject Title:	Probability Theory			
Contact Hours:	L:3	T:0	P:0	Credits:3

Details of the

Course Objectives This course is designed to introduce theory of probability. The main focus of the course will be on the notions and uses of probability, random variables and probability distributions.

Unit	Content
I	Random experiment, sample space, event, algebra of events, Probability definition, addition law of probability, multiplication law of probability, conditional probability and independence, Bayes' Theorem
II	Random variables, Geometrical distribution, distribution function, properties of distribution function, discrete randomvariable, probability mass function, discrete distribution function, continuous random variable, probability density function. Continuous distribution function.
III	Moment generating function (M.G.F), Joint distribution, Mathematical expectation, expectation of random variable, Discrete probabilitydistributions: Binomial, Poisson, Negative Binomial distribution.
IV	Continuous probability distributions: Normal distribution, normal distribution as a limiting case of binomial distribution.
	Recommended Books: 1. S. Ross, A First Course in Probability, Pearson, 2008. 2. S.C. Gupta, V. K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand & Sons, Delhi, 2014.

Course Outcomes: After completion of the course, the students will be able to understand and demonstrate the notion of randomness. Apply the concepts of probability in modeling processes and decision making.

Asstt. Regt. P. Agnihotri

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSNM-506C			
Subject Title:	Modern Algebra			
Contact Hours:	L:3	T:0	P:0	Credits:3

Details of the

- **Course Objectives** This course is designed to introduce the basic concepts of modern algebra. The main focus of the course will be on the notions of algebraic structures, groups and rings.

Unit	Content
I	Groups, Abelian Group, Finite and Infinite Groups, Order of a Group, Modulo Group, Addition Modulo m, Multiplication Modulo p, Properties of group elements.
II	Subgroups, cyclic groups, Cosets of a subgroup, Lagrange's theorem, normal subgroups and Quotient groups
III	Homomorphism, Isomorphism theorems, conjugate elements, class equation, permutation groups, alternating groups
IV	Rings, subring, characterization of a subring, integral domains, ideals, characteristic of a ring, Quotient rings.
	Recommended Books: 1. L. Gilbert, J. Gilbert, Elements of Modern Algebra, Cengage, 2015. 2. M. Artin, Algebra, Pearson, 2010. 3. Singh, Surjeet, and Qazi Zameeruddin. *Modern Algebra*. Vikas Publishing House PVT Limited, 1994. 4. Herstein, Israel Nathan. *Topics in algebra*. John Wiley & Sons, 1991.

Course Outcomes After completion of the course, the students will be able to

1. Deal with algebraic structures and their use in proving theorems/results
2. Demonstrate the abstract concepts of groups and rings.

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSNM-605C			
Subject Title:	Numerical Methods			
Contact Hours:	L:3	T:0	P:0	Credits:3

Course Objectives This course is designed to introduce basic concepts of numerical analysis. The main objective of the course is to introduce the methods for solving problems numerically which are difficult to deal with analytically.

Unit	Content
I	Linear System of Equations: Gauss elimination method, Gauss Jordan method, LU decomposition method. Iterative Methods: Jacobi, Gauss-Seidel.
II	Interpolation: Interpolation with Unevenly Spaced Points: Lagrange Interpolation, Newton's Divided Difference Interpolation; Interpolation with Evenly Spaced Points: Newton's Forward Difference Interpolation Formula, Newton's Backward Difference Interpolation Formula.
III	Numerical Differentiation and Integration: Numerical differentiation: Newton's Forward Difference Formula, Newton's Backward Difference Formula, Newton's Divided Difference Formula. Numerical Integration: Trapezoidal rule, Simpson's 1/3-rule and Simpson's 3/8 rule.
IV	Numerical Solution of ordinary differential equation: Picard's Method, Euler's Method, Euler's Modified Method, Taylor Series Method, Runge-Kutta Method of 4^{th} order.
	Recommended Books: 1. Richard L. Burden and J. Douglas Faires, Numerical Analysis, 9th Edition, Cengage Learning, 2012. 2. M. K. Jain, S. R. K. Iyengar and R. K. Jain, Numerical Methods for Scientific and Engineering Computation, 6th Edition, New Age International Publisher, 2012. 3. Grewal, B. S., and J. S. Grewal. "Higher engineering mathematics." *2002, Khanna Publishers, New Delhi* (1996). 4. Chapra, Steven C. Applied numerical methods. Columbus: McGraw-Hill, 2012.

Course Outcomes After completion of the course, the students will be able to

1. Analyze and solve different types of problems numerically arising in various fields of applications.
2. Use different numerical methods for solving problems with the understating of their limitations

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSNM-606C			
Subject Title:	Statistical Methods			
Contact Hours:	L:3	T:0	P:0	Credits:3

Course Objectives: The objective of this course is to familiarize the student with statistical techniques. It aims to equip he students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline.

Unit	Content
I	Measures of central tendency, namely, Arithmetic mean, median, mode, Geometric mean, Harmonic mean.
II	Range, mean deviation, quartile deviation and standard deviation. Advantages of standard deviation as measure of dispersion over the other measures,
III	Dispersion and its measures. Relative measures of dispersion, coefficient of variation. Skewness and its measures, Kurtosis and its measures.
IV	Correlation and regression for bivariate data, Rank correlation, Curve fitting by the method of least square, fitting of straight lines , second degree parabolas and more general curve.
	Recommended Books: 1. Gupta, S.C. and Kapoor, V.K.: Fundamentals of Mathematical Statistics, Sultan Chand and Company, 2007 2. Croxton F.E., Cowden, D.J. and Kelin, S. (1973): Applied General Statistics, Prentice Hall of India. 3. Goon, A.M. Gupta, M.K. and Dasgupta B.: Fundamentals of Statistics, Vol. I, World Press, 2005. **Supplementary Reading:** 1. Goon, A.M. Gupta, M.K. and Dasgupta B.: Basic Statistics, World Press, 2005. 2. Gupta, S.C.: Statistical Methods, Himalayan Publishing House, 2003. 3. Nagar, A.L. and Das, R.K., Basic Statistics, Oxford University Press, 2005.

