

Maharashtra State Board of Vocational Examination, Mumbai 400 051

1	Name of Course	Certificate Course in Exterior and Interior Design									
2	Course Code	304415									
3	Max no. of Students	25									
4	Duration	2 year									
5	Course Type	Full Time									
6	No. of Days per week	6 days									
7	No. of hours per day	7 Hrs									
8	Space require	Theory Class Room – 200 sqft Practical Lab – 1500 sqft									
9	Entry qualification	S.S.C. Pass									
10	Objective of syllabus	a) To enable students to recognize the basic principles and methods of creating an attractive interiors, b) To learn to provide adequate facility for work relaxation, comfort privacy maintenance and aesthetics through interiors & exteriors. c) To study the materials and services involved along with fittings and fixtures to be used in interiors schemes d) To understand the requirement for the preparation of complete interior & exterior schemes									
11	Employment opportunities	To work as individual Interior and Exterior Designer, Work in as assistant in the office of Builder, Interior Designer, Architect, Consulting Civil engineer. Work as consultant for various building services provider.									
12	Teachers Qualification	For Vocational Subject - B.E. Civil and For Non Vocational Subject - Master Degree in concern Subject.									
13	Teaching Scheme –										
		Sr.	Subject	Subject Code	Clock Hours / Week				Total		
					Theory	Practical					
		1	English (Communication Skill)	90000001	2 Hrs	1 Hrs			3 Hrs		
		2	Elective – I		2 Hrs	1 Hrs			3 Hrs		
		3	Elective – II		2 Hrs	1 Hrs			3 Hrs		
		4	Interior and Exterior Design	30440018	3 Hrs	8 Hrs			11 Hrs		
		5	Building Drawing and CAD	30440002	3 Hrs	8 Hrs			11 Hrs		
		6	Construction Material and Services	30440019	3 Hrs	8 Hrs			11 Hrs		
		Total								42 Hrs	
14	Internship	Two Months Summer Internship from 1 st May to 30 th June is Compulsory.									
15	Examination Scheme – Final Examination will be based on syllabus of both years.										
		Paper	Subject	Subject Code	Theory			Practical		Total	
					Duration	Max	Min	Duration	Max	Min	Max
		1	English (Communication Skill)	90000001	3 Hrs	70	25	3 Hrs	30	15	100
		2	Elective – I		3 Hrs	70	25	3 Hrs	30	15	100
		3	Elective – II		3 Hrs	70	25	3 Hrs	30	15	100
		4	Interior and Exterior Design	30440018	3 Hrs	100	35	3 Hrs	100	50	200
		5	Building Drawing and CAD	30440002	3 Hrs	100	35	3 Hrs	100	50	200
		6	Construction Material and Services	30440019	3 Hrs	100	35	3 Hrs	100	50	200
											900
											375
16	Teachers – Three Teachers per batch for vocational component. For English, Elective-I & II guest faculty on clock hour basis.										
17	a) For Elective I – Student can choose any one subject					b) For Elective II – Student can choose any one subject					
		Code		Subject Name		Code		Subject Name			
		90000011		Applied Mathematics		90000021		Applied Sciences (Physics & Chemistry)			
		90000012		Business Economics		90000022		Computer Application			
		90000013		Physical Biology (Botany & Zoology)		90000023		Business Mathematics			
		90000014		Entrepreneurship							
		90000015		Psychology							

Subject Name : English (Communication Skill) - 1st Year

(Subject code : 90000001)

1) PROSE

	TOPIC	AUTHOR	
1	SPOKEN ENGLISH AND BROKEN ENGLISH	GEORGE BERNARD SHAW	
2	THE HOMECOMING	RABINDRANATH TAGORE	
3	WHAT WE MUST LEARN FROM THE WEST	N.R. NARAYAN MURTHY	
4	AFTER 20 YEARS	O .HENRY	
5	THE HAPPY PRINCE	OSCAR WILDE	

2) POETRY

1	IF	RUDYAR KIPLING	
2	BABY'S WORLD	RABINDRANATH TAGORE	
3	POISON TREE	WILLIAM BLAKE	
4	PSALM OF LIFE	H.W.LONGFELLOW	
5	HOPE	SIDDHARTH ANAND	

3) GRAMMER

		EXERCISES
PARTS OF SPEECH NOUNS : KINDS OF NOUNS AND USAGES PRONOUNS PREPOSITIONS ADJECTIVES CONJUNCTION VERB ADVERB INTERJECTION	INTRODUCTION AND EXPLANATION	SENTENCE CORRECTIONS

ARTICLES / APOSTROPHES		
DIRECT /INDIRECT SPEECH		
HOMONYMS/HOMOPHONES		
FIGURES OF SPEECH		
LETTER WRITING – FORMAL AND INFORMAL		
COMPREHENSIONS		
EMAIL AND BUSINESS LETTERS (FORMAT TO BE TAUGHT WHICH IS USED IN WORKPLACE)		
COMPOSITIONS		

4) NON DETAIL

My experiments with truth – M.K.GANDHI

(an autobiography)

5) PRACTICAL

PRACTICALS – 30 MARKS

(BASED ON PERSONAL ENHANCEMENT)(THROUGH SKITS/CHARTS/FLASH CARDS/SKITS/PRACTICAL PROJECT)

OBJECTIVE : GROOMING THE STUDENT TOWARDS HIS CAREER.

AT THE END OF EACH TOPIC, THE STUDENT HAS TO HAVE BENEFITTED FROM IT.

KNOW THYSELF

GOAL SETTING HELP STUDENTS IDENTIFY THEIR OWN GOALS AND THUS LINK TO THEIR CAREERS AS PART OF CURRICULUM

TIME MANAGEMENT

TEAM WORK

INTERPERSONAL COMMUNICATION

GENERAL KNOWLEDGE/ QUIZ BASED ON THEIR SUBJECT

SPOKEN ENGLISH

English (Communication Skill) – 2nd year.

1) PROSE

	TOPIC	AUTHOR	
1	SPEECH AT CHICAGO	SWAMI VIVEKANANDA	
2	THE CASE FOR THE DEFENCE	GRAHAM GREENE	
3	WAITING FOR THE BUDDHA		
4	WATER – THE ELIXIR OF LIFE	C.V.RAMAN	
5	A HORSE AND TWO GOATS	R.K.NARAYAN	

2) POETRY

1	ROAD NOT TAKEN	ROBERT FROST	
2	Even this shall pass		
3	TO INDIA	SAROJINI NAIDU	
4	ALL THE WORLDS A STAGE	WILLIAM SHAKESPEARE	
5	A PRAYER FOR MY MOTHERS BIRTHDAY	HENRY VAN DYKE	

3) GRAMMER

		EXCERCISES
PARTS OF SPEECH NOUNS : KINDS OF NOUNS AND USAGES PRONOUNS PREPOSITIONS ADJECTIVES CONJUNCTION VERB ADVERB INTERJECTION	Different usages on the lines of competitive exams	SENTENCE CORRECTIONS

ARTICLES / APOSTROPHES		
DIRECT /INDIRECT SPEECH		
HOMONYMS/HOMOPHONES		
FIGURES OF SPEECH		
LETTER WRITING – FORMAL AND INFORMAL		
COMPREHENSIONS		
EMAIL AND BUSINESS LETTERS (FORMAT TO BE TAUGHT WHICH IS USED IN WORKPLACE)		
COMPOSITIONS		

4) NON DETAIL

MY EXPERIMENTS WITH TRUTH – M.K.GANDHI

5) PRACTICALS

CAREER CHART.(DEPENDING ON THE STREAM CHOSEN BY THE STUDENT)

ETIQUETTE FOR INTERVIEWS

BODY LANGUAGE

BUSINESS LETTERS

PRESENTATIONS

MARKING SCHEME :

PROSE : 20

POETRY : 15

GRAMMAR : 25

NON DETAIL : 10

PRACTICALS : 30

Elective 1 : Applied Mathematics - 1st Year

(Subject code : 90000011)

Theory	Practical
Detailed Syllabus: 1.0. 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 compound angles 1.7. Factorization formulae 1.8. Inverse trigonometric functions 1.9. Properties of a Triangle	Detailed Syllabus: Solve problems on: 1) Conversion of radian to degree 2) Conversion of degree to radian
2.0. Plane co-ordinate geometry 2.1. Locus 2.2. Line	
3.0 Vectors and Linear Equalities 3.1. Definition of vector, position vector 3.2. Algebra of vectors (Equality, addition, subtraction and scalar multiplication) 3.3. Dot (Scalar) product with properties. 3.4. Vector (Cross) product with properties. 3.5. Solutions of Linear inequalities in one variable and two variables	
4.0. Determinants and Matrices 4.1. Definition and expansion of determinants of order 2 and 3. 4.2. Cramer's rule to solve simultaneous equations in 2 and 3 unknowns 4.3. Definition of a matrix of order $m \times n$. 4.4. Types of matrices. 4.5. Algebra of matrices such as equality, addition, Subtraction, scalar multiplication and multiplication. 4.6. Transpose of a matrix. 4.7. Minor, cofactor of an element of a matrix, adjoint Of matrix and inverse of matrix by adjoint method. 4.8. Solution of simultaneous equations containing 2 and 3 unknowns by matrix inversion method.	Solve problems on Cramer's rule
5.0 Statistics and Probability 5.1. Measure of dispersion; mean deviation, variance and standard deviation of ungrouped/grouped data. 5.2. Analysis of frequency distributions with equal means but different variances. 5.3. Random experiments: outcomes, sample spaces (set representation). 5.4. Events: occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events 5.5. Probability of an event, probability of 'not', 'and' & 'or' events.	State and prove Baye's theorem

6.0. Set Relations & Functions 6.1. Types of functions 6.2. Domain, Co – domain, Range of a function 6.3. Composite and Inverse functions 6.4. Graphs of functions	Solve problems on Graphs
7.0. Logarithms 7.1. Introduction and Definition 7.2. Laws of logarithms 7.3. Numerical problems based on multiplication, division and power.	Solve problems on power law
8.0. Complex Numbers and Quadratic equations 8.1. Complex Numbers in the form of $a+ib$ 8.2. Modulus, Complex conjugate, Argument of complex numbers 8.3. Algebra of complex numbers 8.4. Square root of complex numbers 8.5. Argand diagram 8.6. Nature of roots 8.7. Sum and product of roots 8.8. Formation of quadratic equation 8.9. Symmetric functions of roots 8.10. Cube roots of unity	
9.0. Sequences and Series 9.1. Definition of a sequence 9.2. Geometric Progression and Arithmetic Progression 9.3. Arithmetic mean, Geometric mean, harmonic mean 9.4. Special Series	1) Proof of arithmetic progression and geometric progression 2) Proof of arithmetic mean and geometric mean
10.0 Permutations and Combinations 10.1. Factorial notation 10.2. Fundamental principle of counting 10.3. Permutation 10.4. Combinations	
11.0 Mathematical Induction and binomial theorem 11.1. History, statement, Proof of Binomial theorem for positive integral indices, Pascal's triangle, general and middle term in binomial expansion 11.2. Principle of mathematical induction and it's application 11.3. Simple applications	Proof of Binomial theorem

Elective 1 : Applied Mathematics - 2 nd Year

(Subject code : 90000011)

Theory	Practical
Detailed Syllabus : 1.0. CALCULUS: Limits and Continuity 1.1. Definition of a limit 1.2. Algebra of limits 1.3. Standard limits 1.4. Limit at infinity and infinite limits 1.5. Continuity of a function at a point 1.6. Algebra of continuous functions 1.7. Continuity in interval 1.8. Continuity of some standard functions	Detailed Syllabus 1) Theorem on a limit of a sequence 2) Theorem on continuity in interval

2.0. Differentiation 2.1. Derivative using first principle 2.2. Rules of Differentiation 2.3. Derivatives of standard functions 2.4. Derivatives of logarithmic and exponential functions 2.5. Derivative of composite functions 2.6. Derivative of Inverse functions 2.7. Derivative of implicit and parametric functions 2.8. Second order derivatives	Proof of derivative using the first principle with the help of an example
3.0. Applications of Derivatives 3.1. Geometrical applications 3.2. Derivative as a rate of change measure 3.3. Approximations 3.4. Maxima and Minima	
4.0. Integration 4.1. Definition of an integral of a function 4.2. Integrals of some standard functions 4.3. Rules of integration 4.4. Indefinite Integration 4.5. Definite Integration	Solve problems on definite integration
5.0 Application of Definite Integrals 5.1. Area under the curve 5.2. Volume of solid of revolution	
6.0. Differential equations 6.1. Definition 6.2. Formation of differential equations 6.3. Solution of first order and first degree differential equations 6.4. Applications of differential equations	Solve problems on first order and first degree differential equations
7.0 Numerical Methods 7.1. Definition of various operators and relation between the operators 7.2. Interpolation methods 7.3. Numerical integration	
8.0. Mathematical Logic 8.1. Statements and logical connectives 8.2. Statement Pattern and Logical equivalence 8.3. Application of logic	
9.0. Geometry 9.1. Pair of straight lines passing & not passing through origin 9.2. Circle: definition, Tangent and Normal 9.3. Conic: Equation of Conics 9.4. Three Dimensional Geometry: Direction Cosines and ratios, Line, Plane	
10.0. Linear Programming Problems 10.1. Linear Programming Problems 10.2. Simplex Method	Solve problems on simplex method
11.0. Boolean Algebra 11.1. Boolean Algebra as an algebraic structure 11.2. Principle of Duality 11.3. Boolean function & switching circuits 11.4. Application of Boolean Algebra to switching circuits	State and explain the principle of duality

