

Program outcome for undergraduate science

The mission of higher education is shaping the attitude of students in a manner that they can

capable of finding solutions to current challenges for social development and conducting

research in various fields for innovations. It helps them to realize their social goals, hence

making them a useful member of society.

1. Cognitive thinking – Students would develop an ability to connect with the conscious

mental process and able to differentiate between assumption and reality.

2. Knowledge and Understanding – Able to understand and analyze the knowledge of

science in various field.

3. Design solutions – Design Experimental methods based on the problem and ability to

analyze and draw conclusions on that basis.

4. Effective communication – Ability to communicate with people clearly at least in any

one Indian language, and share their ideas in person or through electronic media.

5. Social interaction – Ability to put their view on burning social issues, mediate the

disagreement and help reach conclusions on such issues.

6. Ethics – Recognise the value system of the different community including their own.

Understand the changing value system of society with time.

7. Environment and sustainability – Show awareness towards environmental issues, able

to communicate with the society regarding those issues and sustainable development.

8. Life long learning – Inculcate aspiration towards learning new things and new technology in this ever-changing world.

B.Sc. BOTANY PROGRAMME SPECIFIC OUTCOME (PSOs)

PSOs 1 – Understand plants at both organizational and functional level

PSOs 2 – Understand Taxonomy, developmental biology and Ecology

PSOs 3 – Analyze the impact of deforestation on environmental degradation

PSOs4 – Understand the application of plant science in agriculture, horticulture, soil

conservation, and medicine and pollution control

PSOs 5 – Understand the importance of sustainable development and energy conservation

PSOs6 – Able to perform experiments as per laboratory standard in the area of the

prescribed curriculum

B.Sc. BOTANY COURSE OUTCOME (COs)

THREE YEAR DEGREE COURSE

PART-1

COs 1 – a study on the importance of cell, cell organelles, and cell division

COs 2 – General account of Characters, Evolutionary trends, Economic importance and

Classification of following Algae Nostoc, Volvox, Oedogonium, Coleochaete, Chara, Ectocarpus, Fucus, and Polysiphonia.

COs 3 – Brief account of the structure and economic importance of LICHENS

COs 4 – Brief account of general characters, evolutionary trends, economic importance

and classification of Pteridophyta Psilotum, Lycopodium, Selaginella, Equisetum, Osmunda and Azolla

COs 5 – Discuss the classification and brief life cycle of following Bryophyta – Marchantia, Anthoceros, Sphagnum and Polytrichum

COs 6–Discuss the History of Microbiology, Bacterial cell structure, and culture

COs 7 – Discuss the nature and structure of TMV and BACTERIOPHASE

COs 8–Brief knowledge of the study of the role of microbes in nitrogen fixation and

degradation of agriculture produces

COs 9 –General account of enzymes and microbial Toxins and its role in plant pathogenesis

COs 10 – Study on pathogen, etiology, mode of action and control of important fungal

disease of Bihar Synchytrium, Albugo, Neurospora, Puccinia and Alternaria

COs 11 – General account of classification, heterothallism, and degeneration of Sexuality

in Fungi

PART – 2

COs 1 – A comparative study of the Morphological, Anatomical, Embryological features,

affinities and Economic importance of some important Gymnosperm

COs 2 – A brief account of Paleobotany with emphasis on Lyginopteris and Cycadeoidea

COs 3 –Discuss the principles of plant taxonomy with reference to Linnaeus, Bentham

and Hooker, Engler and Prantl and Hutchinson system of classification

COs 4– Importance of International Code of Botanical Nomenclature and its application

in plant taxonomy with reference to Embryology, Cytology, and Phytochemistry

COs 5 – Explain in brief and account, diagnostic features of following families

Ranunculaceae, Annonaceae, Nyctaginaceae, Apocynaceae, Polygonaceae,

Caryophyllaceae, Euphorbiaceae, Cucurbitaceae, Verbenaceae including some

monocotyledonous families.

COs 6–A detailed knowledge of Mendelism and its modification

COs 7 – Study on organization and classification of plant tissue with a brief account of

anomalous secondary growth and in relation to the environment

COs 8 –Brief account of the developmental process in Angiosperm – Microsporogenesis,

Male Gametophyte, Megasporogenesis, Female Gametophyte, Fertilization, Apomixis, and Endosperm formation

COs 9 –Study the Important plants of Bihar, medicinal, oilseeds, Pulses, Cereals, Fruits,

Vegetables and Timbers

COs 10 – Discuss the principles of Plant Tissue Culture and its significance

Part – 3

COs 1 – A comparative study of Osmoregulation, Osmotic quantities, and their relationship

COs 2 – Study the water relationship in plant physiology like Absorption of water, Ascent of sap, Transpiration, Mineral nutrition and Transport of solutes.

COs 3 – Introduction to the vital function of plants photosynthesis, respiration, aminoacid and protein synthesis, fat metabolisms

COs 4 – A brief account of classification and mode of action of enzymes

COs 5 – General account of the application of plant growth hormones with plant movement, photoperiods, vernalization, and plant defense mechanism

COs 6 – Introduction to microscopy and cell structure

CO 7- Study the ultrastructure of the chromosome, cytoplasmic inheritance, linkage and

crossing over

COs 8– Discuss different aspects of mutation, structural and numerical change in chromosome

COs 9 – Explain the chemical nature and replication of genetic material, genetic code, genetic engineering, and biotechnology

COs 10 – Define one cistron one polypeptide hypothesis and modern concept of gene

COs 11 – Historical account methods and objectives of plant breeding and its application

in wheat improvement, heterosis, conservation and maintenance of germplasms

and quarantine methods

COs 12 – Scope of ecological factors, Edaphic factor, soil erosion conservation and

reclamation, biotic factor, ecological succession, ecological adaptation, and environment

COs 13 – Brief account of ecosystem management, conservation of plant diversity and

phytogeography

COS 14 – Explain social forestry, renewable energy, bio-gas and pollution

Programme Outcome of Postgraduate Science/Arts

1. Understand the role of interdisciplinary sciences in the wellbeing of society

2. Understand the importance of the co-existence of cultural diversity and develop

value-based leadership traits

3. Understand the value of natural resources and its optimal utilization for sustainable

development

4. Unleash innovatively the ideas and strategic skills to device problem-solving strategy
5. To imbibe inquisitiveness towards critical thinking and everlasting quench of knowledge

PROGRAM SPECIFIC OUTCOME OF MSc BOTANY

Pos1- Understand the concept of plant development and reproduction and plant resource

utilization

Pos2- Evaluate and understand the principles of ecology

Pos3- Understand the techniques used in biotechnology, genetic engineering, and immune

technology

Pos4- understand the basic concept of cytology, biodiversity of bacteria, viruses, fungi, algae,

bryophytes, pteridophytes, and gymnosperms

Pos5- Understand the taxonomy and physiology of angiosperms

Pos6- understand the concept of molecular biology

DEPARTMENT OF BOTANY

SEMESTER WISE COURSE OUTCOME FOR ODD AND EVEN SEMESTER OF

POSTGRADUATE PROGRAM

Semester – 1

Paper – 1

Cytology

COs1- Understanding the structure and function of cell and cell organelles

COs2- Understanding fundamental principles of Microscopy, SEM, TEM, and Electron

microscope

COs3- Brief idea of radioisotopes, tracer techniques, and radiography

COs4- Study of cell chemistry

COs5- Explain cell apoptosis

Genetics

COs1- Understanding Mendelian principles and its deviation

COs2- Study of sex determination, sex-linked and influenced phenotype

COs3- Discuss variation in chromosome structure, chromosome number and variation at

molecular level

COs4- Study of population genetics, Quantitative genetics, probability and Chi-square

test, linkage maps, and Interference

Paper-II

Biology and Diversity of Viruses, Bacteria and Fungi

COs1- Explain structure, nature, replication and transmission of bacteriophage and RNA

virus

COs2- Study of cell structure, reproduction and economic importance of Archaeobacteria

and Eubacteria. N₂ fixation

COs3- Explain silent features of cyanobacteria and their role in N₂ fixation

Cos4 –Understand the classification, structure, reproduction, and evolution with reference

to Mestigomycotina, Zygomycotina, Ascomycotina, Basideomycotina &

Deuteromycotina

COs5- Study the importance of mycorrhizae, fungal and viral disease of Bihar

Paper - III

Biology and Diversity of Algae, Bryophytes, and pterophytes

COs1- Study the classification and general accounts and economic importance of

Chlorophyceae, Charophyceae, Xanthophyceae, Bacillariophyceae,

Phaeophyceae, and Rhodophyceae

COs2- Explain classification, economic importance, the evolution of sporophytes,

structure and reproduction in Sphaerocarpaceae, Marchantiales, Sphagnales,

Polytrichales

COs3- Understand the physiology spore germination, protonema differentiation and

water conduction in Bryophytes

COs4- Study the classification and general features of Psilotales Isoetales,

Ophioglossales and Salviniaceae

COs5- Understand stem and fructification of Lepidodendrales, Sphenophyllales and

Calamitales

SEMESTER: II

Paper – V

Molecular Biology

COs1- Study the structure and replication of genetic material, DNA damage, and repair,

molecular basis of recombination

COs2- Describe the ultrastructure of gene and Chromosome organization

COs3- Understand transcription, translation and gene regulation in prokaryotes and

eukaryotes

COs4- Explain the properties of the genetic code

COs5- Define transposable elements and mechanism of transposition

Paper – VI

Biology and Diversity of Gymnosperms and Taxonomy of Angiosperms

COs1- Discuss the classification, structure, and reproduction in Cycadales, Gnetales,

and Gnetales, general account of Cordaitales

COs2- Brief account of families Lyginopteridaceae, Pentoxylaceae, Caytoniaceae,

COs3- Discuss various system of angiosperm classification and their merits and demerits

Cos4- Define the role of cytology and anatomy in taxonomy, the importance of cytotaxonomy and numerical taxonomy

COs5- Explain the features of ICBN, rule of priority, valid publication, author citation,

retention and rejection of names, the importance of Botanical gardens and herbaria

COs6- Explain floral variation and phylogeny of following orders; Magnoliales, Caryophyllales, Fabales, Alismatales, Cyperales

Paper – VII

Plant Physiology and Metabolism

Cos1- Understand the importance of following functions energy flow, Water relation,

photosynthesis, enzymes and respiration, and nitrogen metabolism

COs2- explain the physiological effects of growth hormones and physiology of flowering

COS3- Discuss the structure and classification of carbohydrates, proteins, and lipids

COs4- Understand signal transduction

SEMESTER – III

Paper – IX

Plant Development and Reproduction

COs1- Understand the role structure and functional aspects of meristem, and cambium

COs2- Discuss the features of abnormal secondary growth, stomata, trichomes, and role

of anatomy in systematic

COs3- Understand anatomical adaptation to different habitat

COs4- Discuss the transition phase of plants from vegetative to reproductive and gender

expression in Monoecious and dioecious plants

COs5- Discuss developmental embryology and double fertilization

Paper – X

Principles of ecology

COs1- understands Ecology and its types, environmental concepts-laws and limiting

factors, ecological models

COs2- Study of characteristics of the population, population size and exponential growth,

limits of population growth, population dynamics, fertility rate, and the age structure

COs3-Discuss competition and coexistence, intra and interspecific interactions

COs4- Study of nature of the ecosystem, production and energy flow through an ecosystem and biogeochemical cycles

COs5- Discuss biosphere and the impact of climate on biomass

COs6- Discuss the major ecosystem of the world, natural resource, and their management

COs7- Understand environment stress and their management, global climatic pattern and

variations over time, climatic change, greenhouse gas, ozone layer depletion, and global warming

COs8- Define pollution, biodegradation, and bioremediation

Cos9- Study the policies and regulations of environmental issues, biodiversity act of

India IUCN categories of threat and hot spot

COs10- Discuss biodiversity assessment, conservation and management, and natural

resource management in changing the environment

Paper – XI

Plant Resource Utilization

COs1- Discuss the origin, evolution, cultivation, and use of food, forage and fodder

crops, fiber crops, medicinal plants, vegetable and oil yielding plants, firewood timber and nonwood forest products

COs2- Study of general accounts of the activities of, BSI, NBPGR, ICAR, CSIR, and DBT

SEMESTER – IV

Paper – XIII

Plant tissue culture & Biostatistics and Immunotechnology

Cos1- Study the techniques of micro-propagation of important floriculture, agriculture,

and medicinal plants

COs2- Learn the techniques of in vitro germplasm conservation

COs3- Study the causes and application of somaclonal variations

COS4- Learn culture media preparation and role of different ingredient used in it

COs5- Understand the importance of tissue culture in the production of secondary

metabolites

COs6- Understand mean, mode, median and probability

COs7- Understand types of error, P value-ANOVA

COs8- Study the fundamentals of Immunology, ELISA< ISH< FISH

Paper – XIV

Biotechnology and Genetic Engineering

COs1- Learn the technique of isolation of DNA from plants and bacteria, southern

blotting, polymerase chain reaction, strain improvement and production of antibiotics, gene transfer in bacteria & higher plants, selection of transformed cell

COs2- Study DNA sequencing, different types of C-DNA library

COs3- Study of restriction endonuclease, their nomenclature,details of restriction

endonuclease II with recognition sites of important restriction endonucleases

COs4- Discuss the importance of plasmid and phage vectors, their application in formation of recombinant DNA, enzymes used in recombinant DNA construction, DNA fingerprinting

COs5- Study strain improvement and production of antibiotics

COs5- Understand the basic concept of bioinformatics, functional genomics, protein profiling

COs6- Study different types of tissue culture, somatic hybridization

COs7- Explain the technique involved in mushroom cultivation and mycorrhizal biotechnology

Paper –XV

Elective paper

COs1- Understand, study in details the topics selected by your choice

a. Environmental biology,

- b. Taxonomy and Ethnobotany
- c. Cytogenetics and crop improvement
- d. Biotechnology
- e. Advanced pathology
- f. Plant pathology deterrent

B.Sc. Zoology Programme Specific outcome (PSOs)

PSOs1- Understand the basic concept of different branches of biology such as cell

biology, Molecular biology, Biotechnology, Microbiology, etc.

PSOs2- Understand the basic similarities and difference in structure, organization, and

function between different phyla of the animal kingdom.

