b) For Elective II – Student can choose any one subject

Code	Subject Name
90000021	Applied Sciences (Physics & Chemistry)
90000022	Computer Application
90000023	Business Mathematics

Elective – II - APPLIED SCIENCE (Physics & Chemistry) – 1st Year (Subject Code – 90000021)

Theory	Practical
Detailed Syllabus : **SECTION A : PHYSICS** **1.0. Measurement, Units, and Dimension** 1.1 Introduction: Need for measurement, Units and documents, accuracy, precision of measuring instruments. 1.2 Types of Errors: Constant error, systematic error, environment error (errors due to external causes). Error due to imperfection, random error, gross error, percentage error. 1.3 Combination of Error: Error due to addition, subtraction, multiplication, division, powers of observed quantities. 1.4 Units and Dimensions: Fundamental and derived physical quantities, systems of units in SI systems. Rules for writing units in SI, derived units in SI. Multiples and submultiples of SI units. 1.5 Dimensions: dimensional formulae and dimensional equations, dimensional constants and dimensionless quantities, principle of homogeneity of dimensions. 1.6 Application of dimensional method of analysis: Conversion of one system of units into another, to check the correctness of an equation, to derive the relationship between different physical quantities. 1.7 Order of magnitude and significant figures 1.8 Concept of accuracy and estimation of errors	**Detailed Syllabus** Perform a simple experiment on measurement and error
2.0. Scalars and Vectors 2.1. Introduction to scalars and vectors 2.2. Addition and subtraction of vectors 2.3. Product of vectors	
3.0. Motion & Force 3.1. Definition of Motion, Uniformly accelerated motion along straight line 3.2. Position time graph and velocity-time graph 3.3. Equation of a projectile path 3.4. Time of light, Horizontal range, Maximum height of a projectile 3.5. Definition and types of forces 3.6. Introduction to gravitation, electromagnetic and nuclear forces 3.7. Law of conservation of momentum 3.8. Elastic and inelastic collisions 3.9. Momentum of force, couple and properties of couple 3.10. Centre of mass and gravity 3.11. Conditions of equilibrium of a rigid body	**Experiment on gravitational force(example of a ball falling from a certain height)**

4.0. Friction 4.1. Origin and nature of frictional forces 4.2. Laws of static and kinetic fictions 4.3. Pressure due to fluid column 4.4. Pascal's law and its applications 4.5. Newton's formula 4.6. Stoke's law 4.7. Equation for terminal velocity 4.8. Bernaulli's principle and its applications	**Proof of Stoke's theorem and Bernaulli's principle**
5.0. Dynamics 3.1 Introduction, Newton's Law of Motion. 3.2 Application of Newton's laws – Objects suspended by strings, blocks placed in contact with each other on frictionless horizontal surface, apparent weight in a lift. 3.3 Impulse, Law of conservation of linear momentum, Conservation of linear momentum during collision. 3.4 Work, power, energy potential Energy (PE), Kinetic Energy (KE), definition & derivation for both, relation between KE & linear momentum. 3.5 Conservation and non conservative forces, Work energy theorem, law of conservation of energy in case of freely falling body and vertically projected body.	**Derivation for Potential energy and kinetic energy**
6.0. Sound waves 6.1. Waves and oscillations 6.2. Progressive waves 6.3. Characteristics of transverse waves, longitudinal waves 6.4. Sound as longitudinal wave motion 6.5. Definition of period, frequency, wavelength giving their relations. 6.6. Newton's formula for velocity of sound, laplace's correction	
7.0. Thermal expansion 7.1. Expansion of solids, liquid 7.2. Linear expansion, area and volume expansion 7.3. Thermal conduction, temperature gradient and coefficient of thermal conductivity	**Experiment on expansion of solids in a thermal envirnment**
8.0. Refraction of light and lens 8.1. Refraction of light: Refraction of monochromatic light, Snell's law, Total internal reflection, Critical angle, Optical fiber, Dispersion of light, Prism formula, Rainbow, Scattering of light 8.2. Wave Theory of light: Huygen's principle, Construction of plane and spherical wave front, Wave front and wave normal, Reflection at a plane surface, Polarization, Plane polarized light 8.3. Interference and Diffraction: Interference of light, Condition's for producing steady interference, Young's experiment, analytical treatment, expression for path difference and fringe width, Measurement of wavelength by bi prism experiment, Diffraction due to single slit, Rayleigh's criteria, Difference between interference and diffraction 8.4. Critical angle, Optical fiber, dispersion of light, Prism formula, angular dispersion and dispersive power 8.5. Refraction at single curved surface	**Experiment on Refraction of light using a prism**