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

1. Apply the formula and calculate descriptive measures of statistics.
2. Analyze the nature of data and interpret the measures
3. Identify the appropriate measure of central tendency and dispersion for a particular situation, and Interpret the problems based on measures of central tendency and measures of dispersion.
4. Analyze the data and predict the future values using curve fitting.
5. Describe how correlation is used to identify relationships between variables and to describe how regression analysis is used to predict outcomes

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSNM-505C			
Subject Title:	Probability Theory			
Contact Hours:	L:3	T:0	P:0	Credits:3

Details of the
Course Objectives This course is designed to introduce theory of probability. The main focus of the course will be on the notions and uses of probability, random variables and probability distributions.

Unit	Content
I	Random experiment, sample space, event, algebra of events, Probability definition, addition law of probability, multiplication law of probability, conditional probability and independence, Bayes' Theorem
II	Random variables, Geometrical distribution, distribution function, properties of distribution function, discrete randomvariable, probability mass function, discrete distribution function, continuous random variable, probability density function. Continuous distribution function.
III	Moment generating function (M.G.F), Joint distribution, Mathematical expectation, expectation of random variable, Discrete probabilitydistributions: Binomial, Poisson, Negative Binomial distribution.
IV	Continuous probability distributions: Normal distribution, normal distribution as a limiting case of binomial distribution.
	Recommended Books: 1. S. Ross, A First Course in Probability, Pearson, 2008. 2. S.C. Gupta, V. K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand & Sons, Delhi, 2014.

Course Outcomes: After completion of the course, the students will be able to understand and demonstrate the notion of randomness. Apply the concepts of probability in modeling processes and decision making.

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSNM-506C			
Subject Title:	Modern Algebra			
Contact Hours:	L:3	T:0	P:0	Credits:3

Details of the

Course Objectives This course is designed to introduce the basic concepts of modern algebra. The main focus of the course will be on the notions of algebraic structures, groups and rings.

Unit	Content
I	Groups, Abelian Group, Finite and Infinite Groups, Order of a Group, Modulo Group, Addition Modulo m, Multiplication Modulo p, Properties of group elements.
II	Subgroups, cyclic groups, Cosets of a subgroup, Lagrange's theorem, normal subgroups and Quotient groups
III	Homomorphism, Isomorphism theorems, conjugate elements, class equation, permutation groups, alternating groups
IV	Rings, subring, characterization of a subring, integral domains, ideals, characteristic of a ring, Quotient rings.
	Recommended Books: 1. L. Gilbert, J. Gilbert, Elements of Modern Algebra, Cengage, 2015. 2. M. Artin, Algebra, Pearson, 2010. 3. Singh, Surjeet, and Qazi Zameeruddin. *Modern Algebra*. Vikas Publishing House PVT Limited, 1994. 4. Herstein, Israel Nathan. *Topics in algebra*. John Wiley & Sons, 1991.

Course Outcomes After completion of the course, the students will be able to

1. Deal with algebraic structures and their use in proving theorems/results
2. Demonstrate the abstract concepts of groups and rings.

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSNM-605C			
Subject Title:	Numerical Methods			
Contact Hours:	L:3	T:0	P:0	Credits:3

Course Objectives This course is designed to introduce basic concepts of numerical analysis. The main objective of the course is to introduce the methods for solving problems numerically which are difficult to deal with analytically.

Unit	Content
I	Linear System of Equations: Gauss elimination method, Gauss Jordan method, LU decomposition method. Iterative Methods: Jacobi, Gauss-Seidel.
II	Interpolation: Interpolation with Unevenly Spaced Points: Lagrange Interpolation, Newton's Divided Difference Interpolation; Interpolation with Evenly Spaced Points: Newton's Forward Difference Interpolation Formula, Newton's Backward Difference Interpolation Formula.
III	Numerical Differentiation and Integration: Numerical differentiation: Newton's Forward Difference Formula, Newton's Backward Difference Formula, Newton's Divided Difference Formula. Numerical Integration: Trapezoidal rule, Simpson's 1/3-rule and Simpson's 3/8 rule.
IV	Numerical Solution of ordinary differential equation: Picard's Method, Euler's Method, Euler's Modified Method, Taylor Series Method, Runge-Kutta Method of 4^{th} order.
	Recommended Books: 1. Richard L. Burden and J. Douglas Faires, Numerical Analysis, 9th Edition, Cengage Learning, 2012. 2. M. K. Jain, S. R. K. Iyengar and R. K. Jain, Numerical Methods for Scientific and Engineering Computation, 6th Edition, New Age International Publisher, 2012. 3. Grewal, B. S., and J. S. Grewal. "Higher engineering mathematics." *2002. Khanna Publishers, New Delhi* (1996). 4. Chapra, Steven C. Applied numerical methods. Columbus: McGraw-Hill, 2012.

Course Outcomes After completion of the course, the students will be able to

1. Analyze and solve different types of problems numerically arising in various fields of applications.
2. Use different numerical methods for solving problems with the understating of their limitations.

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSNM-606C			
Subject Title:	Statistical Methods			
Contact Hours:	L:3	T:0	P:0	Credits:3

Course Objectives: The objective of this course is to familiarize the student with statistical techniques. It aims to equip he students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline.

Unit	Content
I	Measures of central tendency, namely, Arithmetic mean, median, mode, Geometric mean, Harmonic mean.
II	Range, mean deviation, quartile deviation and standard deviation. Advantages of standard deviation as measure of dispersion over the other measures,
III	Dispersion and its measures, Relative measures of dispersion, coefficient of variation. Skewness and its measures, Kurtosis and its measures.
IV	Correlation and regression for bivariate data, Rank correlation, Curve fitting by the method of least square, fitting of straight lines , second degree parabolas and more general curve.
	Recommended Books: 1. Gupta, S.C. and Kapoor, V.K.: Fundamentals of Mathematical Statistics, Sultan Chand and Company, 2007 2. Croxton F.E., Cowden, D.J. and Kelin, S. (1973): Applied General Statistics, Prentice Hall of India. 3. Goon, A.M. Gupta, M.K. and Dasgupta B.: Fundamentals of Statistics, Vol. I, World Press, 2005. **Supplementary Reading:** 1. Goon, A.M. Gupta, M.K. and Dasgupta B.: Basic Statistics, World Press, 2005. 2. Gupta, S.C.: Statistical Methods, Himalayan Publishing House, 2003. 3. Nagar, A.L. and Das, R.K., Basic Statistics, Oxford University Press, 2005.