PSOs3- Analyze the interaction and relationship between biotic and abiotic factors of the

environment

PSOs4- Understand the application of biological science in economics and employment

such as Apiculture, Aquaculture, Agriculture, Sericulture, Lac culture, etc

PSOs5- Perform experiments as per laboratory standards in the area of different topics

prescribed in the syllabus

B.SC Zoology Course Outcome

PART – 1

COs1- NON-CORDATA: Study the general character and classification up to order

COs2- Detailed study of Phylum Protozoa Paramecium, Leishmania donovani, Entamoeba histolytica, and Polystomella

COs3- Describe the life cycle of second and canal system in sponges

COs4- Study in detail life history of Obelia, Aurelia and sea Anemone, Fasciola hepatica, Taenia solium, Planaria, Ascaris lumbricoides, Wuchereria Bancroft, Pheretima Posthuma Posthuma, Leech and Nargis

COs5- Discuss the Affinities and life cycle of Hermifora in detail

COs6- Describe Arthropods with special reference to Palaemon, Peripatus and affinities

and parasitic adaptation of this group by using the example

COs7- Explain the life cycle of Begula and its affinity

COs8- Study the life history of Unio and Pila and torsion and detorsion in Gastropoda

COs9- Identify the character and life history of Asterias and Balanoglossus

COs 10- ECOLOGY: Study the concept of Biosphere and Ecosystem and ecological succession

COs11- Discuss the structure and function of freshwater, desert and forest ecosystems

COS12- Define pollution, its sources, and hazards

COs13- Explain the importance of wildlife conservation

COs14- ANIMAL – BEHAVIOUR: Discuss innate and learned behaviors of animals and the concept of the biological clock

COs15- BIOMETRY: Scope and application of following statistical methods range,

mode, median, arithmetic mean, standard error, standard deviation, sample ttest, and chi-square test

TDC PART II

COs1- CORDATES: Study the origin and evolution of chordates

COs2- Describe the characters, bionomics, and classification of major phyla up to order

COs3- Give a consolidated account of one genus from following Urochordata, Cephalochordata, and Cyclostomata

COs4- Discuss the Life history of any bony fish (Scoliodon and Labeo)

COs5- Explain distribution, organization, and affinities of Dipnoi

COs6- Write down the life history of Neoteny

COs7- Describe the life history of Garden Lizard and biting mechanism in snakes

COs8- Discuss origin of birds and their flight adaptation with special reference to

Columba

COs9- Discuss characters distribution and affinities of Prototheria and Metatheria

COs10- Study general organization of primates

COs11- COMPARATIVE ANATOMY: Study of the following organ system of major vertebrates Integument, Gastrointestinal tract, Respiratory system, Heart and Aortic arches, Kidney, urinogenital ducts and gonads

COs12- EMBRYOLOGY: Describe fertilization and types of eggs

COs13- discuss the development of Amphioxus up to the formation of Coelom

COs14- Study the structure, development and the function of following organ in the

chick embryo: germinal layer, extraembryonic membrane, heart, brain, and eye

COs15- Explain the development, types, and function of placenta in mammals

PAPER III

COs1- BIOCHEMISTRY: Study the structure and classification of protein, carbohydrates, fats, and amino acids

COs2- Explain the mechanism of Glycolysis, Krebs's cycle and Beta oxidation of fatty acids

COs3- Define vitamins their types and functions

COs4- PHYSIOLOGY: Explain the physiology of digestion, respiration, excretion, osmoregulation, blood coagulation, and testicular and ovarian cycles

COs5- ENDOCRINOLOGY: Study histology, chemical nature and physiological action

of the hormones of Pituitary gland, Thyroid gland, Adrenal, Islets of Langerhans and Gonads

COs6- Cell-Biology: Study in detail the structure and functions of cell and cell organelles

Cos7- Explain gametogenesis and parthenogenesis

COs8- GENETICS: Study linkage and crossing-over and extranuclear genetic system

COs9- Explain chemical nature and replication of genetic material and their role in transcription and translation

COs10- A brief account of mutation both at the molecular level and chromosomal level

COs11- ECONOMIC ZOOLOGY: General accounts of Lac culture, Sericulture, Apiculture and Pisciculture

COs12- Give an elementary idea of the common pests of paddy, wheat, sugar cane, and their control

COs 13- Study biology, mode of infection and prevention and control of the vector of

Salazar, Malaria, and Filaria

COs-14- EVOLUTION: Explain the principles of evolution: Lamarckism, Neo Lamarckism, Darwinism, and Neo Darwinism

COs15- Define Hardy-Weinberg Law and Genetic equilibrium

COs16- Give a consolidated idea of fossil history of man and horse

COs17- Explain the theories and principles pertaining to animal distribution

COs18- Study the Zoogeographical realms of the world

COs19- Explain the characteristics of Island fauna and peculiar fauna of Oriental, Ethiopian and Australian regions

Cos20- Discuss the faunistic peculiarities of Paleozoic, Mesozoic and Cenozoic eras

COs21- Define fossil their mode of formation and age determination

COs 22- Explain the histology of integument, stomach, intestine, liver, spleen, kidney

and various tissues

DEPARTMENT OF CHEMISTRY

COURSE OUTCOME

First Year CO:

Paper No. 1.

Name of the Paper: Physical Chemistry and Inorganic Chemistry

Group A (Physical Chemistry)

CO 1: Derivation of Vander waals equation of state, critical phenomenon, critical constants and

their evaluation in terms of vander waals constants.

CO 2: Determine of vander waals constants, law of corresponding states, reduced equation of

states, Boyle's temperature.

CO 3: Free volume of a liquid, vapour pressure, Troutons rule, Surface tension, viscosity and

their measurements.

CO 4: Molar volume, Parachore, Rheocore and chemical constitution, Kopp's law, internal

pressure, solubility parameters, liquid crystal.

CO 5: Phase rule and the definition of terms, involved in it, one component system. Water and

Sulphur system, two component system Ag-Pb, KI +water, eutectic point.

CO 6: Formation of compounds with congruent melting points. Deliquescence, efflorescence,

triple point.

CO7: Conduction in electrolytic solutions, Equivalent, specific and Molar conductances, cell

constant, effect of dilution on conductance, ionic mobility and migration of ions.

CO 8: Kohlrausch's law, transport number and its determination by Hittorff's method,

Application of conductance measurements.

Group-B (Inorganic Chemistry)

CO 1: Atomic and ionic radii, ionization potential, electron affinity and electron negativity, their

trends in periodic table and application in explaining and predicting the chemical behaviours.

CO 2: V.B. theory and its limitations, Directional characteristics of covalent bond, Hybridisation

and shape of inorganic molecules and ions.

CO 3: VSEPR theory with special reference to bond and electronegativity, M.O. theory.

Homonuclear and Heteronuclear diatomic molecules [CO, NO], bond strength, bond energy.

CO 4: Dipole moment, Percentage ionic character in HX, Molecular geometry of polyatomic

molecules. Ionic Solids, Lattice energy, Born Haber cycle, salvation energy, solubility of ionic

solids, polarizing power and polarizability of ions, Fajan's rule. Weak interactions: H-bonding

and vander waals forces.

CO 5: s-Block Elements: Comparative study, diagonal relationship, hydrides, salvation and

complexing tendencies, an introduction to alkyl and aryl organometallics.

CO 6: Comparative study, Relationship among metal, non-metal and metalloids elements of

group 13-17. Elementary idea of hydrides oxides and halides. Hydrides of boron. Diborane and

Higher boranes. Borazine, boro hydrides, fullerenes.

Paper No. II

Name of the Paper: Physical Chemistry and Organic Chemistry

Group-A (Physical Chemistry)

CO 1: Atomic structure: Black body radiation and Planck's quantum theory, Wave-particle,

duality for electron and de-Broglie equation, experimental verification of de-Broglie equation by

Davission and German experiment, de-Broglie wave associated with Bohr orbit in H-atom,

Heisenberg uncertainty principle and its importance.

CO 2: Solid State: Types of solids, space lattice and unit cell. Law of rational indices-Miller and

Weiss indices. Interplaner spacing in cubic system, radius ratio and coordination number,

packing of particles-octahedral and tetrahedral voids.

CO 3: Thermodynamics: Objective of thermodynamics, thermodynamic terms, first law and its

mathematical formulation, Internal energy, enthalpy, Cp and Cv relation, Joule-Thomson effect.

Joule Thomson coefficient for ideal and real gases, Inversion temperature, work done in

irreversible expansion, Reversible and irreversible adiabatic expansion of an ideal gas.

CO 4: Thermo-chemistry: Exergonic and endergonic compounds, enthalpy of reaction at

constant volume and constant pressure, enthalpy of combustion, Bomb calorimeter, enthalpy of

neutralization and ionization, Kirchoff's law, Hess's law, bond dissociation energy.

Group-B (Organic Chemistry)

CO 1: Estimation of nitrogen and sulphur in an organic compound. Determination of molecular

mass of a carboxylic acid by silver salt method and of an organic base by chloroplatinate salt

method.

CO 2: Hybridisation and geometry of hydrocarbons bond lengths, bond angles, bond

dissociation energy, localized and delocalized chemical bond, Vander Waal interactions and

Hydrogenbonding resonance, hyperconjugation, inductive & electromeric effect, their effects on

properties of compounds.

CO 3: Homolytic and heterolytic of covalent bonds. Types of reagents: electrophilic &

nucleophilic. Types of organic reactions, energy consideration with reference to activation

energy and transition state. Reactive intermediates: carbanions, carbocations and free radicals.

CO 4: Classification and nomenclature. Monohydric alcohols: Method of preparation, Physical

and chemical properties. Distinction among 1^o, 2^o and 3^o alcohols. Preparation and properties of

(i) Ethylene glycol (ii) Glycerol and (iii) Allyl Alcohol.

CO 5: Organomagnesium compounds, The Grignard reagent-formation structure and application

in organic synthesis. Basic idea about organometallics: Dimethylzinc, Dimethylcadmium,

Alkyl lithium and Lithium dialkylcuprate.

CO 6: Preliminary idea of organic sulphomides, sulphonics and sulphonic acids, method of

formation and chemical reactions of thiols and thioethers.

CO 7: Nomenclature, Structure of the carbonyl group. General methods of preparation,

properties of aldehydes and ketones. An introduction to α,β unsaturated aldehydes and ketones.

CO 8: General methods of preparations and properties of monocarboxylic acids and their

derivatives such as ester, acid chlorides, amides and anhydrides. Methods of formation and

chemical reactions of (i) unsaturated monocarboxylic acids and (ii) dicarboxylic acids.

CO 9: Classification, nomenclature and structure of amines. Preparation and properties of

aliphatic amines. Separation & identification of 1, 2 and 3 amines. Preparation, properties and

estimation of urea.

Second Year

Paper No. III

Name of the Paper: Physical Chemistry and Inorganic Chemistry.

Group-A (Physical Chemistry)

CO 1: Rate law for a general reaction, Mathematical derivation of 1st, 2nd and 3rd order reaction

and their life period. Methods of determining order of reactions, Arrhenius equation, Energy of

activation, Potential energy diagram and concept of activated complex, rate data and mechanism

of reactions. Homogeneous and Heterogeneous catalysis. Effect of catalyst on reaction rate,

specificity of catalysed reaction.

CO 2: Maxwell distribution law of velocities and energies of gaseous molecules. Effect of mass

and temperature on molecular velocities. Treatment of velocities, Collision number, Collision

frequency, mean free path, viscosity of gases.

CO 3: Ostwald's dilution law and its verification, PH of buffer solutions. Hydrolysis of salts.

Relation between K_h , K_w , K_a and K_b , pH of hydrolysed salt solutions, degree of hydrolysis,

choice of acid-base indicator with pH change, solubility product, Ionic product and common ion

effect.

CO 4: Electrochemical cells, reversible and irreversible cells, reversible electrodes, Concept of

electrode potential, standard electrode potential, Nernst equation for electrode potential, Calomel

electrode, Quinhydrone electrode, Application of emf measurement, determination of pH, ionic

product of water, solubility & solubility product of sparingly soluble salt.

Group-B (Inorganic Chemistry)

CO 1: Types of bond: σ , π , δ and τ bonds. Bonding in B_2H_6 Copper acetate and chromous

acetate, concept of resonance and delocalisation of orbitals e.g. NO_2 , NO_3 , SO_2 , SO_3^{2-} , SO_4^{2-} , PO_4^{3-} and CO_3^{2-}

2- ions. Hydrogen bond and related properties.

CO 2: d-block elements and their characteristics properties, study of elements of first transition

series and their binary compounds, complex formation in different oxidation states and their

stabilities, Principle behind volumetric estimation of Cu^{2+} , Fe^{2+} and Cr^{3+} ions by the use of

standard sodium thiosulphate, potassium permagnate and potassium dichromate solution.

CO 3: General Characteristic of heavy elements, comparative study with their 3d analogues in

respect of their ionic radii, stability of oxidation states, magnetic behaviour of compounds

complex forming tendencies and stereochemistry.

CO 4: Physical properties of solvents, types of solvents and their general characteristics, reaction

in non-aqueous solvents such as liquid ammonia and liquid sulphur dioxide.

CO 5: Werner's coordination theory and its justification from physical data, Isomerisation in

complexes, Sidwick of effective atomic number, Chelates, Nomenclature of coordination

compounds, valence bond theory of metal-ligand bonding with respect to coordination number 4

and 6, Inner and outer orbital complexes, Inner complexes metal ions with organic reagents such

as hydroxyquinoline, dimethyl glyoxime.

Paper No. IV

Name of Paper: Physical Chemistry and Organic Chemistry

Group A (Physical Chemistry)

CO 1: Thermodynamics: Spontaneous and non spontaneous process, necessity of second law of

thermodynamics, Carnot cycle and its efficiency, Clausius inequality, entropy, entropy change of

an ideal gas, entropy of mixing, Helmholtz energy and Gibbs's energy, their variation with

pressure and temperature, Gibbs Helmholtz equation, Clausius-Clapeyron equation and its

application in colligative properties.

CO 2: Solution: types of solution, solution of gases in liquids, Henry's law, solution of liquids in

liquids, Raoult's law, vapour pressure of ideal solution, free energy, volume and enthalpy, change

for ideal solution, entropy of mixing for an ideal and non ideal solution, Duhem Margules

equation, variation of total vapour pressure with variation of composition of the liquid phase,

azeotropic mixture, principle of steam distillation and fractional distillation.

CO 3: Surface chemistry:- types of adsorption, Langmuir's adsorption isotherm and adsorption

and catalysis, effect of temperature and pressure on surface reaction with reference to

heterogeneous catalysis, classification, preparation and purification of colloidal sols, their optical

and electrical properties, Hardy-Schulze law, gel, synthesis, thixotropy, association of colloidal

electrolytes, soaps micelles, emulsions.

CO 4: Distribution law; Nernst distribution law, its thermodynamics derivation and limitation

factors affecting partition coefficient, essential conditions for validity of distribution law,

modification of distribution law for association, dissociation and solvent participation.

Application; complex formation between KI and I₂, CuSO₄ and NH₃, solvent extraction process.

Group –B (Organic Chemistry)

CO 1: Stereochemistry of organic compound; Optical isomerism; Elements of symmetry,

molecular chirality, stereogenic centre, optical activity, Enantiomers & their properties, chiral

and achiral molecules with stereogenic centre. Diastereomers and meso compound. Resolution of

racemic mixture, relative and absolute configurations, Representation of configuration by Fischer

and flying wedge formula. Threo and erythro nomenclature of diastereomers having two chiral

centres, sequence rules, D, L and R, S system of nomenclature.

CO 2: Geometrical isomerism: Restricted rotation about double bond, geometrical isomerism

about C=C and C=N, specification of configuration by cis trans and E-Z system, basic idea

geometrical isomerism in alicyclic compounds.

CO 3: Conformational isomerism: conformational analysis of ethane, propane, and n-butane,

Representation of conformations by Newman and sawhorse projection formula, difference

between configuration and conformation. Conformation of cyclohexane and its monosubstituted

derivatives.

CO 4: Active methylene compounds; Acidity of α -hydrogen. Preparation of ethyl acetoacetate

and diethyl malonate and their application to organic synthesis, keto-enol tautomerism of ethyl

acetoacetate and β -dicarboxyl compounds.

CO 5: Hydroxy Acids:- general method of preparation and properties of α , β and δ -hydroxyl

acid with special reference to lactic, tartaric & citric acids. Structure of tartaric acids.

CO 6: Carbohydrate:- classification and nomenclature. Glucose; open-chain structure,

mechanism of osazone formation. Conversion of glucose into fructose and vice-versa, chain

lengthening and chain shortening of aldoses. Configurations of D & L- glucose. Determination of

ring size of Glucose & fructose, cyclic structure of D glucose:- α & β D-glucose & furanoses,

mutarotation, mutarotation of glucose.