Elective - I - Business Economics – 1st year

(Subject Code – 90000012)

Theory	Practical
<p>Detailed Syllabus :</p> <p>1. Introduction to Economics –</p> <p>1.1 Meaning & Scope -</p> <p>1.2 Relevance of Economics to different disciplines - Economics & Management, Economics & Law- Economics and Humanities –</p> <p>1.3 Micro Economics and Macro economics</p>	<p>1) Prepare a project on usefulness of micro – economics.</p> <p>2) Prepare a project on usefulness of micro – economics.</p> <p>3) Conduct a GD on the importance of Micro Economics and Macro Economics</p>
<p>2. Macro Economics –</p> <p>2.1 Meaning, Definition and Features.</p> <p>2.2 Aggregates-Nature of Aggregates , problems of Aggregation.</p> <p>2.3 National Income, Meaning, Definition of National Income Different National Income Concepts</p> <p>2.4. Estimation of National Income – Methods and Difficulties</p>	<p>1) Prepare a PPT presentation on macro-economics, National Income and how it is computed and the difficulties in measuring National Income.</p> <p>2) Prepare a chart on the circular flow of National Income.</p> <p>3) Make a comparative study of closed economy and open economy.</p> <p>4) Conduct a case study of 5 individual families and find out the Disposable income to the individuals.</p>
<p>3. Determinants of Aggregates</p> <p>3.1. Aggregate Demand and their components</p> <p>3.2 Aggregate Supply and their components</p>	<p>Prepare a chart on the components of aggregate demand.</p> <p>Conduct a GD on Keynes theory of employment and principles of effective demand.</p> <p>Take 2 or 3 case studies on entrepreneurship and discuss to what extent they provide employment to people.</p>
<p>4. Money and Banking</p> <p>4.1 Meaning, definitions and functions of Money</p> <p>4.2 Commercial Banks: Meaning and Functions.</p> <p>4.3 Central Banks: Meaning and Functions.</p>	<p>Find out RBIs concept of money supply.</p> <p>A visit to various financial institutions.</p> <p>A visit to a rural bank, cooperative bank, commercial bank.</p> <p>A visit to the RBI Training college, NABARD OR IDBI</p> <p>Further For the first year the practical will consist developing familiarity with banking functions and will comprise Of what are different types of banking services, facilities, available to individuals/organizations? (to increase the financial literacy)</p> <p>how to open a bank account?</p> <p>different investments like – FD,MF</p> <p>facilities for financial inclusion</p>

5 Public Economics 5.1 Government Budget and the Economy Government Budget – Meaning and its components 5.2 Types of Government Budget – Balanced, Surplus and Deficit.	Prepare a report on sources of revenue in the budget of local Government. Comment. Conduct a GD on last year's government budget. Find out how a private budget/ finance differs from public budget/ finance Prepare hypothetical master budget for an imaginary company and discuss how you have allocated the funds for each department. Prepare a separate budget for production, personnel and administration, finance, marketing, advertising, etc.
6. International Trade 6.1 Comparative cost principal of International Trade. 6.2 Free trade Advantages, Disadvantages 6.3 Protectionist trade advantages, Disadvantages	1) Collect data on India's direction of trade 2) Collect data on India's trade Composition
Theory	Practical
Detailed Syllabus : 7.1. Concepts of Economic Growth and Economic Development 7.2 Indicators of Economic Development Monetary indicators 7.3 Human Development indicators	1) To make a project on discrepancies in India's economic growth and development. 2) Discuss the patterns of education among women in the post independence period. 3) Collect information on Human Development Index for different Indian states.
8.0. Structural Changes in the Indian Economy since 1991. 8.1 Economic reforms since 1991: Need and main features, Liberalization, privatization and Globalization. Their impact on Indian Agriculture, Industries and Service Sector. 8.2 Economic Planning – Meaning and Objectives 8.3 Achievements and Failures of 10th Five – Year Plan	1) Conduct a GD on the New Economic Policy, 19991 and its impact on the various sectors. 2) Visit to Agricultural Produce Market Committee to study the price Fixation of agricultural commodities. 3) Collection of market intelligence of agricultural commodities from newspaper and journals. 4) A visit to a cottage industry, small scale industry, large scale industry. 5) A visit to a MNC. Prepare an assignment on the WTO.
9.0. Current Challenges of Indian Economy 9.1 Problem of Population Explosion in India Causes, Effects and Remedial Measures to remove these problems 9.2 Problem of Poverty in India Causes, Effects and Remedial Measures to remove these problems 9.3 Problem of Unemployment in India Causes, Effects and Remedial Measures to remove these problems	Conduct a GD on population explosion and its impact. Prepare a comparative chart on employment in India during the five year plans. Conduct a GD to find out measures for poverty alleviation. Make ppt presentation on population explosion, poverty, unemployment.

10.0. Infrastructural Development in India 10.1 Transport and Communication, 10.2 Energy, 10.3 Health and Education	Prepare a project report on recent trends in communication. Prepare transport documents of trade namely goods forwarding note, lorry receipt, delivery challan, railway receipt, mates receipt, Bill of lading, airway bill, etc. Conduct case studies on different energy companies like Carin India, Power Corporation of India, Reliance Energy, Coal India Ltd. Collect secondary data on health and education.
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Elective - I - Business Economics – 2 nd year

(Subject Code – 90000012)

Theory	Practical
. Introduction Micro Economics – 1.1 Meaning, Definition ,Nature 1.2 Tools of Analysis, 1.3 Role of Assumptions	1) Conduct a GD on the usefulness of Micro economics 2) Prepare a PPT on the role of assumptions in Economics
Consumer Behaviour and Demand Analysis 2.1 Concept of Utility, Total and Marginal Utility, Law of Diminishing Marginal Utility. Law of Equi – marginal Utility. 2.2 Concept of demand, Types of demand, Determinants of Market demand, Law of demand. 2.3 Price elasticity of demand – Concept and Importance	1) Make a ppt presentation on U. TU, MU, Law of diminishing marginal utility and law of equi – marginal utility. 2) Conduct a GD to substantiate the point that consumer behaviour mainly depends on economic theories. 3) Conduct a case discussion on elasticity of demand. 4) A visit to a mall/ departmental store to study consumer behaviour.
Producer Behaviour and Supply Analysis. 3.1 Meaning of Supply 3.2 Market Supply 3.3 Determinants of Market Supply and Law of Supply.	1) Make a PPT differentiating total output, Stock and Supply concepts. 2) Make chart on law of supply with schedules and supply curve. 3) Prepare a project report on the Law of supply. 4) Conduct a case discussion on the elasticity of supply.
Forms of Market and Price Determination, 4.1 Perfect competition 4.2 Monopoly and Monopolistic Competition – Meaning and Features 4.3 Price Determination under Perfect Competition	1) Conduct a discussion on 'prevalence of one price is the best test of perfect competition' 2) A visit to various markets to study the competition. 3) Write a report on the features of buyers market and sellers market.

<p>Factors of Production</p> <p>5.1 Meaning and Features of Land as a factor of production,</p> <p>5.2 Labour as a factor of production,</p> <p>5.3 Capital as a factor of production,</p> <p>5.4 Entrepreneur, Qualities and functions of entrepreneur.</p>	<p>1) A visit to SISI, DIC to study about entrepreneurship. practical will consist of:</p> <ul style="list-style-type: none"> • Preparing a project report • How to start a business • Collecting information about Permission/ Licenses required from various government agencies/ authorities • Conducting proto type market surveys using the above statistical tools • Preparing questionnaires for different types of market surveys <p>2) Prepare a project report on how to start an industry with financial details.</p> <p>3) Conduct an interview with successful entrepreneurs.</p> <p>4) Prepare a questionnaire for entrepreneurs.</p> <p>5) Find out the problems faced by informal sector labour and prepare a report.</p>
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Section II	
<p>6.1 Meaning, Scope and Importance of Statistics in Economics</p>	<p>1) Analyze the charts and diagram various statistical reports.</p> <p>2) Collect secondary data from journals, magazines and newspapers.</p>
<p>Collection and organization of data</p> <p>7.1 Collection of data – primary and secondary</p> <p>7.2 Methods of data collection – primary methods – Observation, Interview, Methods of secondary data – Census and sampling, Random sampling.</p> <p>7.3 Organization of data – Census and sampling, Random sampling.</p>	<p>1) Preparation of questionnaire for personal survey method, telephone interview and mail survey.</p> <p>2) Select sample respondents and conduct socio – economic survey, marketing survey, etc.</p> <p>3) Choose suitable sampling method to conduct the survey.</p> <p>4) Classification of collected data, tabulation of data and analysis and interpretation of data.</p>
<p>Graphical presentation of Data</p> <p>8.1 Tables – Components and Types</p> <p>8.2 Graphs – Curves, Bar diagrams,</p> <p>8.3 Pie – diagrams.</p>	<p>1) Prepare a project report using statistical techniques, graphs, etc.</p> <p>2) Prepare a bar diagram for the data collected.</p> <p>3) Prepare pie charts.</p>
<p>Measures of Central Tendency</p> <p>9.1 Mean</p> <p>9.2 Median</p> <p>9.3 Mode</p>	<p>1) Solve practical problems of mean, median, etc.</p>

Elective - I PHYSICAL BIOLOGY (Botany & Zoology) – 1st Year
(Subject Code : 90000013)

Theory	Practical
Detailed Syllabus : 1.0. General Biology 1.1. Definition and its concept 1.2. Living World: Nature and scope of Biology 1.3. Cell and Cell division: Structure of the cell, Cell division 1.4. Main features of life and its characteristics (Irritability, Homeostasis, Adaptations, Reproduction and Growth & death. 1.5. Origin and evaluation of life 1.6. Theories of evaluation of life, origin of life, special creation, spontaneous generation, Abiogenesis, Evidences of organic evolution paleontological anatomical & embryological 1.7. Study of Tissues	Study of cells and tissues
2.0. Introduction to Botany 2.1 Origin, development and scope of Botany 1.2 Classification and its need 1.3 Nomenclature 1.4. Taxonomic Hierarchy 1.5. Five Kingdom system of classification 1.6. Two Kingdom system of classification 1.7. Thallophyta, Bryophyta and Pteridophyta 1.8. Gymnosperms, Angiosperms	Study of angiosperms and gymnosperms
3.0. Vegetative Morphology of plants 3.1. Root: Root System – types, modifications of root (storage roots, velaman roots, photosynthetic roots, respiratory roots, parasitic roots, nodular roots) 3.2 Stem: Characteristics and Functions of the stem Modifications of the stems (Aerial – Tendrils, Thorns, Hooks, Phylloclade, Tuberous stems, Bulbils: Sub Aerial – Runners, Stolons, Suckers, Offsets: Underground – Rhizome, Corm, Stem Tuber, Bulb) 3.3 Leaf: Parts and Functions (Types and Modifications of leaf base, stipule, petiole are excluded) Venation Types of leaves (simple and compound) Phyllotaxy (alternate, opposite, Whorled) Modifications of leaves (tendrils, spines, scale leaves, Phyllode, reproductive leaves, trap leaves (details of Nepenthes only)	Study of the structure of a plant (root, stem, leaf)
4.0. Reproductive Morphology of plants 4.1. Inflorescence – Types (racemose, cymose, special) 4.2. Flower – Parts, Sex Distribution, Symmetry, Position of Gynoecium, detailed description of flower (perianth, calyx, corolla, aestivation, androecium – parts, fixation, dehiscence of anther, lengths of stamens, union of stamens), gynoecium – number of carpels, fusion of carpels (excluding variations under syncarpous), ovary – number of locules, placentation, types of styles, stigma.	