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

1. Apply the formula and calculate descriptive measures of statistics.
2. Analyze the nature of data and interpret the measures
3. Identify the appropriate measure of central tendency and dispersion for a particular situation. and Interpret the problems based on measures of central tendency and measures of dispersion.
4. Analyze the data and predict the future values using curve fitting.
5. Describe how correlation is used to identify relationships between variables and to describe how regression analysis is used to predict outcomes

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Shaheed Bhagat Singh State University, Ferozepur

B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)			
Subject Code:	BSHU-502C			
Subject Title	PUNJABI-V			
Contact Hours:	L:3	T:0	P:0	Credits:3

ਪਾਠ ਕ੍ਰਮ:

ਯੂਨਿਟ -1 (ਸਾਹਿਤ)

1. ਡਾ. ਗੰਡਾ ਸਿੰਘ - ਪ੍ਰੋ. ਪ੍ਰੀਤਮ ਸਿੰਘ
2. ਨਾਨਕ ਸਿੰਘ - ਬਲਵੰਤ ਗਾਰਗੀ
3. ਬਾਬਾ, ਬੋਹੜ ਨਹੀਂ - ਭਗਵੰਤ ਸਿੰਘ
4. ਨਿੱਕੀ ਕਹਾਣੀ ਦਾ ਬਾਦਸ਼ਾਹ - ਅਜੀਤ ਕੌਰ
5. ਬਾਤਾ ਮੋਹਨ ਸਿੰਘ ਦੀਆ - ਕੁਲਬੀਰ ਸਿੰਘ ਕਾਂਗ
6. ਗੁਲਾਬੀ ਕਾਗਜ ਉੱਤੇ ਲਿਖੀ ਕਵਿਤਾ - ਸੰਤੋਖ ਧੀਰ - ਗੁਰਬਚਨ ਸਿੰਘ ਭੁੱਲਰ
7. ਸਤਿੰਦਰ ਸਿੰਘ ਨੂਰ - ਮਾਨਿਤ ਦਾ ਮਬੋਦਾਰ - ਗੁਰਬਚਨ
8. ਮਿਲਖਾ ਸਿੰਘ - ਸਰਵਣ ਸਿੰਘ

ਯੂਨਿਟ -2 (ਭਾਸ਼ਾ)

ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਚ ਅਨੁਵਾਦ ਦੀ ਪਰਿਭਾਸ਼ਾ
ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿੱਚ ਵਿਗਿਆਨਿਕ ਲਿਖਤਾਂ ਦਾ ਅਨੁਵਾਦ

ਯੂਨਿਟ -3 (ਵਿਆਕਰਣ)

ਪੰਜਾਬੀ ਵਿਆਕਰਣ ਵਿਕਾਸਿਆ : ਸਵਾਧੀਨ ਉਪਵਾਕ ਅਤੇ ਪਰਾਧੀਨ ਉਪਵਾਕ

ਯੂਨਿਟ- 4(ਲੇਖਣੀ - ਕਲਾ)

ਸਨੇਹੀਆ ਨੂੰ ਚਿੱਠੀ ਪੱਤਰ
ਪੋਸਟ ਕਾਰਡ ਲਿਖਣ ਦੀ ਵਿਧੀ ਤੇ ਨਮੂਨਾ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ: -

ਸਾਹਿਤ ਦੇ ਟੱਰਮ (ਸਪ. ਡਾ. ਮਹਿਲ ਸਿੰਘ), ਨਵੀਂ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ ਅੰਮ੍ਰਿਤਸਰ ।

ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ ਜੋਗਿੰਦਰ ਸਿੰਘ ਪਆਰ, ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਸਖਵਿੰਦਰ ਸਿੰਘ ਸੰਘਾ, ਵੇਦ ਅਗਨੀਹੋਤਰੀ) **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ , ਜਲੰਧਰ** ਐਡੀਸ਼ਨ 2009

ਅ ਦਾਰ ਅਧਿਐਨ: ਰਮੀਦ ਸੁਮੀਤ, ਆਉਟਮਨ ਆਫਸ, ਪਟਿਆਲਾ

Shaheed Bhagat Singh State University, Ferozepur

B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)
Subject Code:	BSHU-602C
Subject Title	PUNJABI-VI
Contact Hours:	L:3 | T:0 | P:0 | Credits:3

ਪਾਠ ਕ੍ਰਮ

ਯੂਨਿਟ-1 (ਸਾਹਿਤ)

1 [illegible] – [illegible] ਸਿੰਘ

2 [illegible] – ਪ੍ਰੋ. ਤੇਜਾ ਸਿੰਘ

3 [illegible] ਗੁਰਬਖਸ਼ ਸਿੰਘ ਪ੍ਰੀਤਲੜੀ

4 [illegible] – ਹਰਿੰਦਰ ਸਿੰਘ ਰੂਪ

5 [illegible] – ਸੂਬਾ ਸਿੰਘ

6 ਹਾਰ ਸ਼ਿੰਗਾਰ – ਗੁਲਜ਼ਾਰ ਸਿੰਘ ਸੰਧੂ

7 [illegible] – ਨਰਿੰਦਰ ਸਿੰਘ ਕਪੂਰ

8 [illegible] – ਹਰਪਾਲ ਸਿੰਘ ਪੰਨੂੰ

ਯੂਨਿਟ – 2 (ਭਾਸ਼ਾ)

ਵਿਗਿਆਨ ਵਿੱਚ ਵਰਤੀ ਜਾਣ ਵਾਲੀ ਸ਼ਬਦਾਵਲੀ ਅਤੇ ਉਸਦਾ ਪੰਜਾਬੀ ਅਨੁਵਾਦ

ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਪੰਜਾਬੀ ਅਨੁਵਾਦ

ਯੂਨਿਟ – 3 (ਵਿਆਕਰਣ)

ਪੰਜਾਬੀ ਵਿਆਕਰਣ [illegible] : [illegible] ਵਾਕੰਸ਼ ਤੇ ਕਿਰਿਆ ਵਾਕੰਸ਼ ।

ਯੂਨਿਟ – 4 (ਲੇਖਣੀ ਕਲਾ)

[illegible]

[illegible] ਲਿਖਣ ਦੀ ਵਿਧੀ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ :

[illegible] ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ ਅੰਮ੍ਰਿਤਸਰ ।

ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ [illegible] ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ ਸੁਖਵਿੰਦਰ ਸਿੰਘ ਸੰਘਾ [illegible]), ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ, ਜਲੰਧਰ, [illegible] 2009

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Shaheed Bhagat Singh State University, Ferozepur