CO 7: Aromatic chemistry:- Aromaticity; the Huckel's rule. aromatic, nonaromatic and

antiaromatic structure of benzene, resonance and resonance energy of benzene, electrophilic

aromatic substitution; general pattern of mechanism, role of σ & π - complexes, mechanism of

nitration, halogenations, sulphonation and Friedel-Craft reaction. Directing influence of

substituents in aromatic substitution and their activating and deactivating effect, ortho-para ratio

in substitution reaction.

CO 8: General methods methods of preparation and reaction of arenes and monofunctional

benzene derivative like amines, phenols, aldehydes, ketones, carboxylic and sulphonic acids.

Synthesis of organic compounds via diazonium salts

CO 8: Name reaction and their mechanism: - (i) Cannizzaro, (ii) aldol condensation, (iii) Reimer-Tiemann, (iv) Sandmeyer, (v) Perkin reaction, (vi) Reformatsky reaction, (vii) Wurtz-Fittig reaction,

(viii) Wolf-Kishner (ix) Knoevenagel reaction, (x) Williamson ether synthesis.

Third Year

Paper No. V

Name of the Paper: Physical Chemistry

CO 1: Electrochemistry : Galvanic cells, thermodynamics of Galvanic cells, chemical cells with

and without transference, liquid junction potential, Glass electrode for the measurement of pH,

Storage batteries, Lead accumulator, Polarisation, Hydrogen and Oxygen overvoltage,

Decomposition voltage in aqueous solution, Electrical double layer, corrosion of metals and its

Prevention.

CO 2: Wave Mechanics: Inadequacy of classical mechanics, Wave, quanta and motion of

vibrating string, basic concept of quantum mechanics, postulates, eigen function and eigen

value, physical properties of wave function, orthogonality and normalization of wave

functions, Schrodinger wave equation and its importance, Treatment of free particle and particle

in one, two and three dimensional boxes, rigid rotator – expression for energy rotational quantum

number and degeneracy of states.

Elementary idea of H atom, radial and angular parts of wave functions R , Θ and ψ ,

concept of quantum numbers

and their significance, radial distribution functions, radial factors, R_{nl-r} , R

2

$n^2 - r$ and $4\pi r^2$

R^2

m-r

plots. Angular dependence of orbitals-shape of s, p, and d orbitals, concept of electronic spin.

CO 3: Spectroscopy: Component of molecular energy and their quantization,different parts of

electromagnetic radiation and their characterisation, energy level spacings and relative

population among levels, types of molecular spectra, band width, band intensity and position of

spectral bands.

UV-visible spectra: Franck-Condon principle, selection rules, λ and ϵ max

values,Qualitative description of α,π and n molecular orbitals, transitions in

H₂,ethylene,butadiene, formaldehydes, α,β ,unsaturated carbonyl compounds.Red and blue

shifts,calculation of λ max,Woodward rules.

Infrared spectra: Energy levels of simple harmonic oscillator, selection rules, Hooke's law and

force constant, qualitative relationship between force constant, bond length, bond angle,bond

angle, bond order,bond energy, and stretching frequency of molecules,vibrational spectra of

H₂O,NO₂ and CO₂,concept of group frequency.

CO 4: Magnetic Resonance Spectra: n.m.r.spectra, nuclear spin system nuclear spin quantum

number, nuclear spin angular momentum, nuclear magnetic moment, nuclear magneton, effect of

magnetic field on system with nuclear spin, nuclear energy levels, magnetic quantum number for

nuclear spin, energy level separation and resonance condition in a magnetic field

n.m.r., Chemical shift, factor affecting chemical shift, shielding and deshielding mechanisms,

nuclear spin-spin coupling, coupling constant and contributing factors to it, first order rules.

e.s.r. spectra: Electronic spin system, electronic spin quantum number, electron spin angular

momentum, electron spin magnetic moment, Bohr magneton effect of magnetic field on

electronic spin system, electron spin energy levels, magnetic quantum number for electronic

spins states, separation between energy levels caused by the presence of magnetic field, condition

for electron spin resonance, selection rule, derivative curve, hyperfine coupling, hyperfine

coupling constant, spectra of H₂, CH₃, CH₃OH, N₂O, C₆H₆

CO 5: Equilibrium Thermodynamics: Maxwell relations, thermodynamic equation of state, free

energy change in a chemical reaction and equilibrium constant, thermodynamic derivation of law

of mass action. Denuder's concept of chemical equilibrium constant, van't Hoff equation, Nernst

heat theorem, third law of thermodynamics and its experimental verification, entropy and

probability.

CO 6: Theories of Rate Process: Derivation of Maxwell law of distribution of velocities of

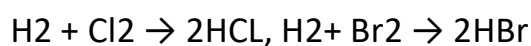
gaseous molecules. Average R.M.S. and most probable velocity, Collision theory of bimolecular

reaction and its validity. Transition state theory-thermodynamic treatment activation parameters

viz volume of activation, free energy of activation and Entropy of activation.

Steady state approximation and rate law for thermal decomposition of ozone, N₂O₅ and

non-photo chemical combinations of



CO 7: Photochemistry: Primary and secondary photochemical processes, laws of photochemistry, Jablonski diagram, radiative and non-radiative transitions, quantum efficiency

and its variation.

Photochemical reactions : $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$,

$\text{H}_2 + \text{Br}_2 \rightarrow 2\text{HBr}$, decomposition of HI, fluorescence and phosphorescence, photosensitization.

Name of the Paper VI: Inorganic Chemistry

CO 1: Principles of linear combination, criteria of maximum overlapping for effective

combination, Energy and probability plots of bonding and anti-bonding molecular orbitals in

H₂⁺ energy versus internuclear separation in H₂ both for attractive and repulsive states, nonbonding MO and three centre bonding, valence bond wave functions of H₂ molecule,

quantitative description of sp, sp² and sp³ hybrid orbitals and inter orbital, comparison between

V.B. and M.O. Methods.

CO 2: Diamagnetic, Paramagnetic, Ferromagnetic and antiferromagnetic behaviour,

Paramagnetic susceptibility and method of its determination, Variation of magnetic susceptibility

with temperature, Curie and Neel temperature, Ground Term Symbol and Hund's rule,

dependence of magnetic moment value on L.S. and J quantum numbers, spin only magnetic

moment, quenching of orbital angular momentum, magnetic moment data in case of transition

metal complexes.

CO 3: V.B. model of M-L bonding and its limitations, crystal field model-d-orbital splitting in

OH and T environment, Crystal field splitting parameter ($10Dq$) and factors affecting it, crystal

field stabilisation energy, magnetic properties and colour of complexes, variation of ionic radii of

M^{2+} ions in 3d series. Thermodynamic stability constants and factors affecting stability of

complexes, chelate effect, entropy effect.

CO 4: Nuclear stability and binding, artificial radioactivity, positron emission and β -decay

process, Nuclear fission, Liquid drop model, nuclear chain reaction, moderator, nuclear fusion

reactions, neutron activation analysis, isotope dilution methods, isotope effect and isotope

exchange reactions.

CO 5: Types of electronic transition, selection rules for electronic transition, spectrochemical

series. Free ion ground terms and Orgel diagram for d^1 to d^9 systems in octahedral and

tetrahedral fields, visible spectra of $[Ti(H_2O)_6]$

$3+$ ions.

CO 6: Classification of metals into A and B, acid-base behaviour of hard and soft acids and

bases, classification, their acid-base strength, hardness-softness, symbiosis theory of hardness

and softness, electronegativity.

CO 7: Classification of polymers, chemistry of inorganic ring and chain compounds containing

boron, nitrogen, phosphorous and silicon atoms.

CO 8: (a) Complexometric titration using EDTA, estimation of Mg^{2+} ion and Ca^{2+} (b)

Chromatographic technique : Principles of TLC and gas chromatography, determination of R_f

values (c) Introduction of Colourimetry, coulometry and flame photo metry.

Paper VII Organic Chemistry

CO 1: Reaction mechanism:- methods of determination of reaction mechanism (product

analysis , intermediates, use of iso isotopes , cross over experiment, stereo – chemical studies.)

Mechanism of nucleophilic substitution reaction at saturated carbon atom SN_1 , SN_2

, and SN_1

relative reactivity of alkyl halides, allyl, vinyl and aryl halides α and β – Elimination reaction.

E_1 and E_2 mechanism and their region & stereo selectivities, electrophilic addition to carbon–

carbon multiple bond, Regio & stereo selectivities, Nucleophilic addition to carbon – oxygen

double bond.

CO 2: Reagents use in organic synthesis :- Diazomethane , lithium aluminium hydride, sodium

borohydride, diborane, N-bromo succinimide, Raney nickel and osmium tetroxide. Discussion on

specificity of the reagents & mechanism involved,

CO 3: Organic reactions and molecular Rearrangement: (i) mannich reaction, (ii) Michael

addition reaction (iii) hofmann exhaustive methylation and elimination , (iv) wagner – meerwein

rearrangement, (v) wolf – rearrangement, (vi) hofmann rearrangement ,(vii) Beckmann

rearrangement ,(viii) Curtis rearrangement, (ix) Schmidt rearrangement, (x) pinacol –pinacolone

rearrangement .

CO 4: Polynuclear Hydrocarbons : preparation , properties and structure determination of

naphthalene, anthracene and phenanthrene.

CO 5: Heterocyclic compound:- (a) five membered heterocyclics; preparation, properties and

aromatic character of pyrrole , furan and thiophene (b) six membered heterocyclics; preparation

, properties and aromatic character of pyridine (c) condensed heterocyclics ; preparation and

properties of quinoline and isoquinoline.

CO 6: Dyes; classification, correlation of colour with constitution, chemistry of the following

dyes; methyl orange, congo-red, malachite green , crystal violet, phenolphthalein, fluorescein,

alizarin and indigo.

CO 7: Ureides:- purines, isolation, structure and synthesis of uric acid.

CO 8: (a) amino acids and properties:- Classification structure and stereochemistry of amino

acids, acid- base behaviour, isoelectric point and electro-phoresis preparation and reaction of α amino acids. Peptide linkage, basic idea about primary and secondary structure of proteins.

Nucleic acids: Brief knowledge of purine bases. D-Ribose and de – ribose. Constitution of

nucleic acid and basic idea and double helix structure of D.N.A.

Paper No. VIII

Title of the paper: Practical Chemistry

CO 1: 1. To determine the specific reaction rate of hydrolysis of methyl acetate catalyzed by

H⁺ ion at room temperature.

2. To compare strength of HCl and H₂SO₄ by studying the kinetics of hydrolysis of ethyl

acetate.

3. To determine the distribution coefficient of iodine between water & CCl₄.

4. To determine the surface tension of a liquid.

5. To determine the heat of neutralization of NaOH with HCl

6. To determine enthalpy of neutralization of acetic acid using NaOH solution and determine

enthalpy of ionization.

7. To determine the viscosity of a liquid.

CO 2: Synthesis of organic compounds: (i) Acetylation of salicylic acid (ii) Benzoylation of

aniline (iii) Nitration of monobenzene to m-dinitrobenzene (iv) Selective reduction from

dinitrobenzene to m-nitroaniline.

Chemistry

Programme specific Outcome (PSO)

The undergraduate students of B.Sc (H) are expected to manifest the attributes as

follows:

P.O. 1- Knowledge and understanding

Students would be in a position to understand the concepts, analyse and assess information

on Physical, Inorganic and Organic Chemistry. They would be able to understand theories

and develop their problem solving ability.

P.O.2- Problem Analysis

Students are able to analyze the inorganic salt mixture, organic compounds, cement, antacid

tablets, after hands on experience in analyzing them

P. O. 3- Design solutions

To introduce analytical and experiential learning in the laboratories as well as in industries to

enable students to design the solutions

P. O. 4 -Conduct Investigations

To inspire the curiosity and perceptive mind set for the in-depth thoughtful and to ignite

research perspective among learners.

P. O. 5- Applications To understand the analyses of different Chemicals and relate the knowledge to provide

themselves to job requirements in the quality control, analytical laboratory or production wing of

any Chemical or Pharmaceutical industry.

P. O. 6- Team Work

To build up the team spirit and co- ordination through experiential and investigative

laboratory learning.

P.O. 7- Effective communication and experimental skills.

All the learners are able to grab the perceptive of subject during observation and patient

investigation and respective Chemistry language skills by reading books, listening to lectures and

TED talks and writing Chemistry related notes and research papers.

P.O. 8- Social Interaction

Social consciousness, heritage awareness and environmental awareness are key indicators to

be developed by giving importance to why a topic is introduced at that third part.

P.O. 9 Effective Management and Finance

Knowledge and skills required for higher education and employability in Chemical industries.

P.O.10 Ethics -

Recognise the value system of the modern world and accordingly exhibit empathetic social

concerns.

P.O. 11- Environment & Sustainability Students are able to understand the analyses of: Pesticides, Fuel, Fertilizer and Plant, Blood,

Urea, Honey, Butter, Wheat flour, Meat, Beverages like alcohol, tea, coffee, soft drinks,

Paints, Pigments, Polymers, leather dyes, milk analysis, analysis of Oils and Fats etc. and

taking necessary steps to play the role in environment and sustainability.

P O 12- Lifelong Learning

The experiential learning methods build up the fundamental aspirations to engage in ongoing

research in industry and laboratory.

PSO –Chemistry

PSO-1-Understand the basic principles and concepts underlying the inorganic, organic and

physical chemistry and different instruments such as UV-vis Spectroscopy, Potentiometer,

Colorimeter, Chromatography etc.

PSO-2-Comprehend the application of chemistry in various walks of life.

PSO-3 Perform procedures as per laboratory standards in the areas of analytical chemistry,

inorganic chemistry, organic chemistry, Pharmaceutical chemistry and physical chemistry.

PSO- 4-Able to use instrumental methods of chemical analysis

Physics

Course Outcomes:-

With the advancement of Science and Technology and keeping the view of industrial and scientific applications, following course have been introduced for the under graduate students of physics. Apart from these particular emphasis has been given to the selection of the courses

which full fill the requirement of the job for the students.

Course introduce for under graduate students

COs - General Properties of Matter, Thermal Physics, Optics, Electricity and magnetism, Mechanics, Modern Physics, Electronics, Solid state Physics, Atomic and molecular Physics, Mathematical methods.

CO1 General properties of matter deals with the physical properties of matter such as mass, volume, density, etc. it is divided into two parts 1. Intensive properties of matter 2. Extensive properties of matter. In this section student will learn about elasticity, surface tension, viscosity , gravitation , etc.

CO2 Thermal physics:- In this part of the physics the effect of heat (thermal energy) on the basic properties of matter is studied. Laws of thermodynamics and

their application are also taken into account, from which all the thermodynamic properties can be deduced. In addition to these low temperatures production may also be consider in this thrust area. In this part Student will able to know about the measurement of temperature, laws of thermodynamics, entropy, Carnot Engine, working principle of refrigerator, phase transition and production of low temperature.

CO3 optics :- In this branch of physics right from laws of reflection and refraction different phenomena such as scattering, diffraction, dispersion and polarization of light are considered for study and investigation

CO4 Electricity and magnetism :- After successful completion of the course student will able to understand the principle operation of AC and DC circuit, how to calculate current and voltage in a circuit using different technique, properties of magnetic material, thermoelectricity effect, principle of superconductor, etc.

CO5 ELECTRONICS: After successful completion of the course student will be able to understand the basic operation of semiconductor diode, BJT, FET, MOSFET, design and analyze of electronic circuit and also the Boolean algebra for digital circuit.

CO6 Optics: After successful completion of the course student will be able to know the lens formula, Fermat principle, working principle of interference, diffraction, polarization and principle of laser.