8.6. Lens maker's equation 8.7. Concept of conjugate foci 8.8. Magnifying power of simple microscope, compound microscope and telescope 8.9. Lens defects	
9.0. Modern Physics <u>Part A – Electrons and Photons</u> 9.1. Discovery of electron 9.2. Charge and mass of electron 9.3. Photo electric current 9.4. Einstein's equation 9.5. Photoelectric cell and its applications <u>Part B – Atoms, Molecules and Nuclei</u> 9.6. Bohr's model 9.7. Hydrogen spectrum 9.8. Laser as a light source 9.9. Wavelength of an electron 9.10. Davisson and Germer experiment 9.11. Elementary idea of electron microscope	

SECTION B – CHEMISTRY **1.0. Basics of Chemistry** 1.1. Importance of Chemistry 1.2. Fundamental and derived units and their SI units 1.3. Gay-Lussac's law, Avogadro's law 1.4. Derivation of molecular weight, gram molecular volume 1.5. Stoichiometry Mole concept 1.6. Equivalent weight, Atomic weight, Molecular weight 1.7. Percentage composition and molecular formula 1.8. Numerical based on weight-volume relationship	**Solve Problems based on weight – volume relationship**
2.0. Atomic Structure 2.1 Characteristics of electron, proton and neutron. 2.2 Rutherford model of an atom. 2.3 Nature of electromagnetic radiation, 2.4 Planck's quantum theory. 2.5 Explanation of photo electric effect. 2.6 Features of atomic spectra. 2.7 Characteristics of hydrogen spectrum. 2.8 Bohr's theory of the structure of the atom. 2.9 Bohr's explanation of spectral lines. 2.10 Failure of Bohr's theory. 2.11 Wave-particle nature of electron. 2.12 de Broglie's hypothesis, Heisenberg's uncertainty principle. 2.13 Important features of the quantum mechanical model of an atom. 2.14 Quantum numbers, concept of orbitals, define an atomic orbital in terms of quantum numbers – shapes of s, p and d orbitals, state Aufbau principle, Pauli's exclusion principle and Hund's rule of maximum multiplicity. 2.15 Electronic configurations of atoms. Explanation of stability of half filled and completely filled orbitals.	**Study of Planck's quantum theory and Bohr's theory**

3.0 Classification Of Element And Periodicity In Properties 3.1 The concept of grouping elements In accordance to their properties. 3.2 The periodic law. 3.3 The significance of atomic number and electronic configuration as the basis for periodic classification. 3.4 Classify elements into s, p, d, f blocks and discuss their main characteristics. 3.5 Periodic trends in physical and chemical properties of elements. 3.6 Periodic trends of elements with respect to atomic radii, ionic radii, inert gas radii, ionization energy, electron gain energy, electro negativity and valence. 3.7 Variation of atomic radii in inner transition elements.	**Study of Structure of periodic table**
4.0. Redox Reaction 4.1. Introduction to Oxidation & Reduction 4.2. Electron transfer concept 4.3. Oxidising & Reducing agents 4.4. Redox reactions in aqueous solutions 4.5. Oxidation number and rules for assigning oxidation number 4.6. Balancing of chemical equations	
5.0. Chemical Equilibrium 5.1. Introduction: Reversible and irreversible reactions 5.2. Rate of reaction and factors affecting it 5.3. Chemical Equilibrium 5.4. Laws of Mass action, Equilibrium constant, relationship between K_p and K_c	**Numerical problems based on K_p and K_c**
6.0. Adsorption: 6.1. Concept of adsorption 6.2. Difference between absorption and adsorption 6.3. Physical and chemical adsorption 6.4. Factors affecting adsorption 6.5. Applications of adsorption	**Experiment on absorption(example of a sponge) to give the difference between absorption and adsorption**
7.0 Chemical Bonding and Molecular Structure 7.1 Kossel-Lewis approach to chemical bonding. 7.2 Factors favorable for the formation of ionic bond, energy changes in ionic bond formation. 7.3 Crystal lattice energy – calculation of lattice energy – Bom-Haber cycle. 7.4 Crystal structures of sodium chloride and Caesium chloride. 7.5 Properties of ionic compounds. 7.6 Covalent bond – VSEPR theory and predict the geometry of simple molecules. 7.7 The valance bond approach for the formation of covalent bonds. 7.8 Directional properties of covalent bond. 7.9 Properties of covalent bond. 7.10 Different types of hybridization involving s, p and d orbitals and draw shapes of simple covalent molecules. 7.11 Definition of coordinate covalent bond with examples. 7.12 Description of molecular orbital theory of homonuclear diatomic molecules. 7.13 Bonding, antibonding molecular orbitals, o, n bond orbitals, their symmetry. 7.14 Energy diagrams of molecular orbitals of H2, N2 and 02. 7.15 Concept of hydrogen bond – Types of hydrogen bonds,	