SECTION B - ZOOLOGY 5.0. General Biology of Living world 5.1. Main features of life and its characteristics (Irritability, Homeostasis, Adaptations, Reproduction and Growth & death. 5.2. Origin and evaluation of life 5.3. Theories of evaluation of life, origin of life, special creation, spontaneous generation, Abiogenesis, Evidences of organic evolution paleontological anatomical & embryological 5.4. Study of Tissues	
6.0 Diversity of life 6.1 Study and Classification of animals	Classification of animals
7.0. Genetics 7.1. Chromosomal basis of inheritance	
7.0 Study of Phylum: Chordata 7.1 General characters and out line classification of Chordata up to classes with typical examples. 7.2 Fishes: Distinctive features of cartilaginous and Bony fishes with typical examples. 7.3 Amphibia: Distinctive features of Urodela, Anura and Apoda with typical examples	Study of amphibians
8.0 Study of Reptiles, Aves and Mammals 8.1 Reptiles: Distinctive characters of Squamata, Rhynchocephalia, Crocodilia and Chelonia with typical examples. 8.2 Identification of Poisonous and Non- Poisonous Snakes, Poison apparatus, toxicity of Snake venom and treatment of snake bite including the first aid. 8.3 Aves: Distinctive features of Carinatae and Ratitae with typical examples. 8.4 Mammals: Distinctive features of Prototheria , Metatheria and Eutheria.	1) Study of mammals 2) study of reptiles
9.0 Anatomy of Earthworm 9.1. General characteristics of earthworm 9.2. Digestive and reproductive system 9.3. Inter-relation of earthworm with mankind	Study of earthworm

Elective - I PHYSICAL BIOLOGY (Botany & Zoology) – 2nd Year
(Subject Code : 90000013)

Theory	Practical
Detailed Syllabus : SECTION A - BOTANY 1.0. Reproduction in Angiosperms 1.1 Introduction 1.2 Microsporogenesis and development of male gametophyte 1.3 Ovule – structure, types, megasporogenesis, development of embryo sac 1.4 Pollination – Types, Contrivances of cross and self pollination. Agents of Pollination (definition with one example only) 1.5 Fertilization: Post Fertilization changes including seed structure (dicot, Monocot) and types of germination (epigeal, hypogeal & vivipary – definitions with one example)	Detailed Syllabus Study of reproduction in angiosperms in details

1.6 Fruits: – Classification; false fruits, true fruits – simple (fleshy fruits – berry, pome, pepo, hesperidium, drupe: Dry fruits – dehiscent - legume, septicidal capsule, septifragal capsule, loculicidal capsule: Indehiscent – caryopsis, cypsela, nut: schizocarpic – lomentum, schizocarp), Aggregate and multiple fruits	
2.0. Plant Taxonomy 2.1 Introduction – alpha and omega taxonomy , aspects of taxonomy, flora, herbaria, botanical gardens (RBG – KEW , IBG – Kolkatta, NBG – Lucknow), binomial nomenclature, ICBN, Types of classification, Units of classification, brief account of Bentham and Hookers classification 2.2 Study of Malvaceae 2.3 Study of Fabaceae 2.4 Study of Solanaceae 2.5 Study of Liliaceae	
3.0. Internal Organization of plants 3.1 Tissues – Types (meristematic and permanent) and Functions 3.2 Internal Structure of Dicot Root (Primary) and Monocot root 3.3 Internal Structure of Dicot Stem (Primary) and Monocot stem 3.4 Internal Structure of leaf (Dicot and Monocot) 3.5 Secondary Growth in Dicot Stem	Study of monocot and dicot stem
4.0. Genetics 4.1 Introduction to genetics 4.2 Mendel's Principles – Monohybrid, Dihybrid cross, Concept of probability in relation to Mendel's laws 4.3 Linkage and crossing over (only concept and significance) 4.4 Mutations – gene and chromosomal (only definitions of terms: – spontaneous, induced, chromosomal structural and chromosomal numerical changes)	Mendel's principle
SECTION B - ZOOLOGY 5.0. Morphology of Humans 5.1. Nutrition and respiration in man 5.2. Locomotion in man 5.3. Study of Human Skeleton	Study of human skeleton(Bone theory)
6.0 Physiology of Humans 6.1. Circulation 6.2. Osmoregulation and excretion 6.3. Nervous co – ordination 6.4. Hormonal co – ordination	1) Study of hormones 2) study of circulation and excretion(diagrammatic chart)
7.0 Reproduction, growth and development 7.1. Details of Reproduction and human development	Study of reproduction in humans
8.0 Biology in Human welfare 8.1. Aquaculture: List of animals of aquacultural importance in Tabular form only 8.2. Poultry: Poultry farming methods, Layers and Broilers, Poultry diseases (Bacterial,Viral and Fungal - Three each) 8.3. Study of diseases: AIDS, Cancer, Typhoid 8.4. Immunity system 8.5. Biotechnology (Elementary aspects) 8.6. Applications of Biology: Vermiculture and Fishery	Study of various diseases

Subject Name : ENTREPRENEURSHIP – 1st Year

(Subject code : 90000014)

Theory	Practical
Detailed Syllabus : 1.0. Entrepreneurship 1.1. Concept, Functions and need 1.2. Entrepreneurship: Characteristics and Competency 1.3. Relevance of Entrepreneurship to Socio-Economic Gain: generating National Wealth, creating Wage and Self -Employment, Micro, Small and Medium Enterprises, Optimizing Human and Natural Resource and Solving Problems in the path of prosperity, building enterprising Personality and Society. 1.4. Process of Entrepreneurship Development.	Detailed Syllabus I. Study visit by students to any enterprise of own choice. With the help of a schedule/questionnaire the students will record observation regarding – the background of entrepreneur, reasons for selecting the entrepreneurial career, starting the enterprise, the type of enterprise, the process of setting this enterprise, products/services, production process, investment made and marketing practices followed, profit or loss, growth and development, problems faced, institutions/organizations which offer support and entrepreneur's level and type of satisfaction.
2.0. Entrepreneurial Pursuits and Human Activities: 2.1. Nature, Purpose and pattern of Human Activities: Economic and Non-Economic, Need for innovation. 2.2. Rationale and Relationship of Entrepreneurial pursuits and Human Activities.	II. Preparation of a brief report based on the observations made during study-visit to an enterprise.
3.0. Acquiring Entrepreneurial Values and Motivation 3.1 Entrepreneurial Values, Attitude and Motivation-Meaning and concept. 3.2 Developing Entrepreneurial Motivation and Competency – concept and process of Achievement Motivation, Self-efficacy, Creativity, Risk Taking, Leadership, Communication and Influencing Ability and Planning Action. 3.3. Barriers to Entrepreneurship 3.4. Help and support to Entrepreneurs	
4.0. Introduction to Market Dynamics 4.1. Understanding a Market 4.2. Competitive Analysis of the Market 4.3. Patents, Trademarks and Copyright	
5.0. Project Selection 5.1. Product Identification 5.2. Project Formulation	

ENTREPRENEURSHIP – 2nd Year

Theory	Practical
Detailed Syllabus : 1.0. Entrepreneurial Opportunities and Enterprise Creation 1.1. Sensing Entrepreneurial Opportunities 1.2. Environment Scanning 1.3. Market Assessment 1.4. Identification of Entrepreneurial Opportunities 1.5. Selection of an Enterprise 1.6. Steps in setting up of an Enterprise	Detailed Syllabus
2.0. Enterprise Planning and Resourcing 2.1. Business Planning – Preparation of a Project Report 2.2. Resource Assessment -Financial and Non – Financial. 2.3. Fixed and Working Capital Requirement, Funds, Flows, Profit Ratios, Break Even Analysis etc. 2.4. Mobilizing Resources – Sources and Means of Fund, Facilities and Technologies for starting an Enterprise.	
3.0. Enterprise Management 3.1. General management: Basic Management functions. 3.2. Organizing/Production of goods and services – quality, quantity and flow of inputs. 3.3. Managing Market: Meaning, Functions of Marketing, Marketing Mix: * Product * Price * Place * Promotion (advertising and sales promotion). 3.4. Managing Finance – Sources of Long Term and Short Term Finances, Determination of Cost, Income, Calculation of Profit/Loss. 3.5. Managing Growth and Sustenance -Affecting Change, Modernization, Expansion, Diversification and Substitution. 3.6. Entrepreneurial Discipline – Laws of Land, Ecology, Consumer's Concept, Adherence to Contract and Credits.	
4.0. Industrial Relations and Personnel Management 4.1. Meaning, Source of recruitment, Internal/External recruitment procedure 4.2. Incentives, appraisal and training, Industrial relations, Industrial disputes.	
5.0. Report Writing 5.1. Guidelines 5.2. Model project reports	

Subject Name : Psychology – 1st Year

(Subject code : 90000015)

Theory	Practical
Detailed Syllabus : 1.0. Psychology Introduction : 1.1. Definition of Psychology 1.2. Methods of Psychology 1.3. Subfields of Psychology 1.4. Schools of Psychology (a) Old (b) New	Detailed Syllabus I. Study until by student to any organization for differently able person with special needs or a centre for the treatment of the mentally ill. With the help of a questionnaire the student will record observation regarding the type of treatment given, different therapies available at the organization/centre, prognosis of the patients improvement in quality of life, support for previous care given to the patient/clients.
2.0 Memory 2.1 A Theory of General Memory Function 2.2 Information Processing Theories 2.3 The Levels of Processing Theories 2.4 The Organization of Long Term Memory 2.5 Retrieval From Long term memory. 2.6 Forgetting	II. Preparation of a brief report based on the observations made during case study-visit to an organization.
3.0 Learning 3.1 Definition 3.2 Classical Conditioning 3.3 Instrumental Conditioning 3.4 Escape Learning 3.5 Avoidance Learning 3.6 Signature of Instrumental Conditioning 3.7 Cognitive Learning	
4.0 Motivation 4.1 Definition 4.2 Motives as References, Explanations and Predictions. 4.3 Theories of Motivation 4.4 A Normal of Biological Motivation 4.5 Biological Motivation 4.6 Social Motives 4.7 Self-Actualization Motivation 4.8 Frustration and Conflict of motives	
5.0 Personality 5.1 Definition 5.2 Theories of Personality	
6.0 Motivation 6.1 Definition 6.2 Etiology 6.3 Diagnosis 6.4 Clinical Features 6.5 Treatment	
7.0 Perception and Attention 7.1 Definition of Perception 7.2 Sensory Processes 7.3 Illusions 7.4 Attention	

8.0 Emotions 8.1 Definition 8.2 Expression and Perception of Emotions 8.3 Physiology of Emotions 8.4 Stress	
9.0 Intelligence 9.1 Definition 9.2 Intelligence Quotient (IQ) 9.3 Intelligence Testing	

Abnormal Psychology - 2nd Year

Theory	Practical
Detailed Syllabus : 1.0. Abnormal Psychology 1.1. Definition of Psychological Disorder 1.2. Classification of Psychological Disorder	Detailed Syllabus <p>The Main objective of the course in Psychology is to help the students establish a better rapport with their clients. A basic understanding and knowledge of this subject will enable the students to deal with each client as an individual, while also being aware of his/her unique needs. Also, due to the established mind-body connection, some patients requiring Physiotherapy have a Psychological cause as the basis of their physiological symptoms. Severe physiological symptoms requiring therapy can lead to psychological conditions in the patient. Relevant knowledge of psychology can help sensitize the physiotherapist to the needs of the client and treat the patient in a more holistic manner.</p> <p>Such a course would need to have an experimental component in the form of practical work. The objectives of the practical work are :-</p> <ol style="list-style-type: none"> 1. To give the students firsthand experience in field work with hospitals / centers catering to the psycho-physiological needs of patients. 2. To develop in the students the skill and sensitivity to deal with each patient as an individual with his or her own unique need. 3. To guide the students to prepare a project report. 4. To equip the students to make a note of patients psychological conditions in the case history of the patient. 5. To instill in the students the right values and a greater understanding of their patients.