CO7 Atomic and Nuclear physics: After successful completion of the course student will be able to know about the development of atomic model (Thompson model to vector model), radioactivity, nuclear model, cyclotron, betatron, other particle accelerator, principle of fission and fusion, properties of elementary particle and different quantum numbers for nuclear reaction.

CO8 MODERN PHYSICS: After successful completion of the course student will be able to know about the origin of quantum mechanics, photoelectric effect,

black body radiation, Compton effect, xray diffraction, cosmic ray, special theory of relativity.

CO9 Mathematical methods of physics:

For various need of calculation in different branch of physics the following mathematics are introduced in the course.

Vector calculus, curvilinear co-ordinate, complex algebra, Fourier analysis, polynomial function, elementary of tensor analysis.

Program Outcome

Department of Commerce

Under Graduate

PO – 1: After completing three years for Bachelors in Commerce (B.Com) program, students

would gain a thorough grounding in the fundamentals of Commerce and Finance.

PO – 2: The commerce and finance focused curriculum offers a number of specializations and

practical exposures which would equip the student to face the modern-day challenges in

commerce and business.

PO -3 This course offer a number of value based and job oriented courses which enable our

students to be well trained and up-to-date. In advanced accounting courses beyond the

introductory level, affective development will also progress to the valuing and organization

levels.

Post- Graduate

PO 1: Enriched knowledge with new ideas and techniques essential for business and

management.

PO 2: Mastery over specific skills in business.

PO 3: Capability to acquire and handle any position in business.

PO 4: Develop analytical interpretative and presentation skill regarding research in commerce

and management.

PO 5: Acquaintance with recent trends in commerce and management.

Bachelor of Arts

Program Outcome

PO 1: The undergraduate students develop basic understanding about humanities, social values,

economy, historical events, and political issues based on their interest and subject selection.

PO 2: They can pursue other career options like Journalism, Tourism, Judiciary (Law),

Linguistics, etc. They are eligible to appear for any competitive exams conducted by Union

Public Service Commission (UPSC), Bihar Public Service Commission (BPSC), Indian Railway

Board, etc for entering into the government services. They also pursue their studies in doing

MBA, Post Graduate Diploma in Computer (PGDC), Certificate Courses of any discipline.

PO 3: B.A. graduates can pursue B.Ed. course and opt teaching career in the schools. In addition

to this, students can also pursue Post Graduate Studies in their respective subjects.

PROGRAMME SPECIFIC OUTCOME

B.A. Economics

PO1: Economics students in general will be able to pinpoint and understand the past, present

economic conditions of the country. They will also be able to forecast the future course of

changes and development through their knowledge of policies and programmes set by the

governments and other development agencies. They are equipped with the techniques to find

solution of the problems like mobilization of manpower and materials available in the country.

PO2: Economics studies how nations, governments, organizations, household, and people

allocate their scarce resources. Our subjects has two significant characteristics. To begin with,

we create calculated models of behavior to forecast reactions to changes in policy and economic

situations. Second, we utilize statistical analysis to explore these changes.

PO3: As the Under Graduate Course (UGC) contains the fields like statistics, mathematics and

economics principles, it enhances them to compute and assess the real situation of the economy

including the size and changes of population, income pattern, nature of an extend of

employment, rate of development with pattern of investments and savings, policies in relation to

other countries, and social security measures adopted in the country.

PO4: Basically, economic graduates are familiar with the knowledge and application of

microeconomics and macroeconomics for the formulation of policies and planning. They are

equipped with all the relevant tools/ knowledge based on economic principles including market

functions and structures, efficiency in manpower and resources management, need of

credit/finance for initiating and accelerating projects.

.A. Course Outcome

Paper-I: Micro Economics

CO1: This paper of economics helps student to understand the nature and scope of Economics. It

enables them to distinguish between two major branches of Economics i.e. Micro and Macro

Economics.

CO2: Micro Economics explain how optimum utilization can be done from scarce resources. It

discusses about what to produce, how to produce and for whom to produce.

CO3: It makes students capable of analyzing theory of Consumption via two approach, firstly

Utility Analysis and secondly Indifference curve Analysis.

CO4: This paper also explains the concept Elasticity of Demand and enables student to forecast

the demand for product and helps in decision making to business firms.

CO5: It enables student to explain the concept of Cost and Revenue, analyze the features of Cost

curves and Revenue Curves.

CO6: Micro Economics explain the concept of Production Function and helps in examining the

Law of Returns to scale and nature & features of Isoquants.

CO7: Students learn to examine price determination under Perfect Competition, Monopoly and

Monopolistic competition and enables them to compare between the price determination in

different forms of market.

Paper-II: Macro Economics

CO1: Macro Economics helps students to understand the concept of Money. It explains the Role

of Money in the economic system and discusses Value of Money.

CO2: This paper explain the Transaction and Cash-Balance Approach of the Quantity theory of

Money, Income and Expenditure Approach. Macro Economics discusses a very important aspect

of inflation, inflationary gap, and methods to control inflation.

CO3: Students understands the meaning of National Income, its component. This paper also

discusses the theory of Income determination and critically evaluate Keynesian theory of

Effective Demand, Consumption Function, Multiplier Liquidity Function, Investment Function.

CO4: Students get to learn the process of banking system. It tell students about the principles of

Commercial Banking, Credit Creation, Function of Central Bank, Methods of Credit control.

CO5: This papers explains students the role of International Monetary System, Gold Standard,

I.M.F., I.B.R.D., I.F.C. and I.D.A.

CO6: Macro Economics help to learn about the trade relation between an economy with rest of

world. It helps in examining the role of International Trade in Economic development.

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Paper-III: Economic Problems of India since Independence

On completion of the course students will be able to:

CO1. Develop ideas of the basic characteristics of Indian economy, its potential on natural

resources.

CO2. Understand the importance, causes and impact of population growth and its distribution,

translate and relate them with economic development.

CO3: Grasp the importance of planning undertaken by the government of India, have knowledge

on the various objectives, failures and achievements as the foundation of the ongoing planning

and economic reforms taken by the government.

CO4: Understand agriculture as the foundation of economic growth and development, analyse

the progress and changing nature of agricultural sector and its contribution to the economy as a

whole. Agriculture Labour: Wage and Living conditions, Minimum wage legislation and its

implementation

CO5: Understand the importance of Land Reform and abolition of intermediaries.

CO6: Explain the concept of Credit: Sources of credit. Co-operatives credit system, Land

Development Banks, Nationalized Commercial Banks, Lead Bank Scheme; Rural Bank,

NABARD.

CO7: Understand the concept of Industries: Industrial Policy since 1956, 1977 and 1980, role of

public sectors in India's economic development, Large industries-iron and steel. Sugar; cotton,

textile and cement. Small scale industries, their role in economic development, problem of small

scale and cottage industries, small scale industries under Five Year Plans.

Paper-IV: Public Economics

On completion of the course students would be able to:

CO1. Understand the sources of finance both public and private, demonstrate the role of

government to correct market failures and possible advantage of public financing.

CO2. Attain the advantages and knowledge of public investments and other government

expenditures. Understand the causes of growing public expenditures for various programmes and

policies within and outside the country.

CO3. Understand the possible burden, benefits and distribution of various types of taxes among

various classes of people, know the general trend and impact on general welfare and arouse them

to suggest good and bad tax system.

CO4. Understand the needs of public borrowing from all possible sources to meet necessary

public investment/expenditures. Also be alerted to find sources for repayment.

CO5. Deliver effectively the preparation of budget and how they are passed in the house.

Understand the changes in size and flexibility of state and central budget along with the role

played by Finance commission

Paper-V Principles of Economic Growth and Planning

On completion of the course students would be able to:

CO1: Understand the meaning of Economic Growth and its measurement.

CO2: Develop the ideas of factors affecting Economic Growth: Economic and Non-Economic

factors. Role of State in Economic Growth.

CO3: Examine the characteristics of under-developed economy, Evaluate the role of capital

formation in economic growth, foreign capital and economic growth.

CO4: Evaluate the role of Population in Economic Growth, Technology and Economic Growth.

CO5: Ability to distinguish between different stages of economic growth and their specific

features.

CO6: Explain the importance of Planning: Need for planning, Objectives of Planning.

Distinguish between types of planning; Planning by Inducement and Planning by Direction;

Physical and Financial Planning; Capitalistic and Social Planning.

Paper-VI Economic Development of U.K., U.S.A., U.S.S.R and Japan.

On completion of the course students would be able to:

CO1: Develop the ideas about the economic situation of four important economy (UK, USA,

USSR and Japan) of the world.

CO2: Critically evaluate the steps and policies taken by the different nations to overcome their

economic adversities.

Paper-VII Statistics and Field Work

On completion of the course students would be able to:

CO1: Explain the concept and scope of statistics

CO2: Calculate the three important measures of Central tendency (Mean, Median and Mode).

CO3: Calculate the Measures of Dispersion- Mean Deviation and Standard Deviation.

CO4: Frame questionnaire, conduct primary survey and collect primary data. Differentiate between Primary and Secondary Data.

English

Honours

Part one

Paper one

History of English Literature

Authors

William Wordsworth

Alexander Pope

Charles Dickens

Mathew Arnold

Chaucer

Langland

Beowulf

Edmund Spenser

William Blake

Ben Jonson

P B Shelley

John Keats

S. T. Coleridge

T. S. Eliot

D. H. Lawrence

Thomas Carlyle

E. M. Forster

G. B. Shaw

Paper Two

A. Palgrave's Golden Treasury selected by John Press (O.U.P.)

Pieces prescribed

- i. Shakespeare A Consolation
- ii. Ben Jonson To Celia
- iii. Marvel Thoughts in a Garden
- iv. Vaughan The Retreat
- v. Herbert The Gift of the God
- vi. Wordsworth Composed upon Westminster Bridge
The world is too much with us
To the Skylark
- vii. Coleridge All Thoughts All Passions (Love)
- viii. P.B. Shelley To a Skylark
- ix. John Keats On First Looking into Chapman's Homer
Ode to the Nightingale
- x. Byron She Walks in Beauty
- xi. A. Tennyson Now fades the last long streak of snow
Now sleeps the crimson petal
- xii. R. Browning To in the Campagna
- xiii. M. Arnold Dover Beach

B. The Eve of St. Agnes by John Keats

C. Mac Flecknoe by John Dryden

Distribution of Marks

1. Two passages from Golden treasury Out of Four
2. One each (Out of two longer poems)

Explanation $8 \times 4 = 32$ Marks

Four Critical Questions $15 \times 4 = 60$ Marks

Two questions from the golden treasury $15 \times 2 = 30$ marks

3. Prosody a. scanning a passage 4 marks

b. definition of prosodic terms and figures of speech 4 marks

Part Two

Paper Three

Time 3 Hours Full Marks 100

Drama

The following Plays are prescribed:

Marlow Edward the Second

Shakespeare Othello, As You Like It

Sheridan The Rivals

Explanation 8x4 =32 Marks

Four Critical Questions 17x4 = 68

Paper Four

Time 3 Hours Full Marks 100

Prose

A. Sushankar K Sinha (O.U.P.) English Essayists

The pieces prescribed

1. Bacon Of Studies

2. Oliver Gold Smith Beau Tibbs

3. Charles Lamb Dream Children

4. G. K. Chesterton The Pleasure of no longer being very young

5. A.G. Gardiner On Superstition

6. Robert Lynd The Money Box

7. Hillaire Belloc In Praise of Ignorance

8. Aldous Huxley Pleasures

B. Emily Bronte Wuthering Heights

C. Thomas Hardy Mayor of Casterbridge

D. Modern Short Stories II Series (O.U.P.)

- The Kite
- The Duchess and the Jeweller
- The Vertical Ladder
- The Basement Room

Critical Question

Appreciation

Part Five

Three Essays by T. S. Eliot

Principles of Literary Criticism

Shakespeare's Criticism

Ben Jonson

John Dryden

Dr. Samuel Johnson

S. T. Coleridge

Thomas De quency

Practical Criticism

Paper six

British Literature

E M Forster: A Passage to India

G. B Shaw Candida

Huxley : Essays

Palgrav's Golden Treasury

Paper seven

Indo Anglican Literature

R K Narayan The Guide

Raja Rao Kanthapura

Mulk Raj Anand Untouchable

Indo Anglican Poems

Anthology

Paper Eight

Essays

General Essays on Modern Topics

Literary Essays on Prose, Poetry, Novel, Modern Poetry, Drama, Criticism and

Essays

Course Outcome M.A. English

Semester one

Course 1 English Poetry from Chaucer to Milton

Unit I Chaucer

UNIT II Spenser

Unit III Shakespearean sonnets

Unit IV Metaphysical poetry John Donne Herbert Marvel

Unit V Milton

This course provides a panoramic structure from Chaucer to Milton. It will enable the

understanding and interpretation of poetic production in relation to its historicity, culture and

inheritance drawn from classical greek antiquity and continental influences in relation to

thematic patterns and forms.

Course Two Shakespeare Drama

Unit I Hamlet

Unit I I King Lear

Unit III The Tempest

Unit IV Twelfth Night

Unit V Henry IV Part one

Course Outcome

This course will enable the learner to gain Knowledge of different dramatic form used by

Shakespeare. It will also enable students to revisit , Shakespearean drama as a cultural

production with relation to contemporary society and culture.

Course Three

15th to 17th century Drama

Unit I Thomas ; Kyd: The Spanish Tragedy

Unit I I Marlow: Dr Faustus

Unit I II Ben Jonson: Volpone

Unit I V Webster: The Duchess of Malfi

Unit V Afra Behn: The Rover

Course Outcome

This course offers a spectrum of different kinds of Drama beginning with a morality play and

concluding with a woman dramatist who wrote comedy of manner.

Course Four Late seventeenth and eighteenth Century Literature

Unit I Pope: An epistle to Dr. Arbuthnot

Unit II Swift: Gulliver's Travels

Unit III Gray: An Elegy written in a country Churchyard

Unit IV Fielding: Tom Jones

Unit V Blake: Songs of Innocence and Experiences

Course Outcome

Ability Enhancement Compulsory Course

Environmental sustainability 3 credits

Swachh Bharat Abhiyan Activity 2 credit

Semester Two

Even Semester

Course Five Film and Literature

Unit I a. Key terms

b. Novel Rabindra Nath Tagore, Home and the World 1916

Film Satyjit Ray Ghare Baire 1984

Unit II Novel, Khushwant Singh, Train to Pakistan, 1956

Film Pamela Books: Train to Pakistan 1998

Unit III Novel, E. M. Forster, A Passage to India, 1924

Film David Lean, A Passage to India, 1984

Unit IV Novel Herman Hesse Siddartha, 1951

Film Conrad Rooks, Siddartha 1972

Unit V Novel Harper Lee To Kill a Mocking Bird 1962

Film: Robert Patrick: To Kill a Mockinbird 1962

Course Outcome

Course Six 19th century Poetry (70 Marks)

Unit I Wordsworth: The Prelude Book one

Unit II Coleridge: Dejection an Ode,

Unit III Byronon Juan Book I and II

Unit IV a. Browning: Rabbi Ben Ezra, Porphyria's Lover, Love Among the Ruins, A

Grammarians's Funeral

b. Tennyson: In Memorium

Unit V Hopkins God's Grandeur, The Windhover, Pied Beauty, The Starlit Night

Course Outcome

Course Seven

Indian and British Criticism

Unit I

A. Introduction and Key concepts – Rasa, dhvani, alankar, Vakrokti

Arthprakriti, pratimukh, sphot

B. Bharatmuni: On Nyay and rasa: Aesthetic and Dramatic Experience

C. Anandvardhan: The Structure of Poetic Meaning

D. Kuntak: Language of Poetry and Metaphor

E. Amir Khusro: Multilingual Culture

Unit II Aristotle: Poetics, Longinus: Peri hypsos (on the Sublime)

Unit III John Dryden: An Essay of Dramatic Poesy, Dr Johnson: Lives of Poets,
(Milton Cowley and Pope), Coleridge: Biographia Literaria, Ch 13 14 17 18

Unit IV Lawrence: Why the Novel Matters, T S Eliot Metaphysical Poetry, Hamlet
and

his Problems

Unit V Practical Criticism: one passage either from poetry or from prose – long
answer question

Course Outcome

Indian literary theory will engage students in understanding the intricacies of
the craft of

aesthetic production affecting a decolonized recovery of the importance of
Indian

aesthetic traditions. This course will provide insight into the historical
development of

criticism from Aristotle to the advent of theory in the twentieth Century.