inter and intra molecular hydrogen bonds. 7.16 Effect of hydrogen bonds on some properties of substances with examples. 7.17 Different states of matter in terms of balance between intermolecular forces, thermal energy of particles.	
8.0. S-block, P-block, d-block & F-block elements 8.1. Introduction to S & P blocks 8.2. Position in periodic table, general electronic configuration 8.3. Comparison between alkali and alkaline earth metals 8.4. Sodium occurrence, uses of sodium 8.5. Methods of extraction 8.6. Physical and chemical properties 8.7. Difficulties in isolation of fluorine 8.8. Methods of preparation 8.9. Uses of fluorine	

Elective – II - APPLIED SCIENCE (Physics & Chemistry) – 2nd Year

(Subject Code – 90000021)

Theory	Practical

Detailed Syllabus :
SECTION A - PHYSICS
1.0. Electrostatics
1.1 Gauss's theorem, proof and application
1.2 Mechanical force on unit area of a charged capacitor
1.3 Energy density of a medium
1.4 Concept of a condenser
1.5 Capacity of parallel plate condenser
1.6 Effect of dielectric on capacity
1.7 Energy of a charged condenser
1.8 Condensers in series and parallel
	Detailed Syllabus
	  1) **Proof of Gauss's theorem**
	  2) **Solve numericals on series and parallel plate capacitors**

2.0. Current, Electricity and Magnetic effects of electric current Part A – Current Electricity 2.1. Ohm's Law 2.2. Ohmic and non-ohmic resistances , specific resistance, conductance, 2.3. Temperature dependence of resistivity 2.4. Thermistor 2.5. emf of a cell - internal resistance and back e.m.f's 2.6. Kirchoff's laws: statement and explanation, application to wheatstone's bridge for its balance conditions , metre bridge, principle of potentiometer 2.7. Comparison of e.m.f. of cell, determination of internal resistance of a primary cell, Series and parallel combination of cells. Part B – Magnetic effects of electric current 2.8. Biot Savart's law 2.9. Right hand Thumb rule 2.10. Magnetic induction at the center and at the point along the axis of circular coil carrying current 2.11. Flemming's left hand rule 2.12. Definition of Ampere 2.13. Ampere's law and its applications 2.14. Moving coil galvanometer 2.15. Ammeter 2.16. Voltmeter	1) **Solve numericals on Ohm's law** 2) **Experiment on wheatstone's bridge**
3.0. Magnetism 3.1. Coulomb's inverse square law 3.2. Couple acting on a bar magnet placed in a uniform magnetic field 3.3. Magnetic moment of a magnet 3.4. Expression for Magnetic induction due to a bar magnet on axial and Equatorial lines 3.5. Superposition of magnetic fields 3.6. Tangent law 3.7. Deflection Magnetometer 3.8. Comparison of magnetic moments in Tan-A and Tan-B positions by Equal distance method and null method	