2.0 Schizophrenia 2.1 Definition 2.2 Symptoms 2.3 Subtypes 2.4 Treatment 2.5 Prognosis	
3.0 Paranoia 3.1 Definition 3.2 Symptoms 3.3 Subtypes 3.4 Treatment	
4.0 Manic Depressive Psychosis 3.1 Definition 3.2 Symptoms 3.3 Subtypes	
5.0 Melancholia 5.1 Symptoms 5.2 Treatment	
6.0 Anxiety 6.1 Symptoms of anxiety 6.2 Difference between normal fears and anxiety disorder 6.3 Peripheral manifestations of pathological anxiety. 6.4 Classification of anxiety disorder. 6.5 Treatment	
7.0 Phobia 7.1 Definition 7.2 Symptoms 7.3 Types of phobia 7.4 Treatment	
8.0 Obsessive Compulsive neurosis (OCN) 8.1 Definition of Obsession 8.2 Definition of Compulsion 8.3 Symptoms 8.4 Treatment	
9.0 Hysterical Conversion Disorder 9.1 Definition 9.2 Clinical features (Symptoms) 9.3 Treatment	
10.0 Neurasthenia 10.1 Definition 10.2 Symptoms 10.3 Treatment	
11.0 Personality Disorders 11.1 Definition 11.2 Symptoms 11.3 Classification / Types of Personality Disorders 11.4 Anti-social Personality Disorder (i) Etiology (ii) Treatment	
12.0 Psychotherapy 12.1 Definition 12.2 Types of Psychotherapy	

13.0 Organic Psychosis 13.1 Definition 13.2 Symptoms 13.3 Types of Organic Psychosis (i) Causes (ii) Clinical Features (iii) Treatment (iv) Course and Prognosis	
14.0 Alcohol Related Mental Disorders 14.1 Definition 14.2 Etiology 14.3 Classification 14.4 Treatment and Rehabilitation.	
15.0 Epilepsy 15.1 Definition 15.2 Varieties / Types of epilepsy 15.3 Cause of epilepsy 15.4 Aggravating factors 15.5 Post-ictal disorders 15.6 Epilepsy Vs. Pseudo-seizures 15.7 Status Epilepticus & treatment 15.8 Treatment of Epilepsy	
16.0 Mental Retardation (MR) 16.1 Definition 16.2 Classification 16.3 Etiology 16.4 Diagnosis 16.5 Clinical Features 16.6 Treatment	
17.0 Frustration and conflict 17.1 Definition of Frustration 17.2 Sources of Frustration 17.3 Types of conflict	
18.0 Mental Mechanisms 18.1 Classification	

PRACTICAL (Second Year)

Introduction:

The Main objective of the course in Entrepreneurship is to generate in the students initiative, self reliance and enthusiasm so as to empower them to become entrepreneurs both in spirit and performance. A number of skills such as observation, evaluation, communication, resource mobilization and management, risk assessment, team building etc. is also to be developed in the students. Leadership qualities, sensitivity to business ethics and adherence to a positive value system are the core issues that the course highlights while presenting different concepts related to entrepreneurship.

Such a course should necessarily have a strong experiential component in the form of practical work. The objectives of the practical work are:

- 1 To introduce the students to the world of business by developing in them the core skills and competencies required for an entrepreneur.
2. To develop in the students qualities such as leadership, self-confidence, initiative, facing uncertainties, commitment, creativity, people and team building, integrity and reliability.

3. To enable the students to acquire the skills and knowledge needed for conducting surveys, collecting, recording and interpreting data and preparing simple estimates of demand for products and services.
4. To guide the students to prepare a Project Report.
5. To equip the students with knowledge and skills needed to plan and manage an enterprise through case studies conducted and recorded by the students in different fields such as resource assessment, market dynamics, finance management, cost determination, calculation of profit and loss etc.
6. To instill in the students important values and entrepreneurial discipline.

FORMAT

Total marks: 30

1. Project Report/Survey Report	10 Marks
2. Viva-Voce on PW /SR	05 Marks
3. Case Study	10 Marks
4. Problem Solving	05 Marks

1. Project Report/Market Survey Report

10 Marks

a) Project Report:

Preparation of a Project Report for an enterprise involving products/services Students may be provided adequate guidance to choose a project based on their interests and availability of information and authentic inputs in the locality. The specimen proforma of project report given in the textbook may be used for preparing the report. However, mechanical preparation of the report by filling in the information in the proforma should be discouraged.

Further, as the students will be required to appear for a Viva-voce on the basis of their projects, sufficient care should be taken by the students to prepare the report after studying the various aspects involved thoroughly. In a nutshell, the project report should lead to viable enterprise.

b) Market Survey Report

Market research is the process and technique of finding out who your potential customers are and what they want. The survey may be on products and services already available in the market or students may also conduct surveys for new products and services. The report of the survey should be organised under the following broad headings :

1. Objectives.
2. Methods and tools (interviews ,questionnaires etc.) to be used to collect information.
3. Records of data and information.
4. Analysis of data and information.
5. Interpretation and conclusion.

For example, a survey may be conducted to find out the choice of households in toiletry soap, tooth paste etc. The data may be analysed to establish a pattern that may be useful to an entrepreneur.

Guidelines for assessment of Project Report / Survey Report

1. Presentation: Format, Clarity, Use of graphs, tables and other visuals, organisation, methodical recording of data and information and general neatness of execution. 5 marks
2. Originality and Creativity 3 marks
3. Authenticity of information and correctness of calculations and general feasibility of the project/ sustainability of conclusion drawn in the survey. 2 marks

2. Viva Voce on the Project /Market Survey Report

5 Marks

The questions should establish that the report is the original work of the student and that the student has a reasonably clear understanding of the work carried out by him/her. Entrepreneurial qualities such as leadership, self-belief, creativity, originality, initiative etc. may also be assessed by asking a variety of questions related to the report.

3. Case Study

10 marks

A case study is a focused research on an organisation, enterprise, practice, behaviour or person undertaken to highlight an aspect that the study attempts to examine. For instance, a case study may be conducted on the pollution control methods being employed by an industry. Or a successful industrialist may be chosen as a subject of a case study to analyze and understand the strategies that the industrialist adopted to achieve success.

Ideally, a case study should be conducted on subjects with the objectives of bringing to the fore beliefs, practices, strategies, values etc. that have made them what they are. Such studies help us to understand the way in which great minds think and operate. We may also conduct case studies on failures; why a company collapsed, how a service lost its market etc. From both the types of case study, we learn lessons; how to do something or how not to do something. They also provide valuable insight into the processes involved in an enterprise.

A few topics are suggested for carrying out case studies :

- i) Drawing a profile of a successful entrepreneur.
- ii) Studying a public sector undertaking and highlighting its success/failure, by analyzing the factors responsible.
- iii) Studying a small scale unit in the locality to bring out the procedures and processes adopted by the unit to become a feasible business venture.
- iv) A study of competition in business by choosing two or more rivals in the market and analyzing their strengths and weaknesses.
- v) Take the school itself for a case study and analyze any two aspects of the school plant for chalking out a plan of action: infrastructure, academics, co-curricular activities etc.
- vi) A case study on a thriving fast food shop/restaurant in your locality. What makes it so popular?
- vii) A case study on the ways in which a business unit has mobilised its financial resources.
- viii) A case study on the enterprise management techniques adopted by a business house.
- ix) A case study on the marketing strategies of a successful consumer durable company.
- x) A case study on the financial management of a Public Limited Company.

- xi) A case study on any Specialized Institution that supports and guides the establishment of a small scale unit.
- xii) Studying the balance sheets of two big private companies to assess their trade and credit worthiness.
- xiii) Studying the inventory management of a large manufacturing industry to ascertain the processes involved for optimizing cost.
- xiv) Carrying out a case study on an established industrial house/company to find out the value system of the company and how it fulfils its social commitment/obligations.
- xv) Carrying out a case study on an established industry to ascertain the processes followed to reduce/prevent pollution.
- xvi) Study on environment friendly companies and their contribution to preservation.

Assessment of Case Studies

- i) Presentation: Format, accuracy, clarity, authenticity and general neatness 7 marks
- ii) Analysis and Conclusions 3 marks

4. Problem Solving

5 marks

In this session, the students will be required to solve a problem in the form of a written test. The examiner may choose any problem related to the units in class XII Text Book and set it for the class. The problem may be in the following areas :

- a. How to scan the environment to establish the feasibility of a project.
- b. Given certain figures showing the consumption pattern of a product, drawing conclusions that have a bearing on similar products.
- c. Carrying out market assessment for a given product/service to ascertain the feasibility factor.
- d. Assessment of Working Capital.
- e. Calculation of total cost of production.
- f. Calculation of break-even point.
- g. Determining location of a manufacturing unit.
- h. Problems in inventory control (calculation of the Economic Order Quantity and carrying out ABC analysis).
- i. Applying Pricing methods to determine the price of a product or service.
- j. Applying promotion mix to plan a sales campaign for a product or service.
- k. Working out a simple budget for a given task or job.

Assessment of Answers

The examiner may prepare five problems which are solved by him/her before they are presented to the students. The student may choose anyone of the problems and solve it, showing the different steps/different reasons involved in the solution. If the problem does not involve actual calculations, it may not have anyone correct answer. So weightage should be given not only to the final answer but to the entire process of problem solving that the student has followed. Originality and innovative spirit should be rewarded. The students should not be penalized for spelling errors, grammatical mistakes etc. as long as the answer is coherent. Where definite formulas are involved, accuracy should be given due weightage.

LIST OF SUGGESTED REFERENCE BOOKS

01. Entrepreneurship – Class XI – C. B. S. E., Delhi.
02. Entrepreneurship – Class XII- C. B. S. E., Delhi.
03. Udyamita (in Hindi) by Dr. M M.P. Akhouri and S.P Mishra, pub. by National Institute for Entrepreneurship and Small Business Development (NIESBUD), NSIC-PATC Campus, Okhla.
04. Trainer’s Manual on Developing Entrepreneurial Motivation, By M.M.P. Aukhori, S.P. Mishra and R. Sengupta, Pub. by (NIESBUD), NSIC-PATC Campus, Okhla.
05. Behavioral Exercises and games – manual for trainers, learning systems, by M. V. Despande, P. Mehta and M. Nandami.
06. Product Selection by Prof. H.N. Pathak, Pub. By (NIESBUD), NSIC-PATC Campus, Okhla.
07. Entrepreneurial Development – Dr. S. Moharana and Dr. C.R.Dash, Pub. by RBSA Publishers, Jaipur.
08. Entrepreneurial Development by S.S.Khanna, Published by S.Chand & Company Ltd., Ram Nagar, New Delhi.
09. Entrepreneurial Development by C.B. Gupta and N.P.Srinivasan, Publisher Sultan Chand & Sons, 1992.
10. Entrepreneurship Development – Principles, Policies and Programmes by P. Saravanel, Publishers Ess Pee Kay Publishing House, Madras.
11. Entrepreneurship, Growth and Development, by Rashi Ali, Pub. by Chugh Publication and Strech Road, Civil Lines, Post Box No. 101, Allahabad-211991.
12. Entrepreneur and Entrepreneurship Development and Planning in India, by D.N.Mishra, pub. by Chugh Publication, Allahabad.
13. Aoudhogik Disha Nirdesh (in Hindi) Pub. by Centre for Entrepreneurship Development, M.P. (CEDMAP), 60, Jail Road, Jhangerbad, Bhopal-462008.
14. Entrepreneur, Industry and Self-employment Project, Part-1 and 2(in Hindi), Pub. by Centre for Entrepreneurship Development, M.P. (CEDMAP), 60 Jail Road, Jhangerbad, Bhopal-462008.
15. Small Scale Industry & Self-Employment Projects, Part-1 and 2 (in Hindi), Pub. by Centre for Entrepreneurship Development, M.P. (CEDMAP),60 Jail Road, Jhangerbad Bhopal.

Magazines

01. Udyamita Samachar Patra,(Monthly, Hind), Pub. by Centre for Entrepreneurship Development, M.P.(CEDMAP), 60 Jail Road, Jhangerbad, Bhopal-462008.
02. Science Tec. Entrepreneur (A Bi Monthly Publication), centre for Enterprenurship Development, M.P. (CEDMAP), 60 Jail Road, Jhangerbad , Bhopal -462008.
03. Laghu Udhyog Samachar.
04. Project Profile by DCSSI.
05. Project Profile by Pub. Centre for Enterpreurship Development, M.P. (CEDMAP), 60 Jail . Road, Jhangerbad, Bhopal-462008.

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 frictions 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	Experiment on Refraction of light using a prism

8.5. Refraction at single curved surface 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 H ₂ , N ₂ and O ₂ .	

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 <u>Part A – Current Electricity</u> 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. <u>Part B – Magnetic effects of electric current</u> 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	1) Solve numericals on Ohm's law 2) Experiment on wheatstone's bridge

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

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. 5.5. Filtration 5.6. Converting presentations to PDF files. 5.7. 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: 1.0. Logarithms 1.1. Introduction to logarithms 1.2. Laws of logarithm, characteristics and mantissa	Practice: 1. At least 5 to 10 exercises per chapter 2. One home/class assignment per chapter
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 4.5 Derivative 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

Subject Code –30440018

Subject Name : Interior and Exterior Design – 1st Year

Art Basic Design & Drafting

Introduction to Interior & Exterior Design

Introduction to design – Definition of art sense of beauty benefits offered by interior & exterior design and its effects ,role and importance of factors influencing interiors and exteriors: -family, individual, corporate, commercial needs, preferences, availability & suitability of materials, principles of design & budget & financial constraints.

Fine Arts Principles & Elements of Design:

Introduction to design

- a) Structural design – definition characteristics of structural design principles of design.
- b) Decorative design – definition characteristics with examples
- c) Principles of Design – Line, Form, Space, Texture, Colour, Balance, Harmony Function, rhythm, Emphasis and Unity.
- d) Lettering Scale – Usage of lettering scales.
- e) Balance _ definition types, formal balance ,types of formal balance bi - symmetric & obvious informal balance.
- f) Harmony – definition, types, aspects of harmony, lines, shape ,size, texture & colour
- g) Rhythm – definition methods of obtaining.
- h) Emphasis _ definition how to emphasize grouping of objects ,using contrasting colours using decoration ,having sufficient plain background ,using unusual lines, shapes, lines role of emphasis use of emphasis in daily life.