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B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)			
Subject Code	BSHU-502C			
Subject Title	PUNJABI-V			
Contact Hours:	L:3	T:0	P:0	Credits:3

ਯੂਨਿਟ -1 (ਗਦ)

ਯੂਨਿਟ -2 (ਭਾਸ਼ਾ)

ਹਿੰਦੀ ਪੈਰਾ ਵਿਚ ਅਨੁਵਾਦ ਦਾ ਪ੍ਰੀਖਣ
ਹਿੰਦੀ ਪੈਰਾ ਵਿੱਚ ਦਿੱਤੇ ਇੰਗਲਿਸ਼ ਲਿਖਤ ਦਾ ਅਨੁਵਾਦ

ਯੂਨਿਟ -3 (ਵਿਆਕਰਣ)

ਪੈਰਾ ਦੇ ਵਿਆਕਰਣ ਵਿਸ਼ਲੇਸ਼ਣ : ਸ਼ਬਦਾਂਸ਼ ਉਪਵਾਕ ਅਤੇ ਪਦਾਂਸ਼ ਉਪਵਾਕ

ਯੂਨਿਟ- 4(ਲੇਖਣੀ - ਕਲਾ)

ਪੁਸਤਕ ਪੜਚੋਲ

1

Shaheed Bhagat Singh State University, Ferozepur

B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non Medical)
Subject Code:	BSHU-602C
Subject Title	PUNJABI-VI
Contact Hours:	L:3 | T:0 | P:0 | Credits:3

[illegible]

ਯੂਨਿਟ-1 (ਸਹਿਤ)

[illegible] – [illegible] ਸਿੰਘ
2. [illegible] – ਪ੍ਰਿੰ. ਤੇਜਾ ਸਿੰਘ
3. [illegible] ਸਿੰਘ ਪ੍ਰੀਤਲੜੀ
[illegible] – [illegible] ਸਿੰਘ ਦੁੱਗਲ
[illegible] – [illegible] ਸਿੰਘ
[illegible] – [illegible] ਸਿੰਘ ਸੰਧੂ
[illegible] – [illegible] ਸਿੰਘ ਕਪੂਰ
[illegible] – [illegible] ਸਿੰਘ [illegible]

ਯੂਨਿਟ – 2 (ਭਾਸ਼ਾ)

[illegible] ਸ਼ਬਦਾਵਲੀ ਅਤੇ ਉਚਾਰਣ ਪੰਜਾਬੀ ਅਨੁਵਾਦ
[illegible]

ਯੂਨਿਟ – 3 (ਵਿਆਕਰਣ)

[illegible] ਵਾਕ ਤੇ ਮਿਸ਼ਰਿਤ ਵਾਕ ।

ਯੂਨਿਟ – 4 (ਲੇਖਣੀ ਕਲਾ)

[illegible]
[illegible]

[illegible] ਪੁਸਤਕਾਂ :
[illegible] ([illegible]), ਨਵੀਂ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ ਅੰਮ੍ਰਿਤਸਰ ।
[illegible] ਅਨੁਵਾਦ [illegible] ਸਿੰਘ [illegible] ਸਿੰਘ [illegible] ਸਿੰਘ [illegible]), ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ ਜਲੰਧਰ.
[illegible] 2005

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Shaheed Bhagat Singh State University, Ferozepur

B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)			
Subject Code:	BSHU-502C			
Subject Title	PUNJABI-V			
Contact Hours:	L:3	T:0	P:0	Credits:3

ਪਾਠ ਕ੍ਰਮ:

ਯੂਨਿਟ -1 (ਸਾਹਿਤ)

1. ਡਾ. ਗੰਡਾ ਸਿੰਘ - ਪ੍ਰੋ. ਪ੍ਰੀਤਮ ਸਿੰਘ
2. ਨਾਨਕ ਸਿੰਘ - ਬਲਵੰਤ ਗਾਰਗੀ
3. ਬਾਬਾ, ਬੋਹੜ ਨਦੀ - ਭਗਵੰਤ ਸਿੰਘ
4. ਨਿੰਮੀ ਕਹਾਣੀ ਦਾ ਬਾਦਸ਼ਾਹ - ਅਜੀਤ ਕੌਰ
5. ਮਾੜਾ ਮਹੁਨ ਸਿੰਘ ਰਮਿਆ - ਕੁਲਬੀਰ ਸਿੰਘ ਕਾਂਗ
6. ਗਲਾਚੀ ਕਾਗਜ਼ ਉੱਤੇ ਲਿਖੀ ਕਵਿਤਾ - ਸਤੇਖ ਧੀਰ - ਗੁਰਬਚਨ ਸਿੰਘ ਭੁੱਲਰ
7. ਸਤਿੰਦਰ ਸਿੰਘ ਨੂਰ - ਸਾਹਿਤ ਦਾ ਜਰੂਰੀ ਹੈ - ਗੁਰਬਚਨ
8. ਮਿਲਾਪ ਸਿੰਘ - ਮਲਵਾਣ ਸਿੰਘ

ਯੂਨਿਟ -2 (ਭਾਸ਼ਾ)

ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਚ ਅਨੁਵਾਦ ਦੀ ਪਰਿਭਾਸ਼ਾ
ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿੱਚ ਪੈਰਿਗ੍ਰਾਫਿਕ ਲਿਖਤ ਦਾ ਅਨੁਵਾਦ

ਯੂਨਿਟ -3 (ਵਿਆਕਰਣ)

ਪੰਜਾਬੀ ਵਿਆਕਰਣ ਵਿਕਾਸਧਾਰਾ : ਸਵਾਧੀਨ ਉਪਵਾਕ ਅਤੇ ਪਰਾਧੀਨ ਉਪਵਾਕ

ਯੂਨਿਟ- 4(ਲੇਖਣੀ - ਕਲਾ)

ਮਸੌਦੇਆਂ ਨੂੰ ਚਿੰਨੀ ਪੰਜਾਬ
ਪੰਜਾਬ ਕਾਰਡ ਲਿਖਣ ਦੀ ਵਿਧੀ ਤੇ ਨਮੂਨਾ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

ਸਾਹਿਤ ਦੇ ਰੂਪ (ਸੰਪਾ. ਡਾ. ਮਹਿਲ ਸਿੰਘ), ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ ਅੰਮ੍ਰਿਤਸਰ |

ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨਿਕ ਸੰਰਚਿਤ ਸਿੰਘ ਪਆਪ ਬਲਦੇਵ ਸਿੰਘ ਰੰਮਾ, ਸਖਵਿੰਦਰ ਸਿੰਘ ਸੰਘਾ, ਵੇਦ ਅਗਨੀਹੋਤਰੀ) **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਕਾਦਮੀ , ਜਲੰਧਰ** ਅੰਤਿਮ 2009

ਅਨੁਵਾਦ ਦੇ ਅਧਿਐਨ: ਕੁਮਾਰ ਸੁਸ਼ਾਂਤ, ਯਾਦਵੇਂਦਰ ਪਬਲੀਕੇਸ਼ਨ, ਪਟਿਆਲਾ

J.n.2.Rec'd Engineer Kaur

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Shaheed Bhagat Singh State University, Ferozepur

B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)			
Subject Code:	BSHU-602C			
Subject Title	PUNJABI-VI			
Contact Hours:	L:3	T:0	P:0	Credits:3

ਪਾਠ ਕ੍ਰਮ:

ਯੂਨਿਟ-1 (ਸਹਿਤ)

1 ਜਿਓਣ – ਪ੍ਰੋ. ਪੂਰਨ ਸਿੰਘ

2 ਗੰਗਾ ਦੀਨ – ਪ੍ਰਿ. ਤੇਜਾ ਸਿੰਘ

3 ਮਾ- ਗੁਰਬਖਸ਼ ਸਿੰਘ ਪ੍ਰੀਤਲੜੀ

4 ਲਾਲ ਬਾਦਸ਼ਾਹ – ਹਰਿੰਦਰ ਸਿੰਘ ਰੂਪ

5 ਜਿਹੜੇ ਬੂਹੇਆ ਮੱਤੀਆ ਚੰਘਦੇ ਸੀ – ਸੁਭਾ ਸਿੰਘ

6. ਹਾਰ ਸ਼ਿੰਗਾਰ – ਗੁਲਜਾਰ ਸਿੰਘ ਸੰਧੂ

7 ਡੁੱਬੀਆ ਸਿਖਰਾ – ਨਰਿੰਦਰ ਸਿੰਘ ਕਪੂਰ

8 ਭਾਈ ਮਰਦਾਨਾ ਜੀ – ਹਰਪਾਲ ਸਿੰਘ ਪੰਨੂ

ਯੂਨਿਟ – 2 (ਭਾਸ਼ਾ)

ਵਿਗਿਆਨ ਵਿਚ ਵਰਤੀ ਜਾਣ ਵਾਲੀ ਸ਼ਬਦਾਵਲੀ ਅਤੇ ਉਸਦਾ ਪੰਜਾਬੀ ਅਨੁਵਾਦ
ਗਲਤੀਨੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਪੰਜਾਬੀ ਅਨੁਵਾਦ

ਯੂਨਿਟ – 3 (ਵਿਆਕਰਣ)

ਪੰਜਾਬੀ ਵਿਆਕਰਣ ਪ੍ਰਕਰਣੀਆ : ਨਾਵ ਵਾਕੰਸ਼ ਤੇ ਕਿਰਿਆ ਵਾਕੰਸ਼ ।

ਯੂਨਿਟ – 4 (ਲੇਖਣੀ ਕਲਾ)

ਅਖਬਾਰੀ ਲੇਖ
ਪੱ – ਪੱਤਰ ਲਿਖਣ ਦੀ ਵਿਧੀ

ਸਹਾਇਕ ਪੁਸਤਕਾ :

ਸਾਹਿਤ ਦੇ ਰੂਪ (ਸੰਪ. ਡਾ.ਸੀਲ ਸਿੰਘ), ਹਵੀ ਸਹਿਤ ਪ੍ਰਕਾਸ਼ਨ ਅੰਮ੍ਰਿਤਸਰ ।

ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਵਿਆਕਰਨ ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਦ, ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਸੁਖਵਿੰਦਰ ਸਿੰਘ ਸੰਘਾ, ਵੇਦ ਅਗਨੀਹੋਤਰੀ), ਪੰਜਾਬੀ ਭਾਸਾ ਅਕਾਦਮੀ, ਜਲੰਧਰ. ਐਡੀਸ਼ਨ 2009.

Jaswinder Kaur Gill

Shaheed Bhagat Singh State University, Ferozepur

B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)				
Subject Code:	BSHU-503C				
Subject Title	Punjab History & Culture-V				
Contact Hours:	L:3	T:0	P:0	Credits:3	

Unit	Content
I	Economy: Development of Resources: Transport and Communication, Agriculture; Industry, Trade and Commerce, Education.
II	Society and Culture: Aristocracy, Middle Classes, Artisans, Agricultural Labourers: Social Religious Reformers; Great Scientists of Punjab
III	National Movement: Early Nationalist Activities, Agrarian Agitation Of 1907, Ghadar Movement; Gandhian Movements.
IV	Naujwan Bharat Sabha; Hindustan Socialist Republican Association. The Akali Movement (1920-25), Jallianwala Bagh Massacre
	ReferenceBooks: 1. Badan Powell, B.H.,The Land System of British India, II, Oriental Publishers, 1974(reprint). 2. Bal, S.S., A Brief History of the Modern Punjab, Lyall Book Depot, Ludhiana, 1974. 3. Banga Indu,Five Punjabi Centuries: Essays for Dr. J.S. Grewal Manohar, New Delhi 1997. 4. Banerjee, Himadri ,Agrarian Society of the Punjab, 1849-1901 Manohar Book Service, New Delhi 1982. 5. Barrier, N.G, The Sikhs and their Literature, Manohar Books Service, Delhi 1970.