4.0. Electromagnetic waves 4.1. Electromagnetic waves and their characteristics 4.2. Transverse nature of electromagnetic waves 4.3. Electromagnetic spectrum 4.4. Propagation of electromagnetic waves in atmosphere	
5.0. Electromagnetic Induction 5.1. Laws of electromagnetic induction 5.2. Eddy currents 5.3. Self and mutual induction 5.4. Transformer 5.5. Coil rotating in uniform magnetic field 5.6. Alternating currents 5.7. Reactance and impedance 5.8. Power in a a.c. circuit with resistance, inductance and capacitance 5.9. Resonant circuit	**Solve numericals on power in a.c circuit, transformers and resonating circuits**
6.0. Semiconductors 6.1. Energy bands in solids 6.2. Intrinsic and extrinsic semiconductors 6.3. p – type and n – type semiconductors 6.4. P – N junction diode 6.5. LED 6.6. Rectifiers 6.7. Zener diode as a voltage regulator 6.8. Solar cell 6.9. Transistor as an amplifier 6.10. Oscillators 6.11. Logic gates	
7.0 Communication 7.1. Space communication 7.2. Ground, sky and space wave propagation 7.3. Satellite communication 7.4. Line communication 7.5. Two wire lines 7.6. Cables 7.7. Optical communication	**Study of various types of cables and wires**
SECTION B - CHEMISTRY **6.0. Electrochemistry** 6.1 Electrolytes and Non-electrolytes. 6.2 Faraday's laws of electrolysis. 6.3 Galvanic & Voltaic cells representation 6.4 Nernst equation (No derivation) , e.m.f. calculations.	**Experiment on faraday's law of electroststics**
7.0 Nuclear Chemistry 7.1 Composition of Nucleus - Isotopes, Isotones, Isobars, Nuclear stability - Factors effecting Nuclear stability, mass defect, binding energy, Average binding energy, N/P ratio, Magic Numbers). 7.2 Radio-active disintegration and its rate-Half-life and average life. 7.3 Natural and artificial radio-activity, disintegration series-Group displacement law-Types of Nuclear reactions (fission and fusion)-Differences between Nuclear and Chemical reactions- Radio-active isotopes and their applications Idoine 131 , Cobalt 60 , Sodium 24 , C 14 and P 30.	**Solve numericals on binding energy and half life rate**

8.0 Surface Chemistry 8.1 Adsorption and absorption. Physical and chemical adsorption-distinguishing properties-Adsorption of gases on Metals Adsorption from solutions (Elementary treatment). 8.2 Colloidal state:- True and colloidal solutions – Explanation of the terms - Dispersion medium, dispersed phase, Iyo-phillic and Iyo-phobic sols using the examples; smoke, cloud, blood, milk, starch solution and gold sol. 8.3 Emulsions:- Emulsifying agent and emulsification - its applications. Cleansing action of soap. 8.4 Catalysis - Explanation of the terms – Homogeneous and Heterogeneous catalysis – distinctions with suitable Examples-auto catalysis with one example	
9.0. Acids and Bases 9.1 Theories of Acids and Bases Lowry - Bronsted concept Lewis theory of acids and bases. 9.2 Ionic product of water, PH, Buffers - Numerical problems on these, Indicators - Choice of indicators, PH-range and uses. 9.3 Salt hydrolysis - Types of hydrolysis with examples.	**Solve numericals on pH value.**
10.0 Alkanes, Akkenes, Alkynes and Aromatic compounds 10.1. Introduction and importance of organic chemistry 10.2. General characteristics of organic compounds Classification of organic compounds	
11. Ethers **11.**1 Introduction:- Definition 11.2 Classification:- 11.3 Nomenclature and metamerism 11.4 Preparation, Reactions & Uses	**Study of Simple and mixed ethers with examples.**
12. Aidehydes and Ketones 12.1 Introduction 12.2 Carbonyl Compounds & classification 12.3 Nomenclature of aldehydes and ketones 12.4 Preparation & reaction of Aldehydes and ketones	
13.0 Acids & Esters 13.1. Introduction, Nomenclature, preparation, Reaction and uses of Acids & Easters	**Study of various types of acids**
14.0. Amines 14.1. Introduction, Classification and Nomenclature 14.2. Preparation of primary amines 14.3. Reaction of amines	
15.0. Biomolecules & Synthetic Fibres 15.1. Introduction 15.2. Carbohydrates and Proteins 15.3. Fats & Oils 15.4. Classification of Fibres 15.5. Preparation of fibres 15.6. Physical properties and uses of fibres	**Study of fibres**
16.0. Chemistry in application 16.1. Application of Chemicals in Medicine & healthcare 16.2. Application of chemicals in Food preservatives 16.3. Application of chemicals in Agricultural products	