Electricals & Lighting, Fittings & Fixtures :

Role of lighting and also use of various fixtures in Bathrooms kitchen etc like Sanitary Doors
Role of lighting in interior design .Quality and character of light – its influence on contour and texture. Types of lighting system & their proper application uses & disadvantages. Alternative lighting system and their application. Proper Safety and Illumination standards for specific spaces. Arrangement of space in relation to the performance. Usage of illumination for Special Halls , Commercial Conferences ,Corridors & Open Spaces like Roof Gardens etc.,Usage of Spotlights & Special lights for creation of Art & Artifacts. Points to be considered for while designing special residential houses, design of fixtures apartments , work homes mezzanine rooms.

Cost Analysis :

Preparing final costing of any project Correspondence regarding budgeting contract laws, Knowledge of professional ethics. Maintenance of Excellent Client Relationship. Documentation & interpretation of design information

Plumbing: -

Proper usage of Plumbing facilities for residential/ commercial establishments. Sanitary fittings- wash basin, sink, w.c.'s and their accessories like showers taps pipes etc..., Hardware fittings uses of various types for enhancement of beauty & aesthetics Fire proofing fire fighting. Dampness – remedies

False Ceilings-

Usage and importance of false ceilings, Partition walls- Usage of and types of partitions used. Proper Use of Air Conditioning for effectiveness cooling effect. Floor & Wall finishes, Wooden Joineries & furniture detailing .Proper use of Soft furnishings, Right use of right furniture in the right place – Use of Art & accessories – Optimum utilization of space and better living environment.

Working knowledge of :

Working knowledge of the use of modern concepts like Vastu Shastra, Fengshui & other modern technologies including Fengshui techniques like form school ,basic Compass Formula, symbolic Fengshui, East House- West House Formula, mansions Kua Formula (pa Chai), Luo- Pan ,Empty line danger alignments ,Time dimensions, introduction to Xuan Kong Fengshui flying stars , Time taboos for renovation ,Great sun position formula ,Annual Flying stars knowledge of wind & water geomancy.

Colour Concept & Applications**Theory Of Colour**

Importance of Colours . Colour wheel, tints & shades. Introduction to colours – Dyes, pigment & spectral colours: Classes of colours according to Prang systemprimary secondary binary intermediate tertiary quaternary (any one colour scheme–(17). Dimension of colours, value of Preference, Trend, Tradition Area , Space Creation. Hue names of colours, coolness & warmness, advancing and receding colours Value- lightness & darkness ,tint & shade, how to change the value. Use of Colours in Exteriors . Use of Colour mixing methods by use of computers. Critical review of colours scheme .Factors influencing colour selection. Psychology of colour on human moods & feelings effect on shape & size of the room, activity, orientation & its effects. Interaction between light & colour Preference of colour and harmonies in interior.Perception and sciences of vision. Colour conditioning, Colours in interiors- principles of design in use of colour, Application of designing batik, tie & dye in house décor, Rangoli& Alpana.Use of art in every day life its use importance colour as an important element of art Practicals Colour wheel-its importance. Tones-tints & shades.Colour schemes on computers. Colour relations.Murals & Collage.Relationship of colour with lighting surroundings, orientation , distance and area. Application of colour texture patterns finishes materials and their psychological effect on interiors.Visual aspects of colour with special reference to enclosed spaces. Comprehensive colour planning for interiors and suggestive colour schemes to create the s desired effect for different functional areas.Making of Projects and models on the use of Colour Layouts their effects . attend workshops & seminars arranged by Berger Paints etc renowned Multinationals & Fair organizers to understand & collect samples & project materials. Also use of search engines on Web for finding data related to Colour .Draw & present the use of colour in various rooms according to age budget size etc , upholstery furnishing Fittings . To visi t si tes for informat ion & use of proper colour schemes for var ious homes , of fices , resident ial plazas , spa areas

Display Window Dressing & Accessories

Types of display and their scores, display as a part of total advertisement effort. Board

Classification- Store display in retail chain malls retail outlets, exclusive showrooms , shopping malls, entertainment houses , etc., window display exhibitions display, shelf product display for impulsive sales, product launch display. Simple Stands, boards light fittings & mechanical devices used in display. Colour & light in display, light and its effect on colour .Light as a means of highlighting or suppressing any feature ,different types of light sources and their proper uses. Planning designing. Designing displays for shop windows selling various products. Use of ethnic styles- use of earthen & classy wares to enhance effects. Display Lighting. Trail Selection of material for display. Space Organisation, Role of Sculpture & Murals indoors and outdoors. Mechanism of display apparatus ,display of lighting effects created, trail selection of materials for display ,space organisation ,preparation of graphic display material, role of sculpture & mural in and out of building.

Practicals

1. Store display window ,display exhibition ,merchandising display ,shelf product display for impulsive sales, product launch display,
2. Colour Effect – on Windows ,Shelves Racks Display Counters /hanging racks
3. Effect of seasons – Window displays/racks display counters
4. Use of various themes, Occasions, Pujas, Important festivals, Valentine's day Xmas /world cups , Any important event ,effect of movies music/international events & activities. etc
5. Display of product at Strategic Location at eye- level proper product Merchandising
6. Use of ribbons ,various textiles dry flowers laces curls proper backdrops for windows shelf using proper shapes sizes & use of light & colour .
7. New Product launch- for eye catching impact, Use of right materials, frills special lights & backgrounds backdrops for right ambience

Subject Name : Interior and Exterior Design – 2nd Year

Design of Furniture, Furnishing & Fittings

Design, size, selection of materials and finishes, production techniques. arrangement of and appreciate aesthetic value in design. Use of new technology & materials. Study of basic furniture dimensions based on anthropometric measurements, basic materials used for furniture-types of wood, processed wood (block boards) laminates veneers metals fiberglass plastic cane. History of furniture styles-Renaissance to Modern, with emphasis on Indian types. Detailed knowledge of European furniture styles, . Furniture finishes, types natural & synthetic –varnishes, polishing, lacquering ,melamine painting, staining effective cost management &thorough knowledge of maintenance. Colours in interiorsprinciples of design in use of colours, relationship of colour with lighting surrounding orientation distance and area, colour scheme for interiors (review).Detailed knowledge of Joinery as applied to furniture. Identification specification & standardization in design. Documentation & interpretation of design information. Costing & budgeting laws. Professional ethics & relationship. Anthropometrics & Ergonomics Fundamental factor in design,Elementary anatomy and human body measurement. Environmental controlled factors in controlled space,Ergonomic assessment of typical design.

Appreciation of Visual Arts:

Understanding of Symbolism, Analysis of other forms of arts ,Values of Indian thought and philosophy in relation to visual communication medium.

Practical

Study Of Basic Furniture Dimensions Based On Anthropometric Measurements Arrangement of space in relation to the performance. Knowledge & proper use of wooden joineries & furniture detailing. Various kinds & types used in residential apartments:- Beds, dining tables, Study Tables, Centre Tables, Side Boards, Cupboards, Wall cupboards Dressing Tables kitchen tables store cupboards bathroom closets- Plan elevation & Isometric view with details drawing & estimation with knowledge of various finishes. Rendering in pencil , ink & colour . Perspective drawing – one point, two point Sectional elevation of interiors and elevation of furniture units. Project- Presentation of complete detailed schematic drawing of an interior with measurement (using Auto Cad –optional). Visits to furniture factories and residences. Market survey of furnishing materials finishes, exhibitions/seminars/forums on latest products

History of Interior Design

Furniture history from ancient days to the modern age. Traditional interior design- Hindu, Indosarcsenic, other eastern cultures & African (Egypt).Impact of Modern Art , Architecture, science & technology on interior design. Influence of religious , cultural social and other influences on art forms. Planning flow of space circulation space requirement abstract & functional spaces. Drawing line plan & elevation of single rooms apartments placement of furniture. Perspective of single rooms in black & white & colour .Interior planning .

- a. Floor composition –furniture arrangement of various areas with emphasis on space organisation and circulation(inter-room & intra room)
- b. Wall compositions- types selection ,cost budget choice , care,& maintenance .
- c. Ceiling Composition- Care cost selection , budget & maintenance.

Project work: Projects for Internal Assessment

1. Project work on types of furniture from renaissance to modern age.
2. Visits to sites & furniture factories
3. Furniture design making-various stages as project work
4. Planning furniture for spaces both functional and aesthetic
5. Collection of various brochures from various manufacturers
6. Furniture planning for single room apartments & usual homes
7. Planning furniture by utilizing room space provided

Exterior Design

Role of styles colours design on the exteriors. Use of various materials for maintenance & yet glossy look. Dampness & rifts in the wall. Elimination of noise pollution effects. Minimal effects of weathering. Creation of new novel looks, Use of granites tiles & marbles on the exteriors Heat repelling paints & decorations , use of Plants & other artifacts to decorate the exteriors. Project work: Projects for Internal Assessment –

1. File work on types of Exterior
2. Models on various designs in Exteriors
3. Design of modern flats – with due consideration on noise pollution maintenance cost weathering etc
4. Various paints to be used
5. Various structure built
6. Proper utilization of natural resources for beautification
7. Exterior for commercial complexes , retail outlets, chain stores, gyms spas etc.,

Furnishing & Fittings

Design & layouts for furnishing. size, selection of materials and finishes with proper working knowledge of newer technologies & use of Vastu Shastra & Fengshui. Production techniques and criteria arrangement of, appreciate aesthetic value in design ,use of new technology & materials. Applications to various raw materials used in furniture wood, metal furnishings upholstery glass etc. fundamental factor in design, elementary anatomy and human body measurement , environmental controlled factors in controlled space,ergonomic assessment. Use of new technology & materials e.g. Types of Curtain , rods, hooks, tapes, rings etc.

Materials of curtains& upholstery – Types & styles for urban & semi urban -e.g. springs & construction detailing. File work of samples to be collected with price, width & types to be used for upholstery & drapes. Door knobs, Locks handles fittings of doors & windows Switches – types to collect, brochures to be taken, prices, Built in furniture. Furnishings & fittings of different upholstery. Use of different trends & styles. Curtains, drapes ,paintings & beautiful show pieces statues, small water falls. Floor coverings light fixtures, vases, cultural artifacts, - their Cost, selection, care and maintenance. Creative use of Fittings & fixtures to appeal to the eyes, novelty with various materials cost effective.

Appreciation of Visual Arts:

Understanding of Symbolism, Analysis of other forms of arts ,Values of Indian thought and philosophy in relation to visual communication medium.Sybmolism in Arts ,Religious Cultural & Cross cultural ,Social Current trends influence on Art Forms & their effects. Communication graphics of design ideas.

Electricals & Lighting – Fitting & Fixtures:

Role of lighting .Use of various fixtures in various interiors (residences offices & commercials spaces. Role of lighting in interior design Quality and character of light – its influence on contour and texture. Use of Natural Lights Sunlight & proper conservation of artificial light. Types of lighting system & their proper application uses & disadvantages. Alternative lighting system and their application. Proper Safety & Illumination standards for specific spaces. Arrangement of space in relation to the performance .Usage of illumination for Special Halls , Commercial Conferences Corridors & Open Spaces like Roof Gardens etc.,Usage of Spotlights & Special lights for creation of Art & Artifacts Points to be considered for while designing special residential houses. Design of fixtures apartments , work homes mezzanine rooms. Market survey of basic materials used for finishing & furnishing of interiors with Project work by attending seminars fairs & exhibitions.

Furnishing Fittings & Accessories.

Practicals

Use of furnishing& Fittings

Its uses & importance, types ,Furnishing for walls floors & furniture. Aesthetics involved –role of accessories – types according to choice & budget , urban high style to middle income group , selection, cost ,care & maintenance .Importance of gadgets & fittings with interior schemes. Use of modern technologies & utilities proper utilization of gadgets & artifacts for proper effect.

Textiles used for furnishing:-

Knowledge of types of textiles & leather natural & synthethic-purpose & design use of – maintenance care & cost .Quality of printing ,designing, patterns, dyeing techniques, textures & mix & matching textiles to create the right effect. To know the cost effectiveness & maintenance & washing related issues & problems.

Curtain & upholstery fittings-

Drapery materials, Curtain-fittings rods etc Curtain fittings. Window dressing styles, lining materials trims & tiebacks. Venetian Blinds.