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Shaheed Bhagat Singh State University, Ferozepur

B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)			
Subject Code:	BSHU-603C			
Subject Title	Punjab History & Culture-VI			
Contact Hours:	L:3	T:0	P:0	Credits:3

Unit	Content
I	Partition and Rehabilitation, Punjabi Suba and Territorial Reorganization & Green Revolution.
II	Agrarian Crisis, Punjab Politics, Demographic Changes and Urbanization.
III	Centre–State Relations and the Punjab Crisis, Militancy/ Terrorism: Emergence and Impact; Drug addiction, Unemployment
IV	Punjabi Diaspora and Future Perspectives of Punjab: Economy, Politics, Culture and Society
	ReferenceBooks: 1. Grewal, J.S.,The Sikhs of the Punjab, CUP, Cambridge, 1990. 2. Grewal, J.S., and Indu Banga (eds.), Punjab in Prosperity and Violence: Administration, Politics and Social Change (1947-97), K.K. Publishers, Chandigarh 1998. 3. Banga, Indu (ed.), Five Punjabi Centuries: Polity, Economy, Society and Culture c. 1500- 1990: Essays for J.S.Grewal, Manohar, New Delhi,1997. 4. Puri, Harish K. Paramjit Singh Judge and Jagroop Singh Sekhon, "Terrorism in Punjab : Understanding Reality at the Grass roots Level",Guru Nanak Journal of Sociology,Vol. XVIII No.I, G.N. D. U., Amritsar, 1997, pp. 37-99. 5. Khushwant Singh, A History of the Sikhs (1839-1988), Vol. II, OUP, Delhi, 1991. 6. Kirpal Singh, Partition of Punjab, Punjabi University,Patiala,1972. 7. Pritam Singh & Shinder Singh Thandi (eds.), Punjabi Identity in Global Context, OUP, Oxford , 1999. 8. Pritam Singh, Punjab Economy: The Emerging Pattern, Enkay Publishers, New Delhi, 1995.

Jus Prof. Kiranjeet Kaur

Shaheed Bhagat Singh State University, Ferozepur

B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)			
Subject Code:	BSHH-503C			
Subject Title	Punjab History & Culture-V			
Contact Hours:	L:3	T:0	P:0	Credits:3

Unit	Content
I	Economy: Development of Resources: Transport and Communication, Agriculture; Industry, Trade and Commerce, Education.
II	Society and Culture: Aristocracy, Middle Classes, Artisans, Agricultural Labourers: Social Religious Reformers; Great Scientists of Punjab
III	National Movement: Early Nationalist Activities, Agrarian Agitation Of 1907, Ghadar Movement: Gandhian Movements.
IV	Naujwan Bharat Sabha; Hindustan Socialist Republican Association. The Akali Movement (1920-25), Jallianwala Bagh Massacre

Reference Books:

1. Baden Powell, B.H ,The Land System of British India, II, Oriental Publishers, 1974(reprint).
2. Bal, S.S., A Brief History of the Modern Punjab, Lyall Book Depot, Ludhiana,1974.
3. Banga Indu,Five Punjabi Centuries: Essays for Dr. J.S. Grewal Manohar, New Delhi 1997.
4. Banerjee, Himadri ,Agrarian Society of the Punjab, 1849-1901 Manohar Book Service, New Delhi 1982.
5. Barrier, N.G. The Sikhs and their Literature, Manohar Books Service, Delhi 1970.

Shaheed Bhagat Singh State University, Ferozepur

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B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)			
Subject Code:	BSHU-603C			
Subject Title	Punjab History & Culture-VI			
Contact Hours	L:3	T:0	P:0	Credits:3

Unit	Content
I	Partition and Rehabilitation, Punjabi Suba and Territorial Reorganization & Green Revolution.
II	Agrarian Crisis, Punjab Politics, Demographic Changes and Urbanization.
III	Centre–State Relations and the Punjab Crisis, Militancy/ Terrorism: Emergence and Impact; Drug addiction, Unemployment
IV	Punjabi Diaspora and Future Perspectives of Punjab: Economy, Politics, Culture and Society

ReferenceBooks:

1. Grewal, J.S., The Sikhs of the Punjab, CUP, Cambridge, 1990.
2. Grewal, J.S., and Indu Banga (eds.), Punjab in Prosperity and Violence: Administration, Politics and Social Change (1947-97), K.K. Publishers, Chandigarh 1998.
3. Banga, Indu (ed.), Five Punjabi Centuries: Polity, Economy, Society and Culture c. 1500- 1990: Essays for J.S.Grewal, Manohar, New Delhi,1997.
4. Puri, Harish K, Paramjit Singh Judge and Jagroop Singh Sekhon, "Terrorism in Punjab : Understanding Reality at the Grass roots Level",Guru Nanak Journal of Sociology,Vol. XVIII No.I, G.N. D. U., Amritsar, 1997, pp. 37-99.
5. Khushwant Singh, A History of the Sikhs (1839-1988), Vol. II, OUP, Delhi, 1991.
6. Harpal Singh, Partition of Punjab, Punjabi University,Patiala,1972.
7. Pritam Singh & Shinder Singh Thandi (eds.), Punjabi Identity in Global Context, OUP Oxford , 1999.
8. Pritam Singh, Punjab Economy: The Emerging Pattern, Enkay Publishers, New Delhi 1992.

Shaheed Bhagat Singh State University, Ferozepur

B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)			
Subject Code:	BSHU-503C			
Subject Title	Punjab History & Culture-V			
Contact Hours:	L:3	T:0	P:0	Credits:3

Unit	Content
I	Economy: Development of Resources: Transport and Communication, Agriculture; Industry, Trade and Commerce, Education.
II	Society and Culture: Aristocracy, Middle Classes, Artisans, Agricultural Labourers: Social Religious Reformers; Great Scientists of Punjab
III	National Movement: Early Nationalist Activities, Agrarian Agitation Of 1907, Ghadar Movement; Gandhian Movements.
IV	Naujwan Bharat Sabha, Hindustan Socialist Republican Association. The Akali Movement (1920-25), Jallianwala Bagh Massacre
	ReferenceBooks: 1. Badan Powell, B.H.,The Land System of British India, II, Oriental Publishers, 1974(reprint). 2. Bal, S.S., A Brief History of the Modern Punjab, Lyall Book Depot, Ludhiana,1974. 3. Banga Indu,Five Punjabi Centuries: Essays for Dr. J.S. Grewal Manohar, New Delhi 1997. 4 Banerjee, Himadri ,Agrarian Society of the Punjab, 1849-1901 Manohar Book Service, New Delhi 1982. 5. Barrier, N.G, The Sikhs and their Literature, Manohar Books Service, Delhi 1970.