Course Eight

Modern and Contemporary Critical Theory

Unit I From Liberal Humanism to Theory

a) Formalism

i. Introduction to Formalism

Key terms' Three Phases: Machine, Organic, System, Fabula, Suzhet,

Defamiliarisation (ostranenie)

ii. Roman Jakobson: Two Aspects of Language

iii. Victor Shklovsky: Art as Technique

iv. Boris Tomashevsky: Thematics

b) Structuralism

Introduction to Structuralism: Key terms, Sign Signifier, Signified Langue

parole, Mythemes, Binaries

c) Saussure Course in General Linguistics

d) Narratology Introduction to key terms: Subject, Predicate, Functions, D

esire,ommunication, Auxiliary Support, Histoire recit, Narration, Mimesis,

Diegesis, (Hetrodiegetic, Homodiegetic, Autodiegetic) Focalisation, Analepsis,

Prolepsis

e) Vladimir Propp Mythology of Folk Tales

f) Gerard Genette Narrative Discourse (Excerpts from Rivkin and Ryan)

Unit II Psychoanalysis, Feminism, Eco Criticism

Psychoanalysis

i. Freud: Beyond the Pleasure Principle (excerpt)

ii. Lacan: Insistence of the Letter in the Unconscious

Feminism

Virginia Woolf: Introduction to a Room of one's own

Spivak: Three women's Text and a critique of Imperialism

Eco criticism and Green Studies

i. Cheryl Glofelty: Introduction to Ecocriticism Reader

ii. Patsy Hallen: Making Peace with Nature: Why Ecology Needs Feminism

Unit III Marxism, New Historicism, Cultural Materialism, Post Colonialism

i. Marxism

a) Marx: From Capital (From Rivkin and Ryan)

b) Max Horkheimer and Adorno: The Culture Industry as Mass Deception

ii. New Historicism

a) Nancy Armstron: On the Politics of Domesticity

b) Louis Montrose: Professing the Renaissance: The Poetics and Politics of Culture

iii. Post Colonialism

a) Homi Bhabha: Signs Taken For Wonders

b) Ania Loomba: Colonial Studies

Unit IV Post Structuralism

i. Post Structuralism

a. Derrida: Structure, Sign and Play in the Discourse of Human Sciences

ii. Discourse and Power

b. Foucault: We "Other Victorians"

Unit V Postmodernism

a) Lyotard: The Post Modern Condition

b) Baudrillard: Simulacra and Simulations

c) Deleuze and Guattari: A Thousand Plateaus

Course Outcome

Course Nine

Nineteenth Century Fiction and non Fiction

Unit I Jane Austen: Emma

Unit II George Eliot: Mill on the Floss

Unit III Charlotte Bronte: Jane Eyre

Unit IV Charles Dickens: Hard Times

Unit V: Mathew Arnold: Culture and Anarchy

Course Outcome

The study of Victorian Literature should foster the understanding of the gradual establishment of

democracy, the utilitarian attitude on account of striking material prosperity, the expansion of the

British Empire, the effects of the aftermath of the industrial revolution and the impact of

Darwin's theory of evolution that influenced the literature of the age.

Ability Enhancement Course (AEC 1)

Semester Three

Odd Semester

Course Ten

Modern and Contemporary Poetry

Unit I W. B. Yeats: Adam's Curse, A Coat, No Second Troy, A Prayer for My Daughter, Leda

and The Swan, Byzantium, Easter 1916

Unit II T. S. Eliot: The Waste Land

Unit III

a. W. H. Auden: Musee Des Beaux Arts, In Memory of W. B. Yeats, Though the Night is Gone

b. Stephen Spender: A Childhood, The Shapes of Death

Unit IV Ted Hughes: The Thought Fox, Hawk Roosting

Sylvia Plath: Mirror, Lady Lazarus, Daddy, Metaphor

Philip Larkin: The Whitsun Wedding, Next, Please,

Unit V Seamus Heaney: Digging; The Forge; Punishment; The Skunk; A dream of Jealousy,

Traditions, Punishment, The Railway Children, From the frontier of Writing

Course Outcome

CC - 11 Modern and Contemporary Drama

Unit I Samuel Beckett: Waiting for Godot

Unit II J. Osborne: Look Back in Anger

Unit III Eugene O'Neil: Mourning Becomes Electra

Unit IV Tom Stoppard: Rosencrantz and Guildenstern are Dead

Unit V Edward Elbee: Who is afraid of Virginia Woolf

Course outcome

Modern Drama is born out of responses to a changing world order, family Structures, Existential

Crisis and Absurdity of Life and totalitarian regimes and surveillance. Students will appreciate

the social, historical cultural and political matrix that was expressed in innovative forms using

multiple dramatic techniques.

CC - 12: Modern and Contemporary Fiction

70 Marks 5 Credits

Unit I Joseph Conrad: Heart of Darkness

Unit II James Joyce – A Portrait of the Artist as a Young Man

Unit III Chinua Achebe: Things Fall Apart

Unit IV Salman Rusdie: Midnight's Children

Unit V J M Coetzee: Disagree

Course Outcome

The Course will make the students understand fiction from different parts of the world covering

multiple themes styles, ideological persuasions and experiences.

CC - 13: Indian Literature in English and in Translation

70 Marks 5 credits

Unit I Rabindra Nath: Tagore Gora

Unit II Amitav Ghosh: The Shadow Line

Unit III Bama Sangati

Unit IV Girish Karnard: Tuglaq

Unit V

Henry Derozio

Toru Dutt The Lotus

Aurobindo Poetry Cosmic

Consciousness

Nissim Ezekiel Philosophy Lover

R Parthsarthy Home Coming

De souza Sweet Sixteen Meeting

Poets

Rabindra Nath Tagore Breezy April

Sarojini Naidu Village Song

A K Ramanujam Another view of

Grace

Shiv K kumar A Mango Vendor

Kolatkhar Woman The Bus

Agha Shahid Ali Postcard from

Kashmere

The season of the Plains

Cracked Portraits

Course 14 Linguistics

Unit I Descriptive Linguistics

a) Phonetics and phonology of English language- Description of English vowels and

consonants; phoneme and allophone; syllabic structure of English words; stress and

intonation

b) Morphology of English- Morpheme and allomorph, word formation;

Morphophonemics

c) Syntax- 1C Analysis; phrase structure grammar; transformational generative grammar

d) Semantic- Lexical and Grammatical meaning; phrase and sentence meaning; utterance

meaning

Unit II Historical Linguistics

The Origin of English Language, Major Language Families, The Concept of synthetic and

Analytic Language, Scandinavian influences, Latin and French Borrowings, Grimm's Law

and Verner's Law

Unit III Socio Linguistics

Varieties of Language, Dialect, Register, Standard Language, British American and Indian

English, Multilingualism, Bilingualism, Code switching, Code Mixing, Diglossia, Linguistic

relativity, and Linguistic determinism (Sapir whorf hypothesis)

Unit IV

Linguistics and Language Teaching

Teaching English as second Language,

Methods and Techniques of Language teaching

Teaching aids

Teaching Pronunciation

Vocabulary and syntax of English

Contrastive analysis

Error analysis

Testing

Unit V Linguistics and Literature

Style

Russian Formalism

Prague School

Stylistics

Literary Competence

Course Outcome:

Study of Linguistics enable the understanding of the structural and generative aspects of

language, and social, cultural, historical and political factors through which linguistic and

language based context is often determined.

Ability Enhancement Compulsory Course (AEEC) 2:

Human Values and Professional Ethics 3 credits

And Gender Sensitization 2 credits

Semester 4 Even Semester

Elective Course 1

- New Literatures (70 Marks) 5 Credits

Unit I Maria Campbell: Halfbreed

Unit II David Malouf: An Imaginary Life

Unit III Hansda Soevendra Shekhar: The Mysterious Illness of Rupi Bhaskey

Unit IV Micere Githae-Mugo and Ngugi wa Thiong'o: The Trial of Dedan Kimathi

Unit V A Selection of Poems: Margret Atwood: The Moment> Is/Not: Pablo Neruda

- b) American Literature (70 Marks) 5 Credits

Unit I Mark Twain: Huckleberry Finn

Unit II Walt Whitman : Song of Myself

Unit III Robert Frost: Selected Poems

Unit IV Tennessee Williams: A Street Car Named Desire

Unit V Alice Walker: The Colour Purple

- c) Women's Literatures

Unit I Virginia Woolf A Room of One's Own

Unit II Margaret Atwood: The Handmaid's Tale

Unit III Sylvia Plath: Selected Poems

Unit IV Mahashweta Devi: Mother of 1084

Unit V Kiran Desai: The Inheritance of Loss

- d) 16th and 17th Century Prose

Unit I The Bible: The Book of Job

Unit II Bacon: Essays

Unit III Machiavelli: The Prince

Unit IV Thomas Moore: From Utopia. Travel and Trade, Gold and Silver, Moral Philosophy, Delight in Learning, Slaves, Marriage Customs

Unit V John Bunyan: The Pilgrim's Progress

- e) Cultural Studies

Unit I Introduction to Cultural Studies

Unit II Stuart Hall – The Formation of Cultural Studies

Unit III Culture Power and Inequality

Unit IV Gender, Age, Race, Ethnicity, Class caste

Unit v Power, Discourse and the Body

Elective Course 2

PHILOSOPHY (Hons)

COURSE OUTCOME (COs) OF BACHLER OF ARTS PHILOSPHY

PART-1

COs1- Study the basic features of philosophy

COs2- Explain the epistemology, ontology and ethics of CHARVAKA, bondage and

liberation philosophy of JAINA

COs3- Discuss the eight fold path of YOGA

COs4- Define SANKHYA philosophy of satkaryavada, evolution, purusa, prakirti and

bondage and liberation

COs5- Discuss Buddha philosophy of nirvana

Cos6- Study the philosophy of Mimansa and Vedanta, sankara Brahman,world,maya and

soul and refutation of Sankara mayaveda by Ramanuja

COs7- Explain nature of philosophy,its relation to science and religion

COs8- Discuss ontological and epistemological theories of materialism, idealism, neutralism, monism, dualism, pluralism, rationalism, criticism and realism

COs9- Define theories about God, polythenism, panthenism, thenism ,denism, creationism and evolution and Darwin theory of evolution

COs10- Explain theories of truth and causality

Ethics –

Program specific outcome

Pos. The course discusses the ethical and non-ethical values in today's life so that a

a student may groom himself with an ethical code of conduct and serve humanity.

Course Outcome

Cos 1. The first chapter deals with the nature of ethics where students come to understand the ethical and non-ethical concept.

Cos2. Description of Ethical concept as right & Good, Duty and obligation.

Cos3. Analytical studies of moral & non-moral actions to categorized human behavior.

Cos4. Analysis of voluntary action to understand human behavior.

Cos 5. Description of postulates of morality to understand moral values.

Cos6. Analytical study of moral judgment.

Cos7. A critical study of motive & intension to understand the features of moral judgment.

Cos8. Learning the standard of morality such as:- External laws-Hedonism, Rigorism, Intuitionism & Perfectionism.

Cos9. Investigation of different theories of punishment – Retributive, Reformative & Deterrent.

Cos10. Conduct investigations of Indian Morality in the context of – Varnashrama

Dharma, Purushartha, Ethics of God

WESTERN PHILOSOPHY

Program-specific outcome

Pos. To understand the basic features of modern western philosophy so one can critically understand the postulates of philosophical learning. Epistemological description enhances the logical part, as well as ontological description, tell us about the relation between God and world/ human being.

Course Outcome

Cos. Descriptive study of Rationalism, Empiricism & Criticism to understand the history of

Modern Philosophy.

PHILOSOPHY OF RELIGION

Program-specific outcome

Pos. Students basically learned the features of religious philosophy and critically analysis the

concept of religion to get rid of the superstitions of dharma and here we examine the religious

belief without following any particular dharma. These types of analysis of religion can help

to build harmony between different religions and the entire world.

Cos1. Describe Religion & define its relationship with science, morality & theology.

Cos2. Discuss Religious consciousness.

Cos3. Discuss the foundations of Religious belief-reason and Faith, Revelation and Mystic

Experience.

Cos4. Different forms of Primitive Religion- Mannerism, Tokenism, Animism, Fetishism and

Spiritualism.

Cos5. Discuss the concept of God with different proofs for the existence of God, Cosmological, Ontological, Causal, Teleological and Moral Proves.

Cos6. Discuss the attributes and personality of God.

Cos7. Describe the problem of Evil-Natural & Moral evil. The theistic solution of the

the problem of evil.

Cos8. Discuss the concept of Unity of Religion and Religious Tolerance.

Cos9. Describe Conversion & Secularism.

SOCIAL PHILOSOPHY & POLITICAL PHILOSOPHY

Program Specific Outcome

PSo1. This course aims to introduce students to practices of argumentation, critical analysis,

and evaluation. Such skills in critical thinking are integral to the discipline of philosophy.

PSo2-They are also tremendously useful in other academic domains, in the workplace, and in

everyday life. The course aims to help students to understand and develop the skills required

for critical thinking.

PSo3. Social & Political Philosophy strongly focuses on fundamental concepts regarding

freedom, politics, power, Justice, conflict, and struggle. The program offers a lively

intentional environment for students so they can make themselves strong enough to analyze

Course outcome

Cos1. Discuss the nature of social philosophy and describe its relation with sociology, Civic

Duty, Individual & Society, Difference between Tradition & Modernity, Concept of caste &

Class, Marriage & Divorce, Private Property & the doctrine of Trusteeship.

Cos2. Political Philosophy its nature & distinction from political science, Philosophical

analysis of different political concepts: Rights & Duties, Liberty, Equality, Justice, Power,

Influence, and Authority, Political Obligation, Political Ideologies, Democracy, Socialism,

Marxism, Communism, Monarchy, Anarchism, Sarvodya, Satyagrah.the present scenario of

the society from a philosophical point of view.

LOGIC AND ANALYSIS

Cos1. Logic: What is Logic, Symbolic Logic, Truth and Validity, Proposition and Propositional Forms. Argument and Argument Forms. Truth and functional propositions and

the determination of their truth value. Truth-tables and Tautologies. Truth-tables and the

validity of Arguments.

Cos2. Analysis: 1. General Introduction 2. Word meaning; Figurative and Emotive meanings.

3. Definition, Definition and Denotation, Definition and Connotation, Definition by

equivalent words, Reporting and Stipulative Definition. 4. Concept and their formation,

Concept and image, Concept and experience. 5. Criteria of the sentence – Meaning, Sentence,

and Proposition.