Use of Art & accessories

Upholstery fittings, Paintings, Floor coverings, Light fixtures Vases, artifacts selection arrangement , care & maintenance. Optimum utilization of space and better living environment Proper use of Soft furnishings, Utility articles-wrapping paper ,gift-wrappings . Textiles stenciling fabric painting right .use of right furniture in the right place. Use of colours in interiors factors influencing colour selection shape size of rooms activity orientation, preference & colour harmonies in interior. Indoor Plants Role of indoor Plants/ bonsai/artificial plants & flowers in decoration in commercial establishments, residential homes , apartments , complexes, corporate houses, retails malls, retail chain outlets, eateries, restaurants ,food joints, cafes, bars, pubs, meeting rooms and offices . Proper & effective usage of space colour texture creation of beauty & radiance. Proper use & display arrangements-with emphasis on Lighting, Space organization materials etc. Scope of display techniques and related factors including light, colour form & space. Communication graphic of design ideas. Role of indoor plants in decoration both indoors & outdoors. Indoor gardening-brief introduction.- selection of suitable plants & their care & proper maintenance. Scope of display techniques and related factors including light ,colour form, and space. Field trips, seminars , models , project work (Internal Marking) to imbibe proper knowledge acquired.

To visit construction sites, residential houses visits to exhibitions ,seminars & create models .Also to read materials both in print and through internet available in various international & monthly publications basically to gather knowledge & information and make project report files to be assessed internally using the techniques like Structural & Decorative design using principles of Design: Line, Form, Space, Texture, Colour, Balance, Harmony Function, Rhythm ,Emphasis and Unity, Harmony –its effectiveness in daily life.

1. Project work on types of furnishings used from renaissance to modern age.
2. Visits to sites & furnishing units
3. Creating new furnishing design making-
4. Collection of various brochures /samples from various manufacturers create project reports.
5. Furnishing to plan for single room apartments & residential homes
6. Planning to furnish Retails outlets ,entertainment areas etc.,

Subject - Building Drawing and CAD - 1st Year

Code No – 30440002

Theory	Practical
A] Building Drawing	1 Year
Chapter 1: Introduction to Drawing 1.1) Different Drawing Instrument and their use 1.2) Letters its types, Sizes and its use in Drawing 1.3) Convention of different lines 1.4) Giving dimensions 1.5) Scales and its uses 1.6) Study of IS 962	Practical 1) Prepare Sheet on lettering 2) Prepare Sheet on lines 3) Prepare Sheets on Geometrical Construction 4) Prepare Sheets on Conventional Sign and Symbols
Chapter 2: Orthographic Projection 2.1) Introduction to orthographic projections 2.2) First Angle Projections Method 2.3) Third Angle Projections Method 2.4) Drawing orthographic Projections of simple pictorial view	Practical 1) 1 st Angle Projections ----- 2 Solids 2) 3 rd Angle Projections ----- 2 Solids
Chapter 3: Isometric View 3.1) Method of Preparing Isometric Views 3.2) Isometric View of Rectangular Objects 3.3) Isometric View of Circular Objects 3.4) Isometric View of Building	Practical 1) Isometric View of Rectangular Objects 2) Isometric Vies of Circular Objects 3) Isometric View of Building
Chapter 4: Building Drawing Dimensions and Details of Foundation C/S. DPC, Different Types of Door and Windows, Roof Trusses, Flooring C/S, Staircase, Brick Masonry, Lintel, Arches, Chajja, C/S details of RCC Chajja, Lintel, Beam, Footing, Column, Slab, Pardi, Staircase etc.	Practical Detailed Drawing of Foundation C/S. DPC, Different Types of Door and Windows, Roof Trusses, Flooring C/S, Staircase, Brick Masonry, Lintel, Arches, Chajja, C/S details of RCC Chajja, Lintel, Beam, Footing, Column, Slab, Pardi, Staircase etc.
Chapter 5: Building By Laws and Standard Norms 3.1) Definitions of Plot Area, Plinth Area, Built up Area, Carpet Area, Floor Space Index (FSI) 3.3) Permissible Built up Area for Residential Bldg., Public Building 3.4) Definition of Marginal Distance and their necessity, Normal Marginal Distances provided for Residential Buildings 3.5) Definition and Necessity of Building Line, Development Line 3.6) Min Dimensions for following 3.6.1) Plinth height, Sill height, Head Room in Residential Bldg, Public Buildings, Mezzanine floor, Basements and stilts for car parking 3.7) Minimum Dimensions of: Living Room, Bed Room, Master Bed Room, W.C. Bath, Toilet. 3.7.1) Min. Width for passage and Balcony 3.8) Rules for Window Opening 3.9) Min. width of step and Landing, Head Room, Thumb Rules for fixing Rise and Tread. 3.9.1) Permissible Height of Pardi, of Building as per FSI and Road Width	Practical 1) Student to Draw for A Residential. Bungalow (Load Bearing) i.e. minimum 2 Bedrooms (one Bed room with attached Toilet), 1Hall, 1Kitchen, Veranda, Staircase, Toilet block, and Car Parking. a) Plan, b) Elevation c) Two sections d) Schedule of door and window e) Site plan, f) Area statement, g) Construction notes. h) Schedule of finishes

Chapter 6: Development of Line Plan of a Building 4.1) Symbols and notations as per BIS 696 in Civil Engg. Drawing. 4.2) Preparing Line Plan of Building, necessity of preparing line plan. 4.3) Development of Plan of Residential Building having living Room, Kitchen Room, Bed Room, Bath room and w.c. with slab. Draw to scale – Plan, Elevation Sections in 3 directions 4.4) Working drawings and its necessity.	2) Draw tracing of above drawing 3) Prepare ammonia sheet 4) Prepare a working drawing for Staircase, Toilet block and kitchen
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Subject - Building Drawing and CAD - 2nd Year

Code No – 30440002

Theory	Practical
B] Computer Fundamental	6 Month
1] Fundamentals Of Computer Introduction Components of PC The system Unit Front part of system Unit Back part of system Unit CPU Memory of computer Monitor Mouse, Keyboard Disk, Printer, Scanner, Modem, Video, Sound cards, Speakers	List of Practical 1. Working with Windows 2000 desktop ,start icon, taskbar, Recycle Bin, My Computer icon ,The Recycle Bin and deleted files Creating shortcuts on the desktop 2. The Windows 2000 accessories, WordPad – editing an existing document, Use of Paint – drawing tools The Calculator, Clock 3. The Windows Explorer window, concept of drives, folders and files? Folder selection techniques, Switching drives, Folder creation, Moving or copying files, Renaming, Deleting files and folders 4. Printing, Installing a printer driver, Setting up a printer, Default and installed printers, Controlling print queues, Viewing installed fonts, The clipboard and 'drag and drop', Basic clipboard concepts Linking vs. embedding,
2] Introduction To Windows 2000/Xp Working with window Desktop Components of window Menu bar option Starting window Getting familiar with desktop Moving from one window to another Reverting windows to its previous size Opening task bar buttons into a windows Creating shortcut of program Quitting windows	5. Moving through a Word document menu bar and drop down menus toolbars 6. Entering text into a Word 2000 document, selection techniques Deleting text 7. Font formatting keyboard shortcuts 8. Paragraph formatting Bullets and numbering 9. Page formatting What is page formatting? Page margins Page size and orientation Page breaks, Headers and footers 10. Introducing tables and columns

<p>3] GUI Based Editing, Spreadsheets, Tables & Presentation</p> <p>Application Using MS Office 2000 & Open Office.Org Menus Opening, menus, Toolbars, standard toolbars, formatting toolbars & closing Quitting Document , Editing & designing your document Spreadsheets Working & Manipulating data with Excel Changing the layout Working with simple graphs Presentation Working With PowerPoint and Presentation</p>	<p>11. Printing within Word 2000 Print setup Printing options Print preview</p> <p>12. Development of application using mail merge Mail merging addresses for envelopes Printing an addressed envelope and letter</p> <p>13. Creating and using macros in a document</p> <p>14. Creating and opening workbooks Entering data</p> <p>15. Navigating in the worksheet Selecting items within Excel 2000 Inserting and deleting cells, rows and column Moving between worksheets, saving worksheet, workbook</p>
<p>4] Introduction To Internet</p> <p>What is Internet Equipment Required for Internet connection Sending &receiving Emails Browsing the WWW Creating own Email Account Internet chatting</p>	<p>16. Formatting and customizing data</p> <p>17. Formulas, functions and named ranges</p> <p>18. Creating, manipulating & changing the chart type</p> <p>19. Printing, Page setup, Margins Sheet printing options, Printing a worksheet</p> <p>20. * Preparing presentations with Microsoft Power Point. Slides and presentations, Opening an existing presentation , Saving a presentation</p>
<p>5] Usage of Computer System in various Domains</p> <p>Computer application in Offices, books publication data analysis ,accounting , investment, inventory control, graphics, database management, Instrumentation, Airline and railway ticket reservation, robotics, artificial intelligence, military, banks, design and research work, real-time, point of sale terminals, financial transaction terminals.</p>	<p>21. Using the AutoContent wizard ,Starting the AutoContent wizard, Selecting a presentation type within the AutoContent wizard Presentation type Presentation titles, footers and slide number</p> <p>22. Creating a simple text slide, Selecting a slide Layout Manipulating slide information within normal and outline view, Formatting and proofing text, Pictures and backgrounds, drawing toolbar, AutoShapes, Using clipart, Selecting objects, Grouping and un-grouping objects, The format painter</p>
	<p>23. Creating and running a slide show, Navigating through a slide show, Slide show transitions, Slide show timings. Animation effects</p> <p>24. Microsoft Internet Explorer 5 & the Internet Connecting to the Internet The Internet Explorer program window, The on-line web tutorial Using hyper links, Responding to an email link on a web page</p> <p>25. Searching the Internet, Searching the web via Microsoft Internet Explorer, Searching the Internet using Web Crawler, Searching the Internet using Yahoo, Commonly used search engines</p>

<p>6] Information technology for benefits of community Impact of computer on society Social responsibilities Applications of IT Impact of IT Ethics and information technology Future with information technology</p>	<p>26. Favorites, security & customizing Explorer Organizing Favorite web sites Customizing options – general, security, contents, connection, programs, advanced 27. * Using the Address Book Adding a new contact Creating a mailing group, Addressing a message, Finding an e-mail address 28. Using electronic mail, Starting Outlook Express Using the Outlook Express window, Changing the window layout, Reading file attachment, Taking action on message-deleting, forwarding, replying 29. Email & newsgroups, Creating and sending Emails Attached files, Receiving emails, Locating and subscribing to newsgroups, Posting a message to a newsgroup 30. Chatting on internet, Understating Microsoft chat environment, Chat toolbar</p>
<p>C] Computer Aided Designing and Drafting</p>	<p>6 Month</p>
<p>1.0 CAD Software Meaning, various CAD software available in the market AutoCAD, Felix Cad, Auto Civil, 3D Max; etc.) Starting up of CAD, CAD Window, Tool bar, Drop down menu, Command window, Saving the drawing. Introduction of Graphic screen.</p>	<p>Practical related Creating New file, Closing Drawing, Saving Drawing, Startup Methods, Modes in AutoCAD, Use of Function Keys, Use of Keyboard and Mouse in AutoCAD Practice.</p>
<p>2.0 CAD Commands WCS icon, UCS icon, co-ordinates, drawing limits, grid, snap, ortho features. All Drawing commands, line, circle, polyline, multiline, ellipse, polygon etc. All Editing commands – Copy, move, offset, fillet, chamfer, trim, lengthen, mirror, rotate, array etc. Working with Layers, Block, hatches, fills, dimensioning, text etc.</p>	<p>Practice on Small Drawing Objects using Commands in Draw Menu Practice of Editing command on above drawing objects, Dimensioning Drawing, Creating Title block, Area Statement and Schedule of Opening using Text in AutoCAD,</p>
<p>3.0 Use of Cad software for practice of: Generation of line plan, Detailed Plan, elevation, section, site plan, Area statement and print commands Generation of 3D view using 3D Modeling commands and 3d Operation commands, Creating 3D of Building Introduction to Auto desk Architect , 3D Max</p>	<p>Drawing Plan, Elevation, Section, Site Plan in AutoCAD Creating 3D Model of Building and Generating required 3D view from all sides. Other CAD Practical based on the Theory.</p>

List of Books

Building Drawing

- 1] Malik, R.S. & Meo G.S. Civil Engg Drawing Delhi: New Asian Publishing
- 2] Shah P. J. Engg. Drawing – 1 Ahmedabad : D. J. Shah Publishing
- 3] Bhat N. D. Engg. Drawing Anand : Charotor
- 4] Gurucharan Singh Civil Engg. Drawing Delhi : Standard Publishers
- 5] Sane Y.S Building planning
- 6] Shaha Kale & Patki Building Drawing
- 7] Mackay W. B. IS962 Beuro of standards India (ISI)

Computer Fundamental

- 1] Vikas Gupta Comdex Computer Course Kit First Dreamtech
- 2] Henry Lucas Information Technology for management 7Th Tata Mc-Graw Hills
- 3] B.Ram Computer Fundamentals Architecture and Organisation Revised 3rd New Age International Publisher

CAD Books

- 1] Reference Manual of AutoCAD AutoDesk
- 2] Reference Manual of Felix cad Felix CAD
- 3] Reference Manual of Intel CAD
- 4] Reference Manual of Auto Civil
- 5] Reference Manual of 3D-Max

List of Tools and Equipment

A] General Class room

Sr	Name of Item	No.
1	Steel lockers 8 compartments with individual lockers (1980 x 910 x 480 mm)	4
2	Chair with writing pad	25
3	Steel almari with self 6.5' x 3' (18 gauge)	2
4	Steel table 4' x 3'	2
5	Teacher chair	2

B] For Building Drawing Practical

Sr	Name of Item	No.
1	Drawing Board	25
2	Drawing Table	25
3	Mini Drafter	25
4	Triangular Scale	10
5	Glass board 8' x 4'	2

C] For Computer Fundamental and CAD Practical

Sr	Name of Item	No.
1	Computer System P4 with accessories Complete with license OS. compatible for- to run AutoCAD 2010 and Windows 7 OS.	5+1
2	Plotter- HP Design Jet 500 latest model	1
3	Scanner	1
4	Computer table	5+2
5	Chair for computer	10+2
6	Laser Printer	1
7	AutoCAD 2010 or above Software	1
8	M. S. Office Software	1

Subject Code –30440019

Subject Name : Construction Material and Services – 1st Year

Materials & Services

Building Materials used in Interiors:

Basic building components:-

Foundation Types of bricks , Stone ,Wood Glass ,Plastic ,Ceramic, Plaster , Leather And Rexin.