Elective –II - Computer Applications– 1st year
(Subject Code – 90000022)

Theory	Practical
Detailed Syllabus :	**Detailed Syllabus**
1.0. Introduction	**1.0. Computer basics**
1.1. Basic Computer and its structural theory	1.1. Identification of Keyboard, Printer, Monitor Scanner, Webcam, Microphone, Speaker
1.2. Input devices	
1.3. Output devices	
1.4. Storage devices	1.2. Sample collection of various type of storage devices, specifications and charts
1.5. Computer types and their applications	
1.6. Computer Software/Hardware	
2.0. Operating systems	**2.0. Practice**
2.1. Various types of Operating systems	2.1. Practice of MS DOS commands
2.2. Comparison between the different types of OS	2.2. Installation of MS Windows
2.3. Network Operating systems and their features	2.3. Practice on Add/Remove programs
2.4. Microsoft Disk Operating System, its nature and history.	2.4. Practice on My computer, Display properties, My documents, My Network places
2.5. Unix, features, merits and demerits in using Unix as OS.	
2.6. Microsoft Windows, development & growth of MS Windows, features, merits and demerits of MS Windows.	
2.7. MS Windows NT, features, merits & demerits	
2.8. System requirements for various Operating Systems	
2.9. Windows default icons and their applications	
3.0. Microsoft Word	**3.0. Documentation**
3.1. Introduction to MS Office	3.1. Create and save a document
3.2. MS Word applications	3.2. Format the text with different font size, font styles
3.3 Creation of Document and file operations	
3.4. Formatting features of document	3.3. Setting up different page sizes, orientation.
3.5. Modification/ editing documents	
3.6. Inserting images, files, tables, symbols and various attributes	3.4. Making various type of documents like Bio Data, letters, project reports
3.7. Creating and formatting of tables	3.5. Printing of documents
3.8. Mail merge	
3.9. Page layout and design features	
3.10. Spell & grammar check in documents	
3.10. Print preview & printing of documents	
3.11. Converting documents to PDF files.	
4.0. Microsoft Excel	**4.0. Practice of Worksheets**
4.1. Introduction to Excel and its applications	4.1. Create and save worksheets
4.2. Features of MS Excel	4.2. Editing the worksheets
4.3. Outline of Worksheet & Workbook	4.3. Formatting worksheets
4.4. Data types	4.4. Insert charts
4.5. Study of various menus of MS Excel	4.5. Making worksheets using formulas & functions
4.6. Creation of worksheet, editing worksheets, save, copy & deleting worksheets.	
4.7. Functions of MS Excel	4.6. Making worksheets & printing with different formatting effects
4.8. Formulas of MS Excel.	
4.9. Types of charts, creation of data Charts, editing and insertion of charts.	4.7. Making worksheets with images, numbers and print them
4.10. Sort facility	
4.11. Interconnecting Charts	
4.12. Page setup, printing worksheets, charts… etc.	
4.13. Converting Worksheets to PDF files.	

Theory	Practical
5.0. MS Power point 5.1. General Introduction 5.2. Features & Applications of MS Power point 5.3. Creating Presentations 5.4. Study of different layouts and making presentations using different layouts 5.5. Using different animation effects. 5.6. Add Audio/Voice and visual effects to slides. 5.7. Filtration 5.8. Converting presentations to PDF files. 5.9. Inserting images, symbols to slides	**5.0. Power Point practice** 5.1. Create Slides of different types 5.2. Running presentations 5.3. Add slide transition effects and run slide show 5.4. Make presentations with audio/visual effects. 5.5. Printing PPT files 5.6. Making PDF format of PPT files
6.0. Networking & Internet Utilities 6.1. General Introduction of Computer Networking 6.2. Requirements/ Applications of Computer Networking 6.3. Layouts of Different Networks 6.4. Study of various Networking components 6.5. Limitations and merits of different topologies 6.6. Study of Server/client concept 6.7. Internet & its applications 6.8. Email and Chatting 6.9. E-trading concepts 6.10. Downloading files (Text and media files)	**6.0. Networking practice** 6.1. Identifying different network components 6.2. Collecting samples, charts, images of different networking components. 6.3. Installation of Network Interface card 6.4. Getting connected to Internet and accessing the internet 6.5. Creating personalized Email account 6.6. Chatting (Text and Voice chat) 6.7. Searching/surfing for the information in different sites. 6.8. Downloading
7.0. Project work 7.1. Understand the concept of making projects and preparing the project reports. 7.2. Preparation of a project using the software skills learned during the course.	**7.0. Project Work** 7.1. Making a working model/project using MS Excel/Power Point 7.2. Project Report