CONCEPT OF INDIAN PHILOSOPHY

Program Specific Outcome

Pos. This course provides students with the opportunity to study approaches to the basic

features of Indian Philosophy

Course Outcome

Cos. Brahman and Ishwara (Absolute and God). Atman (Self), Bandhan and Moksha, Karma

and Re-birth, Sansara, Maya, Dharma, Sanjnana, Pramanya, Khyati, Karanata, Samanya.

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DEPARTMENT OF PSYCHOLOGY

COURSE OUTCOME (GRADUATION)

B A 1st Year CO:

Paper No. 1.

Name of the Paper: General Psychology

CO 1: Understand the definition and methods of psychology, advantages and limitations of observation and experimental methods.

CO 2: Know the concept of Nervous system: Divisions- Central and autonomic Structure and functions of Spinal Cord and brain, Methods of studying brain

functioning, Theories of cortical functioning, localization and mass action.

CO 3: Understand the concept of Perception: Meaning and Characteristic, Approaches to the study of perception; Gestaltist and Behaviourist. Role of personal

and social factors in perception, Illusion- types and theories.

CO 4: Know the concept of Learning: Meaning, Role of motivation in learning, Theories : Connectionism, Insight, Conditioning Classical and instrumental, discrimination learning-Verbal-learning methods, materials, organizational process.

CO 5: Importance of Remembering and forgetting: Meaning and nature, Reproductive and Reconstructive theories, memorization process and their determinants. Nature and theories of forgetting, retroactive inhibition.

CO 6: Know the concept of Thinking: Meaning and nature, Varieties of thinking, Related concepts-Problem solving and concept formation, Role of set in thinking,

language and thought, Theories of thinking-Central and peripheral.

CO 7: Concept of Emotion: Meaning and nature, Physiological correlates of emotion,

Role of James-Lange, Cannon Bard Activation.

CO 7: Concept of Motivation: Meaning, Basic motivational concepts-Need, Drive,

Incentive, approaches to the psychoanalytic, S-R, cognitive Measurement of biological motives.

CO 8: Understand the concept of Intelligence: Meaning and nature. Theories Spearman, Thorndike, Thurstone, Measurement of intelligence-verbal, non-verbal,

creativity CO 9: Understand the concept of Personality: Meaning and nature, Type and trait

approaches. Determinants of personality-Biogenic and socio-Cultural, Personality

assessment-Questionnaire, and projective technique

B A 1st Year CO:

Paper No. 2.

Name of the Paper: Psycho Pathology

CO 1: Know the brief history of Psycho Pathology. Approaches to psychoanalytic Psycho Pathology, Behaviouristics Humanistic.

CO 2: Know the Concept of mind: Topographical and Dynamic.

CO 3: Understand the of Psycho Pathology of everyday life, Mental conflicts and defense mechanisms, Psycho-sexual development.

CO 4: Know the concept of Dreams: Dream work, Theories of Freud, Adler and Jung.

CO 5: Understand the concept of Psychoneuroses: Difference between neuroses and

psychoses, clinical picture and etiology of Anxiety neurosis, obsessive-Compulsive

neurosis, Hysteria and Neurotic depression.

CO 6: Know the concept of Psychoses: Clinical Picture and etiology of Manic

Depressive psychosis, Schizophrenia and Paranoia.

CO 7: Understand the concept of Psycho-pathic disorder: Types, Clinical Pictures and

Psycho-dynamics.

CO 8: Know the concept of Psycho physiological disorders: Types clinical picture and psycho-dynamics.

CO 9: Understand the concept of Psychotherapy: Psycho analytic Behaviour therapy.

Person-centred therapy.

CO 10: Understand the concept of Mental Retardation: Terminology and clinical classification, causes and rehabilitation.

B A 1st Year CO:

Paper No. 1.

Name of the Paper: General Psychology (Subsidiary)

CO1- Student will be able to understand the subject matter and methods : Kinds of

observation, Intorspectiion, objective observation and experiments, merites and

limitations.

CO2- this chapter will give basic idea about Nervous System : Kinds of neurons, synapse, Nerve impulse, all or none-principal, Structure an functions of human brain.

CO3- to understand the basic process of Perception : Nature and characteristics, Gestalt view. Role of personal and social factors in perception.

CO4- to impart knowledge about remembering & forgetting : Nature and process of

remembering, Nature and causes of forgetting.

CO6- Student will be able to understand the concept of Thinking : Nature and

process, Thinking and Imagining, creative Thinking.

CO7-this chapter will give idea about the emotion : Nature, Bodily changes, JamesLange and Cannon-Bard theories.

CO8- student will be able to understand the concept of Motivation : Nature, Needs,

Drives and Incentive, Kinds of motives, Biogenic and sociogenic.

CO9- to understand the concept of Intelligence : Nature, measurement of intelligence,

uses of intelligence test.

CO10-to impart the concept of Personality : Nature, Types Determinants- Biogenic

and social.

B A 1st Year CO:

Paper No. 1.

Name of the Paper: General Psychology (Pass Course)

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CO1-To understand various method Methods, Objective observation. Advantages and

limitation.

CO2- This chapter will give basic idea about the Nervous System : Central and Autonomic, Structure and Function of human cortex, Methods of Studing brain function.

CO3-Student will be able to understand the process of Perception : Characteristics.

Role of personal and Social factors, laws of perceptual organization, perception of

space.

CO4- To introduce the concept of learning: Role of motivation in learning, Learning

curve - classical and Instrumental. Transfer of learning.

CO5-to understand the concepts of Remembering & Forgetting : Nature, Factors of

retention, Nature and causes of forgetting, Retroactive inhibition and determinants.

CO6- basic information of thinking: Thinking and related concepts, problem solving,

language and thought.

CO7- this chapter will give basic concept of emotion: Nature, Bodily changes in emotion, Role of Autonomic Nervous System and Hypothalamus. James Lange and

Cannon-Bard theories.

CO8- to understand the concept of Motivation : Motives and related concept - Need,

Drive and Incentives, Biogenic and Sociogenic motives.

CO9- This chapter will give basic idea about the Intelligence : Nature Measurement

of Intelligence; Uses of Intelligence tests :

CO10- To understand the concept of Personality : Nature, Types Traits, Determinants, Biogenic and Sociogenic.

PSYCHOLOGY (Hons.) Paper-III

B A 2nd Year CO:

Paper No. 3.

Name of the Paper: Research Methodology & Statistics

Group - A (Research Methodology)

CO 1: Know the Nature and stages of psychological researches, writing a research

report.

CO 2: importance of Research problems, variables, Hypothesis- Sources of hypothesis, criteria of a good hypothesis.

CO 3: Understand the Methods in psychological research: Case Studies. Quasiexperimental and experimental- Laboratory and Field experiments- Their advantages and limitations.

CO 4: Methods of data collection: Observation, Interview and Questionnaire their advantages and limitations.

CO 5: Importance of Sampling: Meaning, Random, Purposive and stratified sampling techniques- Their advantages and limitations.

Group - B (Statistics)

CO 1: Know about Frequency distribution. graphic representation-frequency polygon, histogram and ogive.

CO 2: Statistical use of Measures of central tendency and variability: Mean, mode, median, and Q. AD and S.D.

CO 3: Know the Concept of Normal Probability distribution and its applications, skewness and kurtosis.

CO 4: Importance of Reliability, difference between two means - Correlated and uncorelated means.

CO 5: Understand the concept of Correlation: Product-Moment and Rank difference methods.

PSYCHOLOGY (Hons.) Paper-IV

B A 2nd Year CO:

Paper No. 4.

Name of the Paper: Social Psychology

CO 1: Understand the concept of subject Matter and Scope: Relation of Social Psychology with Sociology and Anthropology.

CO 2: Understand the Methods use in Social Psychology: Observation, Experiment and Survey, Merits and limitations.

CO 3: Know the concept of Socialization: Process, Psychoanalytic, cultural and social learning approaches.

CO 4: Understand the concept of Attitude: Meaning and nature, formation of attitude, Changes, measurement of attitude-Likert and Thurstone scale.

CO 5: Understand the concept of Prejudice: Nature, Sociological and Psychological correlates of prejudice, Reduction of prejudices.

CO 6: Understand the concept of Group: Meaning, Kinds, Structure and functions of group, group formation.

CO 7: Importance of Leadership: Nature dimensions, emergence, types and functions of a leader.

CO 8: Know the concept of Public opinion and propaganda- Meaning of public opinion, formation, change measurement. Technique of propaganda.

CO 9: Understand the concept of Social Change: Meaning and factors leading to social change-economic development, modernization and social identity.

CO 10: Understand the concept of Social Tension: Kinds, Causes, reduction-National integration.

PSYCHOLOGY (General & Subsidiary) Paper-IV

B A 2nd Year CO:

Paper No. 3.

Name of the Paper: Abnormal Psychology

Abnormal Psychology

CO 1: Distinction between normal and abnormal, different views about abnormality.

CO 2: Topographical aspects of mind-nature and proofs of unconscious.

CO 3: Dynamic aspects of mind-Id. Ego & super ego.

CO 4: Psychosexual development.

CO 5: Psycho pathology of everyday life and mental mechanism-Repression, sublimation, projection and rationalization.

CO 6: Dreams: Mechanism and wishfulfilment theory of dreams.

CO 7: Difference between neuroses and psychoses, diseases-symptoms & etiology of

Hysteria, obsessive compulsive neurosis.

CO 8: Understand the concept of Psychoses: Symptoms and etiology of paranoia and

Manic depressive psychoses.

CO 9: Understand the concept of Mental Retardation: Clinical types and causes.

CO 10: Understand the concept of Psychotherapy: Meaning and aims of psychoanalysis.

PSYCHOLOGY (Hons.) Paper-V

B A 3rd Year CO:

Paper No. 5.

Name of the Paper: History of Psychology

Paper V- History of Psychology

CO 1: Describe influence of psychological studies, ,Reaction time Problem , individual differences.

CO 2: To Learn contribution of E.H.Weber, G.T.Fechner , & H.Helmholtz, development of experimental psychology

CO 3: To learn foundation of experimental psychology

CO 4: To classify and understand various schools related to functionalism.

CO 5: To apply and to understand various concepts of behavioral psychology

CO 6: To understand contributions of gestalt psychologists.

CO 7: Describe the contribution of psychoanalytic school.

CO 8: To analyze the contribution of neo-freudians.

CO 9: To display different approaches to the study of personality by describing various• Definitions of personality

CO 10: To understand & apply contribution of humanistic school.

PSYCHOLOGY (Hons.) Paper-VI

B A 3rd Year CO:

Paper No. 6.

Name of the Paper: Industrial and Educational Psychology

Group-A Industrial Psychology

CO 1: Define and understand industrial and organizational psychology briefly with

history and Theoretical studies, problems and space of Industrial psychology.

CO 2: To understand and apply Physical and Psychological environments at work, Illuminations Noise, and atmospheric conditions

CO 3: To classify and create difference between fatigue and monotony, learn causes

of fatigue and monotony, methods of reducing fatigue and monotony.

CO 4: To understand Concept, principles and contributions of Taylor and Gilbreths.

CO 5: To learn Causes and prevention of accident, Accident proneness.

CO 6: To Define and learn differences between vocation selection and guidance, Selection process- Interview, Psychological tests- their advantage and limitations.

Group-B (Educational Psychology)

CO 7: To learn definition, Problems, Methods, Scope and Aims of Educational Psychology.

CO 8: To learn measurement of intelligence, aptitude & achievement- technique and uses.

CO 9: Importance of Programmed learning formal and non formal education, role of motivation in learning, transfers of Training.

CO 10: Importance of Assessment of Academic Attainment

CO 11: To Learn importance of Education of special Types of Children, Gifted, physically handicapped and retarded.

CO 12: To apply study of adjustment problems of students including delinquency, truancy, learning disabilities and their measures.

PSYCHOLOGY (Hons.) Paper-VII

B A 3rd Year CO:

Paper No. 7.

Name of the Paper: Clinical and Developmental Psychology

Group - A (Clinical Psychology)

CO 1: To develop an ability to understand abnormal psychology in a broader perspective

CO 2: To analyze psychological models of abnormality, Methods of diagnosis-Case

study, Interview, Psychological tests.

CO 3: To understand and analyze various dimensions of personality and its method

of assessment.

CO 4: To describe effectively and to know various anxiety based disorders with proper, Therapeutic interventions

CO 5: To understand the role of clinical psychologists in different institution.

Group-B (Developmental Psychology)

CO 1: To develop an ability to understand developmental psychology in broader Perspectives with major concentration on stages of life span development

CO 2: To analyze biological beginnings and to understand mechanisms of heredity

CO 3: To appreciate the process of prenatal life with its stages of development by

Studying birth process and methods of delivery

CO 4: To describe various developmental perspectives in infancy period

CO 5: To analyze early and late childhood period by observing through various, Developments

CO 6: Critically analyze puberty and adolescence

CO 7: Describe early adulthood by analyzing physical, cognitive and psycho-social

Development

CO 8: Effectively analyze and describe physical, cognitive and psycho-social Development in middle adulthood

CO 9: Apply physical, cognitive and psychosocial development to late adulthood

DEPARTMENT OF PSYCHOLOGY

COURSE OUTCOME (POST GRADUATION)

P G First Year CO:

Paper No. 1.

Name of the Paper: Fundamental Psychology Process & Research Method

Group-A Fundamental Psychology Process

CO1 - student will learn basic concepts of Receptors, Effectors and Adjustor Mechanisms. Origin and conduction of Neural Impulses.

CO2 –in this chapter student will learn about the Motivation concept and Need hierarchy Model Alderfer Model.

CO3 – student will understand the concept of emotion with the help of various theories of Emotion Schachter - Singer Theory, Leeper's Emotion theory, CannonBazo Theory

CO 4- this chapter will be focused on various dimensions of Personality, and thought

school of personality like Maslaw and rogers, Cattels.

CO 5- Basic understanding about Intelligence and theories of Spearman and Guilford,

Thorndike

Group-B

Research Method

CO1- This chapter will give idea about ethical and unethical practices in research this

chapter includes Meaning and purposes of Research. Nature and Types of variables.

Ethical issues in Psychological research.

CO2 – what is the purpose of Sampling in Research, how sampling affect outcome,

all these questions will be answered in this chapter. Nature and characteristics of good

sampling, Non-probability sampling, Incidental and purposive.

CO3 – student will be able to understand about various research tool like- Survey Method, Field experiment method, observation

CO4 – Develop understanding about the Research Design Between group design Nature, Merits and Demerits Latin square design.

CO5 -Quasi- Experimental Design Meaning, Merits and Demerits, Types.

P G First Year CO:

Paper No. 2.

Name of the Paper: Cognitive Process & Social Psychology

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Group-A

Cognitive Process

CO1- this will give understanding about the Colour Vision Theories Young, Helmholtz Theory and Hering Theory

CO2- student will learn the concept of reinforcement, difference between positive

reinforcement and punishment and various Learning Theories like- Thorndike, Pavlov

and Skinner.

CO3- They will learn how to improve their Memory, and process of memory- S.T.M.,

L.T.M and Level of Processing Model.

CO4- it will help in understanding the process of Problem Solving they will also learn

method of problem solving - Random Search method and Heuristic search Method.

CO5- to understand the concept of Creativity and nature and Measurement of Creativity, Factors influencing creativity.

Group-B

Social Psychology

CO1- To understand the fundamentals of social psychology and the nature and history

of social Psychology, brief history of social Psychology, Meaning and Research trends in social Psychology, Nature and scope of social Psychology.