Openings-

Meaning & uses and types of Arches, Lintels Doors & Windows, Floors roofs, Stairs & staircases.

Lighting Design – Light source & fixtures, Water supply & Drainage system Landscaping,

Airconditioning , False ceiling,

Flooring-

Use & knowledge of types of Textiles & Carpets ,Wall Coverings And Flooring, scaffolding.

Use of Paint & Pigments, Carpentry & Designers tools, masons tools, electrical tools.

False Ceiling Tinsmithing, Sound proofing Materials, Acoustics.

Accessories-importance types selection care & maintenance.

Decorative plants both natural & artificial - to enhance open spaces in Exteriors – Use of

Fountains, Sculptures, gardens, ponds, water surfaces to enhance beauty of the site e

To know to find out the proper value of materials a& calculate the cost of materials from layout to completion.

Use of current technology & materials.

Building Materials : -

To have detailed knowledge of : -

1) Stones

1.1 Rock and its classification.

1.2 Characteristics of a good building stone.

1.3 Properties and occurrence of various building s tones, their use/ trade names and their units of purchase.

1.4 Aggregate - its meanings, classification and use. Sieve analysis trade/commercial name and units to purchase of various types of aggregates.

2) Clay products : (Bricks , Ti les & Terra - cotta)

2.1 Bricks

2.1.1 Use of bricks .

2.1.2 Classification of bricks as per I .S.L NO. 1077 (Revised) .

2.1.3 Field testing of bricks - for dimension, texture, colour , shape, water absorption and efflorescence

2.1.4 Shapes of bricks used for special purpose.

2.1.5 Stacking & counting of bricks .

2.1.6 Units of purchase.

2.1.7 Manufacture of modular brick s Fl y ash bricks.

2.2 Ti les

2.2.1 Clay Flooring tiles and Roofing tiles .

2.2.2 General properties & uses of c lay roofing tiles .

2.2.3 General properties & uses of glazed earthenware t i les , their properties & uses .

- 2.3 Terra – cotta
 - 2.3.1 Meaning - ear then ware & stone ware.
 - 2.3.2 Proper ties and uses of ear then and stone wares.
 - 2.3.3 Soil Waste pipes.
 - 2.3.4 Water closets .
 - 2.3.5 Gull y t raps .
- 3) Cement
 - 3.1 Meaning
 - 3.2 Types of Cement , proper ties & uses.
 - 3.3 Field test for ordinary Port land cement .
 - 3.4 Units of purchase.
 - 3.5 Storage of cement : Requirements of godown for cement . Method of stack ing.
- 4) Lime
 - 4.1 Meaning
 - 4.2 Quick Lime and Hydrated lime.
 - 4.3 Classification of lime as per I .S. I . 721 (Revised) properties and uses .
 - 4.4 Local /Trade/Commercial names and units of purchase.
 - 4.5 Methods of storage of different types of l ime.
 - 4.6 Field testing of Hydraulic lime.
- 5) Concrete and mortar
 - 5.1 CONCRETE
 - 5.1.1 Meaning
 - 5.1.2 Cement concrete
 - 5.1.3 Lime concrete
 - 5.1.4 Surkhi concrete
 - 5.1.5 Composite mortar concrete
 - 5.1.6 Reinforced brick l ime concrete
 - 5.1.7 Pre - cast concrete
 - 5.1.8 Pre - stressed concrete.
 - 5.2 MORTAR
 - 5. 2 .1 Meaning
 - 5. 2 .2 Lime mortar
 - 5. 2. 3 Cement mortar
 - 5. 2. 4 Surkhi mortar
 - 5. 2. 5 Mud mortar
- 6) Timber and Allied products
 - 6.1 TIMBER
 - 6.1.1 Meaning
 - 6.1.2 Soft wood and hard wood
 - 6.1.3 Characteristics of a good timber .
 - 6.1.4 Qualities of seasoned timber .
 - 6.1.5 General defects in timber , their causes and remedial measures .
 - 6.1.6 Preservation of timber , names of preservatives and their uses.
 - 6.1.7 Common India timbers , their properties , availability & use
 - 6.1.8 Storage of timber
 - 6.1.9 Market form of timber & their units of purchase.

- 6.2 ALLIED PRODUCTS
 - 6.2.1 Plywood, hard board, Block board, Sunmica their used and specifications .
 - 6.2.2 Commercial names of above-mentioned products and units of purchase.
- 2) Building Finishing Materials
 - 7.1.1 White washing materials required for white washing, their commercial names and units of purchase.
 - 7.1.2 Colour washing materials required for colour washing, their commercial names and units of purchase.
 - 7.1.3 Distemping, Types of distempers , their properties & uses /commercial names and units of purchase.
 - 7.1.4 Wall papering, papers used for wall papering, their commercial names and units of purchase.
- 7.5 Paints
 - 7.1.1 Characteristics of a good paint .
 - 7.1.2 Ingredients of oil paints .
 - 7.1.3 Preparations of oil paints .
 - 7.1.4 Different types of paints, their proper t ies &uses.
 - 7.1.5 Ready made paints, their commercial names and units of purchase.
- 7.2 Varnish
 - 7.2.1 Meaning
 - 7.2.2 Characteristics of a good varnish
 - 7.2.3 Ingredients of varnish, their uses, properties and commercial names .
- 7.3 Polish
 - 7.3.1 Meaning
 - 7.3.2 Types of polishes and uses .
 - 7.3.3 Commercial names and units of purchase.
- 7.8 Hard Wares.
 - 7.8.1 Screws
 - 7.8.2 Nails
 - 7.8.3 Nuts and Bolts.
 - 7.8.4 Hinges
 - 7.8.5 Door fittings - Tower bolt , Draw bolt , Haspenstible, Latches . Door knob.
 - 7.8.6 Door closers & stoppers
- 3) Miscellaneous Materials
 - 8.1 Plastics, Properties and their use in buildings.
 - 8.2 Sound insulating materials, characteristics of a good sound insulating material , different sound insulating materials, their commercial names and units of purchase.
 - 8.3 Fire proofing materials, characteristics of good fire proofing materials, different fine proofing materials, their commercial names and units of purchase.
 - 8.4 Damp proofing materials , characteristics of good damp roofing material , different damp proofing materials , their commercial names and units of purchase.
 - 8.5 Glass : types of Glass , market forms, specifications and units of purchase.
 - 8.6 Sandpaper & Emery paper , their uses, specifications and units of purchase.
 - 8.7 Names of cleaning materials for floor , walls, glass panes and their units of purchase.
 - 8.8 Non – ferrous metal s & alloys - such as Brass, Aluminium, Copper , their properties and uses.
 - 8.9 Adhesives: Types, commercial names , uses , and units of purchase.
 - 8.10 Linoleum - Market forms, proper ties and uses.

Building Materials

1. Market Survey: For trade/commercial names , specification, units of purchase and prevalent market rates for the following:

- 1.1 Stone (Blocks & slabs)
- 1.2 Bricks . Hollow blocks, etc .
- 1.3 Tiles - Flooring tiles and clay roofing tiles.
- 1.4 Terra Cotta-earthen ware, stone ware, S.W. pipes, water closets gully traps & glazed earthen tiles .
- 1.5 Cement - ordinary Portland, quick setting cement & other special cement .
- 1.6 Lime: Hydraulic lime, & limes.
- 1.7 Stones Aggregates : Coarse aggregate, medium aggregate and fine aggregate.
- 1.8 Brick ballast & surkhi .
- 1.9 Marketable forms of various types timber available in market .
 - 1.1.0 Various preservatives of timber available in market .
 - 1.1.1 Timber allied products such as plywood, hard board, block board, and sunmica.
- 1.10 Materials required for white Washing/colour wash such as lime, Zinc, white and Aluminum, etc.
- 1.11 Various types of distempers such as oil bound and Water bound.
- 1.12 Papers for wall papering.
- 1.13 Various types of paint available in the local market .
- 1.14 Various types of varnishes & polishes available in the Local market .
- 1.15 Hardware - such as screws, nails, bolts & nuts, hinges for door fitting, door closer and stoppers .
- 1.16 Plasters , and its products available in the local market .
- 1.17 Sound insulating material available in the local Market .
- 1.18 Fire proofing materials available in the local market .
- 1.19 Damp proofing materials available in the local market , use of damp proofing chemical .
- 1.20 Various types of glasses available in the local market .
- 1.21 Sand paper & emery papers of various grades and qualities .
- 1.22 Cleaning Materials for floors , walls, glass panes etc .
- 1.23 Ferrous materials in various market forms.
- 1.24 Non ferrous materials such as Brass, Aluminum, Copper , zinc , & lead.
- 1.25 Various types of adhesives
- 1.26 Market forms of Linoleum.

2. Brick

- 2.1 Stacking of bricks
- 2.2 Counting of bricks
- 2.3 Field testing of bricks such as for texture, dimensions water absorption, colour & efflorescence.

3. Cement and Lime

- 3.1 Testing of cement & lime in the field.
- 3.2 Testing of brick, testing of cement concrete cubes .

4. **Volumetric Measurement of Coarse & Fine Aggregates** - Sieve analysis fineness modulus of sand.

5. Type Of Joinery

Dove Tail Joint , Mortice and tenon Joint , Tongue and groove joint .

Longitudinal joints bearing joints framing joints, oblique & shoulder joints widening on side joints. knowledge & use of joinery.

Deep Foundation, Engineering classification of soil ,Bearing capacity.

General concept of piled, foundation.

6 Stone Masonry

6.1 Tools required for stone masonry.

6.2 Types of stone masonry.

6.3 Different types of joints in stone masonry.

7 Brick Masonry

7.2 Tools required for brick masonry.

7.3 Methods of laying Bricks in walls .

7.4 Precaution to be taken in construction of walls.

7.5 Methods of fixing new work with old work

(Toothing Racking back and Block Building)

7.6 Defects in Brick work , Maintenance of Brick Masonry construction.

8 Mortar and Concrete

8.1 Concept of water cement ratio, workability & curing.

8.2 Tools required for preparation of different types of mortar .

8.3 Methods of preparation of different types of mortar of different proportions.

8.4 Function affecting the strength of mortar .

8.5 Tools required for preparation of concrete.

8.6 Preparation of concrete of different proportion (This includes batching & mixing) .

8.7 Factors affecting strength of concrete.

9 Concept of frame structure

(i) R.C.C. frame including foundation

(i i) Structural steel frame Relative advantage.