Elective –II - Computer Applications– 2nd year
(Subject Code – 90000022)

Theory	Practical
Detailed Syllabus : **1.0. Introduction MS Access** 1.1. Objects of learning MS Access 1.2. Applications of MS Access 1.3. Database and Database Management System 1.4. Elements of Database Management System 1.5. Types of Data Bases & the merits & demerits	**1.0. Study of overview of MS Access** 1.1. Accessing MS Access and its menus to get familiar with it
2.0. Controlling Data Entry 2.1. Restrict Data Entry using field properties 2.2. Establish a pattern for entering field values 2.3. Create a list of values for a field	**2.0. Creating Data Tables, Designing Fields and setting field properties**
3.0. Joining Tables and creating Queries 3.1. Create Query joins 3.2. Join unrelated tables 3.3. Relate data within a table 3.4. Set Select Query properties 3.5. Create Parameter Queries 3.6. Create Action Queries	**3.0. Creating Queries**
4.0. Forms & Reports 4.1. Design a Form Layout 4.2. Enhance the appearance of a Form 4.3. Restrict Data entry in forms 4.4. Adding a command button to a Form 4.5. Create a Subform 4.6. Organize report information 4.7. Format the report 4.8. Set Report Control properties 4.9. Control Report pagination 4.10. Summarize Report information 4.11. Add a sub report to an existing report 4.12. Create a mailing label report	**4.0. Practicing Forms and Reports** 4.1. Creating different forms using different layouts 4.2. Data entry in to the forms 4.3. Creating different Reports using different layouts 4.4. Data formatting in to reports
5.0. Sharing data across applications 5.1. Import data in to Access 5.2. Export data from Access 5.3. Analyze Access data in Excel 5.4. Export Access data to a Text file 5.5. Merge Access data with a Word document	**5.0. Practice:** 5.1. Import Excel sheets in to Access 5.2. Import Tables in to Access 5.3. Export Access tables in to Excel format 5.4 Export Access data to a Text file 5.5. Merging data
6.0. Study of Application packages 6.1. Introduction to application oriented software packages 6.2. Study of Railway reservation Package 6.3. Study of different modules and menus available in online Railway Reservation Package 6.4. Study of Banking packages 6.5. Study of Library Management packages 6.6. Study of Inventory control packages 6.7. Study of School Management Packages	**6.0. Practice** 6.1. Collection of different trial packages 6.2. Visiting Organizations to collect different formats and procedures used in the system 6.3. Creating forms and Reports for the different packages using appropriate data bases
7.0. Project work 7.1. Understand the concept of making projects and preparing the project reports. 7.2. Visiting different organizations to have an idea of different packages 7.3. Preparation of a project using the software skills learned during the course.	**7.0. Project Work** 7.1. Making a working model/project using MS Access 7.2. Project Report

Elective – II - Business Mathematics – 1st year
(Subject Code – 90000023)

Theory	Practical
Detailed Syllabus:	**Practice:**
1.0. Logarithms	1. At least 5 to 10 exercises per chapter
1.1. Introduction to logarithms	2. One home/class assignment per chapter
1.2. Laws of logarithm, characteristics and mantissa	
2.0. Sets, Relations and functions	
2.1. Study of Relation, Function	
2.2. Types of functions	
2.3. Domain, Co – domain, Range of a function	
2.4. Composite and Inverse functions	
2.5. Graphs of functions	
3.0. Complex Numbers	
3.1. Definition of complex numbers	
3.2. Line	
4.0 Quadratic Equations	
4.1 Nature of roots of Quadratic Equation	
4.2 Sum and Product of roots of quadratic equations	
4.3 Formation of Quadratic Equations	
4.4 Symmetric functions of roots	
4.5 Cubs roots unity	
5.0. Determinants	
5.1 Determinant of order three	
5.2 Applications of Determinants	
6.0. Trigonometric ratios	
1.1. Angles & its measurements	
1.2. Trigonometric ratios	
1.3. Relation between degree and radian.	
1.4. Fundamental identities.	
1.5. Examples based on Fundamental Identities	
1.6. Trigonometric ratios of sum and difference of two angles	
1.7. Factorization formulae	
1.8. Inverse trigonometric functions	
1.9. Properties of a Triangle	
7.0. Plane Co-ordinate Geometry	
7.1. Locus	
7.2. Line	
8.0 Partition values and measure of dispersion	
8.1 Partition values	
8.2 Measures of Dispersion	
9.0. Moments Skewness Kurtosis	
9.1 Moments	
9.2. Skewness	
9.3 Kurtosis	
10.0. Bivariate frequency distribution and correlation	
10.1.Bivariate frequency distribution	
10.2 Bivariate Correlation	
10.3 Rank correlation	
11.0. Permutations and Combinations	
11.1 Factorial notation	
11.2 Principle of counting	
11.3 Permutations	
11.4 Combinations	