CO2- Student will learn basic about attitude and attitude formation in social Attitude

Theories - Rosenberg's and Festinger

CO3- it will help in understanding social processes Social Motivation - Meaning and

Types Social Power - Meaning and Types

CO4 – Student will learn the role of perception in society, and develop the understanding of Person - Perception - Nature and determinants Perceptual defense,

perceptual Accentuation

CO5- This will help in understanding the Social Phenomena Similarity theory, Complementarily Need theory of Interpersonal attraction, causes and Remedial measures of Domestic violence.

P G First Year CO:

Paper No. 3.

Name of the Paper: Cognitive Process & Social Psychology

Group-A

Neuro Psychology

CO1- Student will understand the basics of Cerebral Hemispheres Structure and

functions & cerebral cortex, specialisation of cerebral Hemispheres.

CO2- Basic concepts of the method of Investigation Radiological Method - Structural

imaging method Functional imaging Method

CO3- To understand the concepts of Lobular syndrome Frontal lobe syndrome - Disturbances in memory functions Temporal lobe syndrome - Disturbance in perception

CO4- After studying this chapter student will be able to understand the Hemispheric

Asymmetry of Function Structural Asymmetry, Functional Asymmetry

CO5-This chapter will give basic idea of Neuro Psychological Assessment Attention

and concentration, Learning and Memory

Group-B

Psychometrics

CO1- To understand the basic concepts of psychometrics Meaning and types of statistics, scope of statistics.

CO2- Normal Distribution curve Nature, Characteristics, Application of N.P.C.

CO3- Student will be able to understand the basic concepts of Correlation Method

Meaning and types of correlation, Calculation of r bis Biserial correlation.

CO4- to learn the basics of Parametric Statistics Concept, Merits and Demerits, Calculation of t-test (correlated means)

CO5-to learn the basics of Non-Parametric Statistics Concept, Merits and Demerits,

Application of Chi-Square test, Calculation of Chi-Square (2x3 Table)

P G First Year CO:

Paper No. 4.

Name of the Paper: Fundamental Psychology Process & Research Method

Group-A

Fundamental Psychological Process

CO1-To get the understanding of the biological mechanisms of Behaviour.
Nature &

Measurement, Neural Impulses, Endocrine glands.

CO2- to know the various model of motivation like- Vroom's vector - valence
model,

Opponent - Process model.

CO3-to understand the important theories of emotion, like- Lazarus theory &
Lindsley Theory

CO4- To understand the theoretical aspect of Personality and theories of
Erickson &

Bandura, Lewin

CO5- to give conceptual understanding about the Intelligence and the theories
of

Gardiner and Piaget, Thurstone

Group-B

Research Method

CO1- To understand the Experimentation in Psychology

Techniques of Experimental Manipulation, source of Biases, Types of
Psychological

research.

CO2-student will be able to know the role of Sampling Sources of error in
sampling

probability sampling- Random & stratified sampling.

CO3- To get understanding about the various Research Tool Field studies,
Laboratory

experiment method, Ex-Post facto research.

CO4-this chapter will give idea about the various Research Design Within Group Design - Meaning Merits & demerits, Factorial Design.

CO5-student will be able to understand the Non-Quasi experimental Design Meaning

& Purposes, Interrupted time series Design.

P G First Year CO:

Paper No. 5.

Name of the Paper: Cognitive Process & Social Psychology

Group-A

Cognitive Processes

CO1-Student will be able to understand the Audition Theories, Place theory, Frequency theory.

CO2- to know the various Learning theories like- Tolman, Guthrie, Gestalt theory

CO3- to understand the concept of Forgetting and the factors that affect the memory.

Anti- consolidation theory, Interference theory, Two factor theory.

CO4- to understand the basics of Problem Solving Role of set in thinking, Language

in thinking, peripheral theory of thinking.

CO5-Process of Decision Making and Major Heuristics in Decision Making, Biases

& errors in Decision making.

Group-B

Social Psychology

CO1- Student will understand the relationship of Social Psychology and relationship

between social Psychology & Sociology, Relationship between social psychology &

Anthropology, Growth of social psychology as modern science.

CO2- to understand the Social attitude and theories on attitude - Kats & Kelman

CO3- student will understand the basic Social Processes, Pro-Social Behaviour, Help

and Altruism, Aggression - Dollard and Milars theory.

CO4-to understand the basic of Attribution Nature & Principles, Theories - Kelley,

Jones & Devis.

CO5- student will get better understanding about the various Social Phenomena - Poverty, Problems of Social change, population issues.

P G First Year CO:

Paper No. 7.

Name of the Paper: Neuro Psychology & Psychometrics

Group-A

Neuro Psychology

CO1-Student will understand the Neuro Physiological bases of Behaviour. Learning,

Emotion & Motivation

CO2-In this chapter student will understand the method of Investigation Halstead,

Reitan Method, Luria-Nebraska Method

CO3-to understand the basic concepts of Lobular Syndrome Occipital lobe syndrome

- Disturbances in visual perception Parietal lobe syndrome - Labular syndrome &

Specified Symptoms

CO4- student will understand the various Cerebral Disorder Cerebro - vascular

Disorder, Intracranial tumours, Cerebral trauma.

CO5-there are various assessment tools, student will get idea about them. Neuro

Psychological Assessment T.A.T, R.T, M.M.P.I

Group-B

Psychometrics

CO1- Student will be able to understand the basics of Introduction level of Measurement, Population and Parameter.

CO2-to understand the Non-Normal Distribution nature and Types. Importance of

Non-normal Distribution curve.

CO3-To understand the basics of Correlation Method meaning, Assumption, Merits

& Demerits of point bi-serial correlation, Calculation vpbis point - serial correlation

method.

CO4-Student will be able to understand the Parametric Statistics assumption and

Application of one way ANOVA. Calculation of T-test (Independent means)

CO5- to understand the Non Parametric Statistics U-test, Median test configuring,

coefficient of correlation (C)

P G Second Year CO:

Paper No. 9.

Name of the Paper: Clinical Psychology

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Group-A (Psychopathology)

CO 1: Understand the Diagnostic Classification and Models : DSM-IV

Classification

CO 2: Understand the Approaches to clarify abnormal behaviour Difference between DSM-IV and DCM-III R.

CO 3: Know the concept of Anxiety Disorder : Phobia, Types and causes of Phobia Panic disorder - symptoms and causes of panic disorder

CO 4: Understand the concept of Somatoform & Dissociative Disorder - Nature and types of Psychosomatic, Cardiovascular disorder, Gastrointestine disorder, Respiratory disorder

CO 5: Understand the concept of Personality disorder, Clinical picture Personality

disorder Types of Personality disorder

Group-B (Cross-culture Psychology)

CO 1: Understand the concept of Meaning and nature of culture - Meaning and nature of cross-culture

CO 2: Know about Culture and cognition Mechanism of culture transmission Culture influences on perception and learning

CO 3: Understand the concept of Culture and organisation Work value Managerial techniques Organizational culture

CO 4: Understand the concept of Culture and Health Psychopathology a cross culture Organisation culture

CO 5: Understand the concept of Culture and social behaviour Social norms and conformity Gender role and socialization process.

Second Year CO:

Paper No. 10.

Name of the Paper: Special Clinical Psychology

Group-A (Clinical Intervention)

CO 1: Know the concept of Therapeutic Interventions: Types of therapeutic intervention Nature and goals of intervention Approaches to intervention

CO 2: Understand the concept of Therapeutic Relationship Character of therapist

Causes and treatment of Anxiety

CO 3: Understand the concept of Types of Therapy Psychoanalytic therapy Personcentred therapy

CO 4: Know the concept of Counselling Nature and goals of counselling Techniques

of counselling

CO 5: Understand the concept of Diagnostic Tools : T.T., Rt. & MMPI

Group-B (Intervention: In the large Perspective)

CO 1: Understand the concept of Intervention strategies: Short term and long term

intervention, Intervention design

CO 2: Know the concept of Clinical Problems Unemployment problem Child abuse,

woman abuse

CO 3: Understand the concept of Intervention Programme School mental Health Programme Teacher's Training Programme

CO 4: Know the concept of Toxic Problems: Drug abuse, Alcoholism

CO 5: Understand the remedial measures taken by Organisation Non-government

Organisation and Government Organisation

Second Year CO:

Paper No. 11.

Name of the Paper: Special Clinical Psychology

Group-A (Stress & Health)

CO 1: Understand the Nature and types of Stress Nature and Sources of Stress

CO 2: Know the concept of Stress and Health- Related Consequence Phobia &

Depression

CO 3: Understand the concept of Coping Strategies, Problem - focused and Emotion

Focused strategies

CO 4: Understand the concept of Support system, Family Support & Social Support

CO 5: Know the concept of Stress Resolutions, Time Management & Self Management

Group-B (Yoga Psychology)

CO 1: Understand the concept of Yoga : Concept and Meaning Relationship between

Yoga and Psychology Uses of Yoga Psychology

CO 2: Know the concept of Raj Yog (Bahirang Yog) Asan & Pranayam

CO 3: Understand the concept of Pran Vidya: Nature, Kinds and functions of Nadis

Nature, Kinds & functions & Pranic system

CO 4: Know the concept of Medication: Concept and methods of Meditation

Advantages of Meditations

CO 5: Understand the concept of Aspect of mind: Topographical & Dynamic aspect

of mind

Second Year CO:

Paper No. 13.

Name of the Paper: Psychopathology and Cross Culture

Group-A (Psychopathology)

CO 1: Understand the concept of Models of abnormal behaviour Cognitive Model,

Behaviouristic model.

CO 2: Know the concept of Unipolar Mood Disorder: Nature and types of mood disorder, Symptoms & Causes of Paranoia

CO 3: Understand the concept of Bipolar disorder: Nature and types of Bipolar disorder, Etiology of Bipolar disorder.

CO 4: Know the concept of Schizophrenia & Paranoia: Types of Schizophrenia, Symptoms & Causes of Paranoia

CO 5: Understand the concept of Cognitive Disorder: Problems & Rehabilitation of

Aged persons, Symptoms & Causes of Delirium

Group-B (Cross Cultural Psychology)

CO 1: Understand the concept of Culture and Cognition: Cultural influence on memory and problem solving behaviour

CO 2: Know the concept of Culture and Organization: Organizational Development

and Organizational Change

CO 3: Understand the concept of Culture and health: Cultural factors in Health Intervention. Adolescent's Health hazard socio-cultural, Factors of Abnormality.

Second Year CO:

Paper No. 14.

Name of the Paper: Special Clinical psychology

Group-A (Clinical Intervention)

CO 1: Know the concept of Therapeutic Role: role of therapists in mental hospital,

child Guidance Clinic, Education Institution

CO 2: Understand the concept of Types of Therapy: Behaviour Therapy, Family Therapy

CO 3: Know the concept of Methods of Clinical Psychology: Interview, Case Study

Method, Psychological Test.

Group-B (Intervention: In large perspective)

CO 1: Understand the concept of Clinical Problems: Primary Education, Juvenile Delinquency, Mental Retardation

CO 2: Know the concept of Intervention Programme: Programme for Girl's education, Programme for Adult Education, Rehabilitation programme of the Aged.

CO 3: Understand the concept of Specific Therapeutic measures: Drug Therapy, Shock Therapy.

Second Year CO:

Paper No. 15.

Name of the Paper: Special Clinical psychology

Group-A (Stress & Health)

CO 1: Understand the concept of Stress and Health related Consequences: behavioural

physical Symptoms, Burnout Stress Syndrome.

CO 2: Know the concept of Support System: peer support, supervisory support

CO 3: Know the concept of Stress Resolution: Yogic meditation, Budhists Vipasana.

Group-B (Yoga Psychology)

CO 1: Understand the concept of Yoga: Nature and Kinds of Yoga: Karm Yoga, Gyan

Yoga, Laya Yoga.

CO 2: Know the concept of Raj Yoga(Antaranag Yoga): Nature and Stages of Dharana, Nature and Kind of Dhyan.

CO 3: Understand the concept of Chakras & Psychosomatic disorders: Nature, Kinds

and Significance of Chakras, Nature and Causes of psychosomatics disorders

Department of psychology

Program Specific Outcome

Post Graduation

PSO 1: Understand the Diagnostic Classification and Models : DSM-IV Classification.

Understand the Approaches to clarify abnormal behavior Difference between DSM-IV and

DCM-III R, Know the concept of Anxiety Disorder: Phobia, Types and causes of Phobia and

other psycho social disorder.

PSO 2: Understand the concept of Meaning and nature of culture - Meaning and nature of

cross-culture, Know about Culture and cognition Mechanism of culture transmission,

Culture influences on perception and learning, Understand the concept of Culture and social

behavior Social norms .

PSO 3: Know the concept of Therapeutic Interventions: Types of therapeutic intervention

Nature and goals of intervention Approaches to intervention, understand the concept of

Therapeutic Relationship Character of therapist, Causes and treatment of Anxiety

PSO 5: Understand the Nature and types of Stress Nature and Sources of Stress, Know the

concept of Stress and Health- Related Consequence, Understand the concept of Coping

Strategies, Problem - focused and Emotion

PSO 6: Understand the concept of Yoga : Concept and Meaning Relationship between, Yoga

and Psychology Uses of Yoga Psychology

Program Specific Outcome (PSO) Undergraduation

According to syllabus developed under university guidelines, in the third term of graduation

the department of psychology offers three papers and one practical which could have

different outcomes.

PSO 1: This program enables students to learn the various schools of psychology, the older

techniques used by psychologists to develop insight of different behavioral paradigms. This

course aims to develop an understanding of the conceptual framework of psychology which

helps the students to acquire deep knowledge psychology in past.

PSO 2: Industrial psychology combines the principles of psychology with a methodical

investigation of various work settings. Often referred to as industrial-organizational

psychology, this discipline helps students to analyze numerous aspects of the working world

and the attitudes of individuals toward their respective careers. Whereas educational

psychology enable students to learn various methods of psychometric testing, data collection,

program development and research evaluation to advise staff and administration on the best

learning practices for their institution or organization.

PSO 3: This program aim to teach students to help people cope with stressful situations,

overcome addictions, improve their relationships with their husband, wife or parents, and

break through barriers that keep people from reaching their potential. They also learn

administering psychological tests to evaluate cognitive strengths and weaknesses, personality

characteristics, and more. In addition in developmental psychology students study how

people grow and adapt at different life stages.

PSO 4: Under this program our students practice experiments from different chapters of the

entire syllabus to develop thorough understanding of the subject. Undoubtedly practical

enhance the theoretical learning of any paper.

Programme

B. Sc. (Honours) Mathematics

Objective of the Programme:

The programme aims to

- Provide a broad and comprehensive knowledge of core areas of pure and applied mathematics

in a supportive teaching environment.

- Develop skill to manipulate the problems related to algebra, calculus, trigonometry etc.

- Develop logical thinking and expertise required in techniques for proving or disproving the

facts after mathematical formulation.

- Stimulate an interest in all aspects of modern mathematics.

- Prepare students for work as professional mathematicians either in academia or elsewhere.

- Develop an appreciation of the importance of mathematics research.

Programme Specific Outcomes (PSOs):

On successful completion of this programme the student will have knowledge and understanding

of:

☐ Core areas of pure mathematics including geometry, algebra, mathematical analysis.

☐ Core areas of applied mathematics including statics, dynamics and differential equations.

☐ Several specialised areas of advanced mathematics and its applications.

☐ the correct use of mathematical language to express both theoretical concepts and logical

argument.

Syllabus 3 4 5 6 7 8

Course Learning Outcomes (CLOs):

Paper-I

The course included in this paper will enable the students to:

- Learn different types of sets, relations and functions, notion of countable and uncountable sets.
- Learn operations on matrices and different types of matrices.
- Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix, using rank.