Shaheed Bhagat Singh State University, Ferozepur

B.Sc. Non-Medical Syllabus of 3rd Year

Course Name	B.Sc.(Non-Medical)			
Subject Code:	BSHU-603C			
Subject Title	Punjab History & Culture-VI			
Contact Hours:	L:3	T:0	P:0	Credits:3

Unit	Content
I	Partition and Rehabilitation, Punjabi Suba and Territorial Reorganization & Green Revolution.
II	Agrarian Crisis, Punjab Politics, Demographic Changes and Urbanization.
III	Centre–State Relations and the Punjab Crisis, Militancy/ Terrorism: Emergence and Impact; Drug addiction, Unemployment
IV	Punjabi Diaspora and Future Perspectives of Punjab: Economy, Politics, Culture and society
	ReferenceBooks: 1. Grewal, J.S.,The Sikhs of the Punjab, CUP, Cambridge, 1990. 2. Grewal, J.S., and Indu Banga (eds.), Punjab in Prosperity and Violence: Administration, Politics and Social Change (1947-97), K.K. Publishers, Chandigarh 1998. 3. Banga, Indu (ed.), Five Punjabi Centuries: Polity, Economy, Society and Culture c. 1500- 1990: Essays for J.S.Grewal, Manohar, New Delhi,1997. 4. Puri, Harish K. Paramjit Singh Judge and Jagroop Singh Sekhon, "Terrorism in Punjab : Understanding Reality at the Grass roots Level",Guru Nanak Journal of Sociology,Vol. XVIII No.I, G.N. D. U., Amritsar, 1997, pp. 37-99. 5. Khushwant Singh, A History of the Sikhs (1839-1988), Vol. II, OUP, Delhi, 1991. 6. Kirpal Singh, Partition of Punjab, Punjabi University,Patiala,1972. 7. Pritam Singh & Shinder Singh Thandi (eds.), Punjabi Identity in Global Context, OUP, Oxford , 1999. 8. Pritam Singh, Punjab Economy: The Emerging Pattern, Enkay Publishers, New Delhi, 1995.

SHAHEED BHAGAT SINGH STATE UNIVERSITY, FEROZEPUR

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSHU-501C			
Subject Title:	ENGLISH-V			
Contact Hours	L: 3	T: 0	P: 0	Credits: 3

Details of the Course:

Unit	Content
I	(A) Literature *The Poetic Palette* (Orient Black Swan, Second Edition, 2016) The following poems from this anthology are prescribed: a. The Charge of the Light Brigade: Alfred Tennyson b. He Wishes for the Cloths of Heaven: W. B. Yeats c. True ease in writing comes from art, not chance: Alexander Pope d. Good bye party for Miss Pushpa T. S.: Nissim Ezekiel (B) Vocabulary: Various processes of Word formation; Standard Abbreviations &Acronyms; Internet Texting Abbreviations & Acronyms
II	(A) Literature *Prose Parables* (Orient Black Swan, 2013) The following stories from the above volume are prescribed: a. The Voice of God: Prem Chand b. The Face on the Wall: E.V. Lucas c. The Gold Frame: R. K. Laxman d. My Brother, My Brother: Norah Burke (B) Grammar: Use of Idioms/Phrases in sentences; Understanding Sentences Structures& practice on Transformation of sentences
III	Reading & Writing Skills: Close Reading; Comprehension; Translation (from Hindi/Punjabi to English and vice-versa) Business Correspondence-Business letters; Letter to the Editor; CV Writing; Drafting Notices & Memos
IV	Interactive practice sessions on Oral Communication • Self-Introduction. • Group Discussion and Role Play • Common Everyday Situations: Conversations and Dialogues

Recommended Books:

1. *Oxford Practice Grammar* by John Eastwood (Ed. 2014)
2. *Business English*, Delhi University, Pearson, 2008.
3. *Language, Literature and Creativity* by Kumar S P, Orient Black swan, 2013.
4. *Remedial English Grammar*. F.T. Wood. Macmillan.2007.
5. *On Writing Well*. William Zinsser. Harper Resource Book. 2001
6. *Study Writing*. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
7. *Exercises in Spoken English*. Parts. I-III. CIEFL. Hyderabad. Oxford University Press.

SHAHEED BHAGAT SINGH STATE UNIVERSITY, FEROZEPUR

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSHU-601C			
Subject Title:	ENGLISH-VI			
Contact Hours	L: 3	T: 0	P: 0	Credits: 3

Details of the Course:

Unit	Content
I	**Literature:** The study of the whole text of the play, *Brave New World by Aldous Huxley* for vocabulary enrichment, learning sentence/speech construction and understanding dialogues/conversations.
II	**Grammar and Vocabulary:** Technical Vocabulary; One word Substitution; Tenses; Active/Passive Voice; Narration; Common Errors
III	**Reading & Writing Skills:** Summary & Paraphrasing, Analysis and Interpretation; Formal Report writing; Formal Presentations-Practice on preparing Formal Presentations; Power Point Presentations
IV	**Interactive practice sessions on Oral Communication** • Communication at Workplace • Preparation for Interviews; Mock interviews • Delivering Formal Presentations/Power Point Presentations/Oral Presentations

Details of the Course:

Recommended Books:

1. *Oxford Practice Grammar* by John Eastwood (Ed. 2014)
2. *Business English*. Delhi University. Pearson. 2008.
3. *Language, Literature and Creativity* by Kumar S P. Orient Black swan, 2013.
4. *Remedial English Grammar*. F.T. Wood. Macmillan. 2007.
5. *On Writing Well*. William Zinsser. Harper Resource Book. 2001
6. *Study Writing*. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006
7. *Exercises in Spoken English*. Parts. I-III. CIEFL. Hyderabad. Oxford University Press.

SHAHEED BHAGAT SINGH STATE UNIVERSITY, FEROZEPUR

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSHU-501C			
Subject Title:	ENGLISH-V			
Contact Hours	L: 3	T: 0	P: 0	Credits: 3

Details of the Course:

Unit	Content
I	(A) Literature *The Poetic Palette* (Orient Black Swan, Second Edition, 2016) The following poems from this anthology are prescribed: a. The Charge of the Light Brigade: Alfred Tennyson b. He Wishes for the Cloths of Heaven: W. B. Yeats c. True ease in writing comes from art, not chance: Alexander Pope d. Good bye party for Miss Pushpa T. S.: Nissim Ezekiel (B) Vocabulary: Various processes of Word formation; Standard Abbreviations &Acronyms; Internet Texting Abbreviations & Acronyms
II	(A) Literature *Prose Parables* (Orient Black Swan, 2013) The following stories from the above volume are prescribed: a. The Voice of God: Prem Chand b. The Face on the Wall: E.V. Lucas c. The Gold Frame: R. K. Laxman d. My Brother, My Brother: Norah Burke (B) Grammar: Use of Idioms/Phrases in sentences; Understanding Sentences Structures& practice on Transformation of sentences
III	Reading & Writing Skills: Close Reading; Comprehension; Translation (from Hindi/Punjabi to English and vice-versa) Business Correspondence-Business letters; Letter to the Editor; CV Writing; Drafting Notices & Memos
IV	Interactive practice sessions on Oral Communication • Self-Introduction, • Group Discussion and Role Play • Common Everyday Situations; Conversations and Dialogues