12.0. Probability 12.1 Types of Event 12.2 Addition Theorem 12.3 Conditional Probability	
13.0. Random Variable and Probability Distribution 13.1 Definition and Types of Random variable 13.2 Probability Distribution of random variable 13.4. Risk and uncertainty	
14.0. Commercial Arithmetic 14.1 Commission Brokerage 14.2 Discount 14.3 Insurance	

Elective – II - Business Mathematics – 2nd year
(Subject Code – 90000023)

Theory	Practical
1.Mathematical Logic 1.1 Statements and logical connectives 1.2 Statement pattern and logical equivalence 1.3 Venn Diagram	
2. Matrices 2.1 Definition and Types matrices 2.2 Algebra Matrices 2.3 Inverse of a Matrix 2.4 Solution of Equations	
3. Limit and Continuity 3.1 Definition 3.2 Algebra of limits 3.3 Application of Standard limits 3.4 Continuity of a function at a point	
4. Differentiation 4.1 definition of Derivative 4.2 Derivative from first principles 4.3 Rules of Differentiation 4.4 Derivative of composite functions 4.5Derivative of Inverse functions 4.6 Logarithmic Differentiate 4.7 Derivates of Implicit functions 4.8 Derivatives of Parametric functions. 4.9 Second order derivatives	
5. Application of Derivatives 5.1 Increasing and Decreasing functions 5.2 maxima and Minima 5.3 Approximation and Error	
6. Integration 6.1 Definition of an integral 6.2 Integral of standard functions 6.3 Rules of Integration 6.4 Methods of Integrations Integration by parts 6.5 Definite Integrals	
7. Differential Equations 7.1 Definition 7.2 Formation of Differential Equations 7.3 Solution of first order and first degree differential equations 7.4 Applications of Differential equations	
1.Theory of Attributes 1.1 Introduction Notation and class frequencies 1.2 Consistency of data 1.3 independence of Attributes 1.4 Association of Attributes	
8. Regression Analysis 8.1 Introduction 8.2. Data and information 8.3. Tabulation of data 8.4. Graphs and diagrams, scatter diagrams, histograms, bar charts…etc 8.5 Equation of lines of regression 8.6 Regression coefficient and its properties	

9. Numerical Methods 9.1 Finite differences 9.2 Interpolation with equal intervals 9.3 Interpolation with unequal intervals 9.4 Numerical integration	
10. Discrete Probability Distribution 10.1 Binomial Theorem 10.2 Binomial Distribution 10.3 Poisson Distribution	
11. Management Mathematics 11.1 linear programming problem 11.2 Assignment problem 11.3 Sequencing	
12. Demography 12.1 Introduction, definition, Uses of vital statistics 12.2 Measurements of Mortality 12.3 Life tables	
13. Index Number 13.1 Introduction 13.2 Definition and Notations of index numbers 13.3 Types of index number 13.4 Construction of index number 13.5 cost of living index number 13.6 Uses of cost of living index number	
14.0. Spread sheets 14.1. Introduction to spread sheets 14.2. Features and functions of spread sheet softwares 14.3. Use and limitations of spread sheet softwares in business 14.4. Apply spread sheet software to the manual work of chartered management accountant.	**Practice:** 1. Using spread sheet package 2. Entering data in to Spread sheet 3. Making graphs the selected data using Spread sheet packages 4. Using functions and formulas 5. Making accounts using Spread sheet packages