10 Floors

10.1 Tools required for laying cement Concrete, Terrazzo, Mosaic, Marble and Stone slab.

10.2 Materials required for cement Concrete, Terrazzo, Mosaic, Marble and stone slab floors.

10.3 Method of construction of cement concrete floor of 1:2:4 mix.

10.4 Method of construction of Terrazzo & Mosaic floor , Methods of construction of Marble and stone slab floors .

10.5 Methods of construction of Brick floor .

10.6 Causes of defects in Brick, Cement concrete, Terrazzo & Mosaic marble and stone floors and their remedies .

10.7 Repair of old floors.

10.8 Methods of Cleaning, Cutting & polishing of Mosaic ,Terrazzo and marble floors - (Materials & tools required) .

11 Roofs

11.1 Tools required to fix A. C. sheet & G. I . Sheet & roof covering.

11.2 Methods for fixing of A. C. sheet and G. I . sheet roofs coverings .

11.3 Tools required to lay R.C.C.

(including knowledge for bending and binding and placement of bars)

11.4 Repair of cracks in R.C.C. structure (Methods, Tools & Materials required) .

12 Wall , Fencing & Gates

12.1 Construction & Maintenance of Compound wall , Fencing.

12.2 Fabricated steel gate.

13 Road work

13.1.1 Earth work for Road formation, Embankment & cutting,

13.1.2 Road construction and road surfacing.

13.1.3 Method of embankment construction, simple and culverts .

13.2 Surface Finishes

13.2.1 Plastering.

13.2.2 Tools required for Plastering.

13.2.3 Methods of cement & lime plastering.

13.2.4 Preparation of surface for plastering.

13.2.5 Application of plaster coats.

13.2.6 Curing of plaster .

13.2.7 Defects in plasterwork and their preparations.

13.2.8 Repairs of defective plaster .

14. Pointing.

14.1.1 Tools & Material required for painting.

14.1.2 Operation involved in painting of a masonry works.

14.1.3 Repair of old painting.

15. Painting of wood work

15.1.1 Tools required for painting.

15.1.2 Painting of a new wood work - preparation of surface Knotting, Priming, Stopping, Under Coat & finishing coat .

15.1.3 Repairing of old wood work - Methods of cleaning old surface repairing of old surface.

16. Painting of iron and steel work.

16.1 Methods of painting of new steel work .

17. Painting of other surfaces

17.1 Methods of painting of brick work and plastered surface.

17.2 Faults or defects in painting work and their remedial measures

18 Varnishing and polishing

18.1 Tools required for varnishing and polishing.

18.2 Process of varnishing and Polishing. Preparation of surface, knotting and priming. Application of varnish coats.

18.3 Methods of polishing metal .

19. Distempering.

19.1 Tools required for distempering.

19.2 Methods of application of distempers – Preparation of surface, priming coat & final coat .

20 Cement painting

20.1 Tools & materials for cement painting.

20.2 Process for application of cement paint on new and old surfaces.

21. Wall papering.

- 21.1 Tools and materials required for wall papering.
- 21.2 Process for placing wall paper in old and new walls.
- 22. Damp proofing :
 - 22.1 Sources of Dampness .
 - 22.2 Effect of Dampness.
 - 22.3 Precautions to be taken to prevent dampness .
 - 22.4 Methods of damp proofing basement ground floors, plinth and walls. Special damp proofing arrangements in bathrooms , W.C. and kitchen. Damp proof ing for flat and pitched roofs and window sills.
 - 22.5 Methods for laying damp proof Coats in existing buildings.

10) Timber Works

- 10.1 Repair and maintenance of decayed timber components in buildings & replacement of fittings.

11) Glazing Work

- 11.1 Tools required
- 11.2 Methods of cutting glass and fixing glass as described
- 11.3 Material required for cleaning old glass panes and method of cleaning.

12) Vitrified Tiles Work

- 12.1 Method of cleaning of China Clay glazed Tiles and materials required for cleaning, use of glazed tiles for flooring, wall dado etc .

13 Anti - termite Treatment in Buildings

- 13.1 Method of anti - termite treatment for walls.
- 13.2 Anti - termite treatment for soil .
- 13.3 Anti - termite treatment for wood work in Building.

14) Rolled Structural Steel Section

- 14.1 Rolled Structural steel section comprising of Beam, Channel & angles
- 14.2 Use of such materials for fabrication of Shed
- 14.3 Method of fabrication by riveting, bolting and welding
- 14.4 Maintenance of Steel Structures and prevention from corrosion.

Building Techniques

1. Carpentry

- 1.1 Carpentry tools, their use their care and maintenance.
- 1.2 Joints in wood work.
- 1.3 Uses of timber for various purposes.
- 1.4 Joinery, Materials used in joinery- screw, nails, nuts , bolts, glues,

2. Fittings

- 2.1 Tools used in filing, tapping, marking and measuring.

3. Masonry

- 3.1 Tools of a mason, their use, care and maintenance.

4. Shuttering

- 4.1 Object of shuttering
- 4.2 Types of shuttering
- 4.3 Materials used in shuttering.
- 4.4 Characteristics of a good shuttering
- 4.5 Constructional details of shuttering for beams , columns and slabs.

5. Scaffolding

- 5.1 Purpose of scaffolding.
- 5.2 Materials used for scaffolding.
- 5.3 Types of scaffolding.
- 5.4 Characteristics of a good scaffolding.
- 5.5 Various types of rope knots and metal coupling.
- 5.6 Erect ion of a scaffolding.

6. Plumbing

- 6.1 Dif ferent types of pipes & fittings for water supply, their specifications & use.
- 6.2 Different types of pipes & fittings for sewerage , their specifications & use.
- 6.3 Sanitary fittings & f ixtures such as water closets, wash basins, Urinal -posts, spotcock , kitchen suck, bid cock , pillar cock.
- 6.4 Materials for joints for water pipe & sewers.
- 6.5 Pipe and sewer joints . Procedure to be adopted while making joints in water pipes & sewer
- 6.6 Gradient followed in a sewer laying of sewer . Brief ideal of inspection chamber , manhole, intercepting ,chamber and ventilating pipes and their use.
- 6.7 Plumber tools , their use, care and maintenance.

7. Steel Structures

- 7.1 Rolled Structural Steel sect ion comprising - Beam, Channel and Angle
- 7.2 Use of such material for fabrication of shed
- 7.3 Method of fabrication by riveting, bolting and welding.
- 7.4 Maintenance of Steel Structures and prevention from corrosion.

Subject Name : Construction Material and Services – 2nd Year

1. Meaning & use of arches & lintels, glossary & terms used in arches, types
2. Meaning & use of various types of doors & windows, glossary & terms used in doors & Windows along with working knowledge of Vastu Shastra & Fengshui in modern times for correction of the various problems in daily life.
3. Floor finish topping under layer , base course, rubble filling & their purpose , Types of floor finish.
4. Knowledge of relation between rise & tread width of the stairs ,landing characteristics of good stairs. Types of stairs details & calculations .
5. Characteristics of a good paint . Ingredients of oil paints, types .Preparation of oil paints. Different types of paints, their properties and uses Ready made paints, their commercial names and units of purchase.
6. Meaning characteristics of a good varnish Ingredients of varnish, their uses , properties and commercial names .Polish Meaning types of polishes and uses . Commercial names and units of purchase. Working drawing basics – Building codes and standards for reference, Select ion of appropriate scale for drawings, Procedure of preparing working drawings , Plans – Standard symbols for wiring and electrical fittings, plumbing symbols, Heating / Ai r - conditioning and ventilating symbols, Roof plans and plot plans, Elevations –Exterior elevations, Interior elevations, Sect ions -Residential building upto five floors.
 - (i) Commercial building/Residential Multistoried building with lifts
 - (ii) Institution building/show rooms , spas ,clubs, gyms ,Exclusive retail outlets with escalators / lifts fountains/game park s/ restaurants music stores departmental stores etc. ,
 - (iii) Community cent re / Library building/Entertainment centres
 - (iv) Landscaping
 - (v) Colouring of the drawing on the print . Conforming to Building bye law
 - (vi) Structural detailing (R.C. + steel) sessional sheets

Detailed working knowledge of : -

1. Plumbing:

Knowledge of different types of pipe & pipe fittings such as water closets wash bas insurinal posts stop cock bib cock pillar cock their use care & maintenance

2. Carpentry

Carpentry tools , their use their care and maintenance Joints in wood work. Uses of timber for various purposes .Joinery, Materials used in joinery- screw, nails, nuts, bolts, glues ,

3. Masonry

Tools of a mason, their use, care and maintenance.

4. Shuttering

Object of shuttering, Types of shuttering ,Materials used in shuttering .Characteristics of a good shuttering ,Constructional details of shuttering for beams , columns and slabs .

5. Scaffolding

Purpose of scaffolding. Materials used for scaffolding. Types of scaffolding. Characteristics of a good scaffolding. Various types of rope knots and metal coupling. Erection of a scaffolding

6. Wall , Fencing & Gates

Construction & Maintenance of Compound wall , Fencing. Fabricated steel gate.

7. Road Work

Earth work for Road formation, Embankment & cutting, Road construction and road surfacing. Method of embankment construction, simple and culverts

8. Surface Finishes

Plastering. Tools required for Plastering. Methods of cement & lime plastering. Preparation of surface for plastering .Application of plaster coats . Curing of plaster . Defects in plasterwork and their preparations. Repairs of defective plaster .

9. Pointing.

Tools & Material required for painting. Operation involved in painting of a masonry works. Repair of old painting.

10. Painting of Wood Work

Tools required for painting. Painting of a new wood. Woodwork - preparation of surface. Knotting, Priming, Stopping, Under Coat & finishing coat . Repairing of old wood work - Methods of cleaning old surface repairing of old surface.

11. Painting of iron and steel work.

Methods of painting of new steel work .

12. Painting of other surfaces

Methods of painting of brick work & plastered. Surface Faults or defects in painting work and their remedial measures

13. Varnishing and polishing

Tools required for varnishing and polishing. Process of varnishing and Polishing. Preparation of surface, knotting and priming. Application of varnish coats Methods of polishing metal .

14. Distemping.

Tools required for distemping. Methods of application of distempers - reparation of surface, priming coat & final coat .

15. Cement painting

Tools & materials for cement painting. Process for application of cement paint on new and old surfaces.

16. Wall papering.

Tools and materials required for wall papering. Process for placing wall paper in old and new walls.

17. Damp proofing :

Sources of Dampness . Effect of Dampness. Precautions to be taken to prevent dampness. Methods of damp proofing basement ground floors, plinth and walls . Special damp proofing arrangements in bathrooms , W.C. and kitchen. Damp proofing for flat and pitched roofs and window sills . Methods for laying damp proof Coats in existing buildings.

18. Timber Works

Repair and maintenance of decayed timber components in buildings & replacement of fittings.

19. Glazing Work

Tools required : - Methods of cutting glass and fixing glass as described. Material required for cleaning old glass panes and method of cleaning.

20. Vitrified Tiles Work

Method of cleaning of China Clay glazed Tiles and materials required for cleaning, use of glazed tiles for flooring, wall dado etc .

21. Anti - termite Treatment in Buildings

Method of anti - termite treatment for walls .Anti - termite treatment for soil . Ant i - termite treatment for wood work in Building.

22.Rolled Structural Steel Sect ion

Rolled Structural steel sect ion comprising of Beam & Channel & angles. Use of such mater ials for fabrication of Shed. Method of fabrication by riveting, bolting and Welding.

Maintenance of Steel Structures and prevent ion f rom cor rosion.

23. Knowledge of drawings:

Methods of construction of ellipse, including it elementary properties, parabola and rectangular hyperbola cycloidal (sp.) and involute curve.

Construction Services

Practical

1. To calculate quantities of materials for :
 - a. Plain concrete of different proportion.
 - b. Bricks and stone masonry in cement and lime mortar .
 - c. Plastering and pointing with cement mortar in different proportions .
 - d. While washing and colour washing.
2. To do rate analysis of the following items of work. Earth work in excavation. Cement concrete in foundation. R.C.C. and R.B.C. in roof slabs. Brick masonry in cement mortar . Coarse rubble measuring stone in concrete mortar . Coarse procedure. Cement Plaster. White washing on a new surface. Painting new wood work .Cement concrete floor . Panelled and glazed door .
3. To prepare a detailed estimate of a small resident ial building with flat roof .
4. Building bye law paper matter can be increase depending on revision of municipal rules
5. Working drawing basics – Building codes and standards for reference, Select ion of appropriate scale for drawings, Procedure of preparing working drawings , Plans – Standard symbols for wiring and electrical fittings, plumbing symbols, Heating / Ai r - conditioning and ventilating symbols, Roof plans and plot plans , Elevations –Exterior elevations,
6. Interior elevations, Sections -Residential building upto five floors.
 - I) Commercial Building/
 - II)Residential Buildings /different rooms /work homes one room apartments with full ut i lization of space &budget
 - III) Institution building/Schools /
 - IV) Community centre / Library building
 - V) Landscaping
 - VI) Colouring of the drawing on the print . Conforming to Building bye law using AUTOCAD(optional)

List of Equipments:-**Requirements:-**

1. Drafting tables
2. Computers
3. Reference books
4. Working labs-Home science Laboratories
5. Carpenter tools
6. Masons Tools
7. Paint Brushes & cans
8. Masonry devices
9. Tin Smith's working instruments
10. Scaffolding materials/temporary staging materials
11. Electrical Drills – with various measures
- 12 Safety equipments
13. Sand Paper, Adhesives non-ferrous metals Brass Aluminum Copper
- 14 T Square & set Squares, Pens Rotering
- 15 Model display Table
- 16 Cupboards
- 17 White Board- Markers & dusters
- 18 Display Boards
- 19 Glass Cupboards for display of materials
- 20 Show cases for display of models/awards etc.
- 21 Wall Open space – Functional Use
- 22 Racks to store materials

References

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8. Alexander M Z –handbook of Decorative Design& Ornament – Tudor Publishing Co., New York
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