Recommended Books:

1. *Oxford Practice Grammar* by John Eastwood (Ed. 2014)
2. *Business English*, Delhi University, Pearson, 2008.
3. *Language, Literature and Creativity* by Kumar S P, Orient Black swan, 2013.
4. *Beautiful English Grammar* T. E. Wood, Macmillan,2007.
5. *On Writing Well*, William Zinsser, Harper Resource Book, 2001
6. *Study Writing*, Liz Hamp-Lyons and Ben Heasly, Cambridge University Press, 2006.
7. *Exercises in Spoken English*, Parts. I-III, CIEFL, Hyderabad, Oxford University Press.

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SHAHEED BHAGAT SINGH STATE UNIVERSITY, FEROZEPUR

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSHU-601C			
Subject Title:	ENGLISH-VI			
Contact Hours	L: 3	T: 0	P: 0	Credits: 3

Details of the Course:

Unit	Content
I	Literature: The study of the whole text of the play, *Brave New World by Aldous Huxley* for vocabulary enrichment, learning sentence/speech construction and understanding dialogues/conversations.
II	Grammar and Vocabulary: Technical Vocabulary; One word Substitution; Tenses; Active/Passive Voice; Narration; Common Errors
III	Reading & Writing Skills: Summary & Paraphrasing, Analysis and Interpretation; Formal Report writing; Formal Presentations-Practice on preparing Formal Presentations: Power Point Presentations
IV	Interactive practice sessions on Oral Communication • Communication at Workplace • Preparation for Interviews: Mock interviews • Delivering Formal Presentations/Power Point Presentations/Oral Presentations

Details of the Course:

Recommended Books:

1. *Oxford Practice Grammar* by John Eastwood (Ed. 2014)
2. *Business English*. Delhi University. Pearson. 2008.
3. *Language, Literature and Creativity* by Kumar S P. Orient Black swan, 2013.
4. *Remedial English Grammar*. F.T. Wood. Macmillan. 2007.
5. *On Writing Well*. William Zinsser. Harper Resource Book. 2001
6. *Study Writing*. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006
7. *Exercises in Spoken English*. Parts. I-III. CIEFL. Hyderabad. Oxford University Press.

SHAHEED BHAGAT SINGH STATE UNIVERSITY, FEROZEPUR

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSHU-501C			
Subject Title:	ENGLISH-V			
Contact Hours	L: 3	T: 0	P: 0	Credits: 3

Details of the Course:

Unit	Content
I	(A) Literature *The Poetic Palette* (Orient Black Swan, Second Edition, 2016) The following poems from this anthology are prescribed: a. The Charge of the Light Brigade: Alfred Tennyson b. He Wishes for the Cloths of Heaven: W. B. Yeats c. True ease in writing comes from art, not chance: Alexander Pope d. Good bye party for Miss Pushpa T. S.: Nissim Ezekiel (B) Vocabulary: Various processes of Word formation; Standard Abbreviations &Acronyms; Internet Texting Abbreviations & Acronyms
II	(A) Literature *Prose Parables* (Orient Black Swan, 2013) The following stories from the above volume are prescribed: a. The Voice of God: Prem Chand b. The Face on the Wall: E.V. Lucas c. The Gold Frame: R. K. Laxman d. My Brother, My Brother: Norah Burke (B) Grammar: Use of Idioms/Phrases in sentences; Understanding Sentences Structures& practice on Transformation of sentences
III	Reading & Writing Skills: Close Reading; Comprehension; Translation (from Hindi/Punjabi to English and vice-versa) Business Correspondence-Business letters; Letter to the Editor; CV Writing; Drafting Notices & Memos
IV	**Interactive practice sessions on Oral Communication** • Self-Introduction, • Group Discussion and Role Play • Common Everyday Situations: Conversations and Dialogues

Recommended Books:

1. *Oxford Practice Grammar* by John Eastwood (Ed. 2014)
2. *Business English*, Delhi University, Pearson, 2008.
3. *Language, Literature and Creativity* by Kumar S P, Orient Black swan, 2013.
4. *Remedial English Grammar*, F.T. Wood Macmillan 2007.
5. *On Writing Well*, William Zinsser, Harper Resource Book, 2001
6. *Study Writing*, Liz Hamp-Lyons and Ben Heasly, Cambridge University Press, 2006.
7. *Exercises in Spoken English*, Parts, I-III, CIEFL, Hyderabad, Oxford University Press.

SHAHEED BHAGAT SINGH STATE UNIVERSITY, FEROZEPUR

Course Name	B.Sc. (Non-Medical)			
Subject Code:	BSHU-601C			
Subject Title:	ENGLISH-VI			
Contact Hours	L: 3	T: 0	P: 0	Credits: 3

Details of the Course:

Unit	Content
I	**Literature:** The study of the whole text of the play, *Brave New World by Aldous Huxley* for vocabulary enrichment, learning sentence/speech construction and understanding dialogues/conversations.
II	**Grammar and Vocabulary:** Technical Vocabulary; One word Substitution; Tenses; Active/Passive Voice; Narration; Common Errors
III	**Reading & Writing Skills:** Summary & Paraphrasing, Analysis and Interpretation; Formal Report writing; Formal Presentations-Practice on preparing Formal Presentations; Power Point Presentations
IV	**Interactive practice sessions on Oral Communication** • Communication at Workplace • Preparation for Interviews; Mock interviews • Delivering Formal Presentations/Power Point Presentations/Oral Presentations

Details of the Course:

Recommended Books:

1. *Oxford Practice Grammar* by John Eastwood (Ed. 2014)
2. *Business English*. Delhi University. Pearson, 2008.
3. *Language, Literature and Creativity* by Kumar S P. Orient Black swan, 2013.
4. *Remedial English Grammar*. F.T. Wood. Macmillan. 2007.
5. *On Writing Well*. William Zinsser. Harper Resource Book. 2001
6. *Study Writing*. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006
7. *Exercises in Spoken English*. Parts. I-III. CIEFL, Hyderabad. Oxford University Press.