- Analyse and solve linear programming models of real life situations.
- Learn graphical solution of LPP with only two variables, and illustrate the concept of convex

set and extreme points. Learn the theory of the simplex method is developed.

- Learn elementary theorems on the roots of an equation, Polynomials, The remainder and factor

theorem, Synthetic division, Factored form of a polynomial, The Fundamental theorem of

algebra, Relations between the roots and the coefficients of polynomial equations.

- Employ De Moivre's theorem in a number of applications to solve numerical problems.

Paper-II

The course included in this paper will enable the students to:

- Sketch curves in a plane using its mathematical properties in the different coordinate systems of reference.

- Apply derivatives in finding equations of tangent and normal, radius of curvature, limits in indeterminate forms, etc.

- Compute area of surfaces of revolution and the volume of solids by integrating over crosssectional areas.
- Learn conics and their properties both in polar and Cartesian coordinate systems.
- Learn lines and planes in space, three dimensional geometric objects like sphere, cone, cylinder, etc. and their properties.

Paper-III

The course included in this paper will enable the students to:

- Understand many properties of the real line and learn to define sequence in terms of functions

from \mathbb{N} to a subset of \mathbb{R} .

- Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate

their limit superior, limit inferior, and the limit of a bounded sequence.

- Apply the ratio, root, alternating series and limit comparison tests for convergence and absolute

convergence of an infinite series of real numbers.

- Know the axioms for group, ring and field and recognise their examples.

- Know the definitions of basic terms, such as: order of a group, order of an element, subgroup,

cyclic group and homomorphism of groups, isomorphism, kernel, etc.

- Understand the proof, statement and simple uses of Lagrange's Theorem.

- Learn Cancellation laws in ring, zero divisors in a ring, integral domain, field, ring of residue

classes, ring of matrices, subrings, and homomorphism of rings.

- Understand the difference between finding a proof from the axioms that works for all groups,

and finding a counterexample.

Paper-IV

The course included in this paper will enable the students to:

- ☐ Learn vector and scalar products of three and four vectors.
- ☐ Compute the derivative of dot and cross products of two vectors.
- ☐ Learn the notion of scalar and vector fields (scalar and vector point functions), calculate line integrals along piecewise smooth paths; interpret such quantities as work done by a force.
- ☐ Compute the gradient of a scalar point function, curl and the divergence of vector point functions.
- ☐ Formulate Differential Equations for various Mathematical problems.
- ☐ Solve first order ODEs of degree one or more.
- ☐ Solve linear differential equations of higher order with constant coefficients.
- ☐ Understand the significance of mathematics involved in physical quantities and their uses; to study and to learn the cause-effect related to these; and the applications in observing and relating real situations/structures.

Paper-V

The course included in this paper will enable the students to learn:

- ☐ The conceptual variations when advancing in calculus from one variable to multivariable discussions.
- ☐ Applications of multivariable calculus tools in physics, economics, optimization, and understanding the architecture of curves and surfaces in plane and space etc.
- ☐ Some of the families and properties of Riemann integrable functions, and the applications of

the fundamental theorems of integration.

☐ Beta and Gamma functions and their properties.

☐ The valid situations for the inter-changeability of differentiability and integrability with infinite

sum, and approximation of transcendental functions in terms of power series.

Paper-VI

The course included in this paper will enable the students to learn about:

☐ Automorphisms for constructing new groups from the given group.

☐ External direct product of two groups ($Z_2 \times Z_2$ applies to data security and electric circuits).

☐ Sylow theorems and their applications to check nonsimplicity of groups.

☐ The fundamental concept of Rings, Fields, subrings, integral domains, imbedding of a ring and

integral domain in a field, prime and maximal ideals in a commutative ring.

☐ The concept of linear independence of vectors over a field, the idea of a finite dimensional

vector space, basis of a vector space and the dimension of a vector space.

☐ Basic concepts of linear transformations, the Rank-Nullity Theorem, matrix of a linear

transformation, algebra of transformations and the change of basis.

☐ Dual space, eigenvalues and eigenvectors, Cayley-Hamilton theorem.

Paper-VII

The course included in this paper will enable the students to:

☐ Compute moment of inertia.

☐ Learn Parallel and Perpendicular axes theorems.

☐ Determine Principal Axes of Inertia

☐ Understand fundamentals of Mechanics of Rigid Bodies.

☐ Compute attraction and potential of various objects by virtue of Laplace and Poisson equations.

☐ Learn theorems on equipotential surfaces.

☐ Compute hydrostatic pressure at a point.

☐ Understand equilibrium of fluids under a system of forces.

☐ Understand equilibrium of floating bodies.

☐ Apply the fundamental concepts of Ordinary Differential Equations and Partial Differential Equations.

☐ Learn basic methods (including the method of variation of parameters) for the solution of

second order differential equations with variable coefficients, Total differential equations,

simultaneous differential equations, linear and nonlinear pde's (Lagrange and Charpit's methods).

Paper-VIII (Spherical Astronomy) (Optional)

The course included in this paper will enable the students to:

☐ Describe the scientific method, and explain how it is applied to the study of the universe

☐ Learn basic concepts on spherical triangle, viz. sine rule, cosine rule, Napier's and D'

Alembert's angles, right angled triangle and Napier's rule.

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☐ Identify major stars, constellations, and commonly used coordinate systems for viewing the sky

☐ Explain the cycles of the sky (Earth, Moon, and Sun system) including: seasons, eclipses, tides,

phases of the Moon, and precession.

☐ State Kepler's Three Laws, Newton's Three Laws and Newton's universal law of gravitation

and demonstrate understanding of these laws through the solution of problems.

☐ Discuss the characteristics of the various bodies in the solar system

☐ Identify prominent features of the Sun including: sunspots, the solar cycle, solar flares, and

coronal mass ejections

☐ Explain how the spectrum from a star can be used to determine characteristics of the star such

as: temperature, composition, size, radial velocity, and rotational speed

☐ Discuss and explain different methods used to determine distances to stars and galaxies

including: stellar parallax, spectroscopic parallax, and standard candles.

☐ Explain how stars are formed, the role of fusion in energy production, and the evolution of

stars as they age.

Paper-VIII (Numerical Analysis) (Optional)

The course included in this paper will enable the students to learn about:

☐ Significant figures and errors of computation.

☐ Some numerical methods to find the zeroes of nonlinear functions of a single variable and

solution of a system of linear equations, up to a certain given level of precision.

☐ Interpolation techniques to compute the values for a tabulated function at points not in the

table.

☐ Applications of numerical differentiation and integration to convert differential equations into

difference equations for numerical solutions.

DEPARTMENT OF GEOGRAPHY

MA SEMESTER I

COURSE OUTCOME

Paper 1: History of Geographical Thought

CO 1: At the end of unit the student will be able to understand the importance of the study of

nature of geography.

CO 2: Understanding the contribution of modern geographers.

CO 3: Explain Development of Quantitative, Behavioural, Applied and Radical Geography.

CO 4: Concept of Region, Use and Classification of Models, System Analysis, Trend of

Modern Geography in India

CO 5: Development of Physical, Settlement and Political Geography in Ancient India, Future

of Geography

Paper 2: Physical Landscape

CO 1: Understanding Isostasy and its Applications, Plate Tectonics, Seafloor Spreading,

Earthquake-Causes and Effects

CO 2: Study of the Concept of evolution of landforms with special reference to W.M.Davis,

W. Penck, L.C. King and Hack

CO 3: Explain the Arid, Karst, Glacial and Periglacial cycles

CO 4: Erosion Surfaces, Terrain Evaluation, Geomorphic Evolution of Peninsular India and

Chhotanagpur Highlands

CO 5: Role of Applied Geomorphology in studying geography, Morphology of Relief

Features, Morphogenetic regions, Fluvial Geomorphology of North Bihar Plains

Paper 3: Climatology and Oceanography

CO 1: Understanding Nature and Scope of Climatology, Applied Climatology, Classification

of Climate: Schemes of Koppen and Thornthwaite

CO 2: To study Air Masses: Classification and Characteristics, Atmospheric Disturbances,

Evidences and Causes of Climate Change, Weather Forecasting.

CO 3: Examining Ocean topography: Bottom Configuration of Indian and Atlantic Oceans,

Submarine Canyons, Theories of Origin of Tides

CO 4: Theories of Origin of Coral Reefs, Marine Deposits, Food and Mineral Resources of

Oceans, Salinity of Ocean Water

CO 5: To know the concepts of Global Warming, Green House Effect, Hydrological Cycle,

Marine Farming

Paper 4: Practical

CO 1: Understanding the Construction and Interpretation of Rainfall Dispersion Diagram,

Ergograph, Spherical Diagram and Proportionate Circles

CO 2: Measuring Correlation and Regression Analysis

CO 3: Construction and Interpretation of Choropleth and Isopleth, Scatter Diagram,

Regression Residual Mapping

MA SEMESTER II

COURSE OUTCOME

Paper 5: Regional Geography of India

CO 1: A brief account on Structural, Physiographic and Agro-Climatic Regions, Attempts of

Dividing India into Natural Regions

CO 2: Study of Extra Peninsular and Peninsular, India's Macro Regions under the following

heads-Relief and Agriculture

CO 3: Detailed study of Meso Regions: Middle Ganga Plain, Punjab Plain, Malabar Coast

and Deccan Trap

CO 4: To understand Special Area Planning

CO 5: Study of Bihar under the following heads: Physiography, Flood Hazard, Agricultural

Regions and Industrial Regions

Paper 6: Economic Geography

CO 1: Meaning and Scope of Economic Geography, Relation of Economic Geography with

Resource Geography, Physical and Economic factors of Location of Economic Activities

CO 2: Concept and Techniques of Delimitation of Agricultural Regions, Crop Combination

and Diversification, Von Thunen's Model and its Modifications, Impact of Green Revolution on Indian Agriculture

CO 3: Explain the Theories of Industrial Location: Weber and Losch, Case Study of Selected

Industries, Iron and Steel and Cotton Textile

CO 4: Discussion on Development Regions of India, Globalisation and Indian Economy,

Impact of Globalisation on Environment, Role of Market in Development of Trade

and Commerce

CO 5: Typology of Market, Market Network in Rural Society, Market System in Urban

Economy, Mode of Transportation

Paper 7: Population Geography

CO 1: Meaning and Scope of Population Geography, Sources of population Data, Development of Population Geography in India

CO 2: Distribution and Growth of World Population, Demographic Transition Theory and

Optimum Population Theory

CO 3: Population Composition in India, Age & Sex Structure, Urbanisation, Occupational

Structure, Literacy

CO 4: Measurements and Determinants of Fertility and Mortality, Migration: Types of

Migration, International Migration

CO 5: Population Resource Regions in the World, Population Policies in Developed and

Developing Countries, India's Population Policies.

Paper 8: Practical

CO 1: Geological Maps: Construction of Sections and Interpretation

CO 2: Map Projection: Construction and Use of Mercator's, Sinusoidal, Mollweide's and

International Projection

CO 3: Topographical Analysis: Superimposed, Projected and Composite Profiles, Slope

Analysis: Smith's and Wentworth's Method

MA SEMESTER III

COURSE OUTCOME

Paper 9: Regional Planning

CO 1: Understanding the concept of Space and Location Attributes, Types of Regions Formal and Functional, Uniform and Nodal

CO 2: To Identify Special Purpose Regions-River Valley Regions, Metropolitan Regions,

Problem Regions, Hill and Tribal regions

CO 3: Discussion on Planning Process- Sectoral, Temporal and Spatial Dimensions, Short

Term and Long Term Perspectives of Planning, Measuring levels of Regional

Development and Disparities in Indian Context

CO 4: Regional Development Strategies- Concentration vs. Dispersal, Regional Development of India-Problems and Prospects, Planning Regions of India, Concept of

Multi Level Planning

CO 5: To study Role of Panchayati Raj System in Regional Planning, Role of Panchayati Raj

Institutions-Panchayat Samiti, Zila Parishad, Administrative structure (Village, Block,

District)

Paper 10: Settlement Geography

CO 1: Meaning and Scope of Settlement Geography, History of Settlement Geography in

India, Evolution and Growth of Human Settlement, Theories of evolution of Human

Settlements

CO 2: Discuss the Types of Rural Settlements, Classification of Urban Settlements- Location

and Functional Urban Centres

CO 3: Describe Internal Structure and External Form of Settlement, Internal Morphological

Structure of Cities, Patterns of Rural Settlements, Environmental, Socio-Economic

and Cultural Factors Influencing the Dynamics of Settlements Structure, Rural House Types and Building Materials

CO 4: Settlement Hierarchy- Theories of Christaller and Losch, Factors Contributing To

Hierarchy, Measurements of Centrality and Hierarchy of Settlements in India

CO 5: Types of House in Middle Ganga, Lower Ganga Plains, Chhotanagpur Highland,

Morphological Zones of Urban Centres

Paper 11: Fundamentals of Urban Geography and Regional Planning

CO 1: Definition and Scope of Urban Geography, Approaches of Urban Geography, Trends

of Urban Geography, Contribution of Indian Scholars to Urban Geography

CO 2: Site and Situation Components, Sector Theory, Multi Nuclei Theory and Concentric

Zone Theory of Internal Structure of Urban Centre, Rank Size Rule of City

Distribution

CO 3: Urban Morphology, Morphological Zones, Urban Land Use Classification, Contemporary Pattern of Urbanisation in the World

CO 4: Basic and Non-basic function of Urban Centres, Functional Classification of Urban

Centres, Christaller's Central Place Theory, Urban Hierarchy

CO 5: Rural-Urban Fringe, City Region, Metropolitan Region, Megalopolitan Region

Paper 12: Practical

CO 1: Identification and Construction of Salient Landform Features of the Selected Area on

a Topographical Sheet, Preparation of Transect Diagram

CO 2: Exercise and Use of Plane Table, Dumpy Level and Theodolite in Triangulation

Survey

CO 3: Analysis of the Impact of Physical Determinants on the Cultural Landscape of an Area

of Topographical Sheet

MA SEMESTER IV

COURSE OUTCOME

Paper 13: Environmental Geography

CO 1: Meaning and Scope of Environmental Geography, Concept of Ecology, Biotic

Community, Food Chain

CO 2: Concept of Eco-system, Terrestrial, Marine and Mountain Ecosystem, Major EcoSystems of India.

CO 3: Environmental Degradation, Problems and Types of Pollution-Air and Water,

Depletion of Ozone Layer

CO 4: Reasons of occurrence of Environmental Hazards and their Management in India

CO 5: Environmental Management and Policies in India, Conservation and Management in

Coastal and Mining Areas

Paper 14: Quantitative Geography

CO 1: Meaning and Scope of Quantitative Geography, Quantitative Revolution in Geography

CO 2: Methods of Data Collection and Classification, Questionnaire and Schedules,

Sampling: Procedures and Types of Sampling, Testing the Adequacy of Samples.

CO 3: Needs and Types of Hypothesis, Parametric and Non-Parametric Procedure, ChiSquare test, ANOVA

CO 4: Bivariate Analysis, Simple Linear Regression Analysis, Spearman's Rank Correlation,

Product Moment Method

CO 5: Gravity-potential Model- Spatial Interpolation and Trend Surface Analysis, Spatial

Diffusion, Nearest Neighbour Analysis, Markov Chain Model

Paper 15: Urban and Regional Planning

CO 1: Regional Disparities, Need of Urban and Regional Planning, History of Urban and

Regional Planning in India, Role of Geographers in Urban and Regional Planning

CO 2: Problems of Urbanization in India and Bihar, Regional Variations in level of Urbanization in India and Bihar

CO 3: Concept and Principles of Urban and Regional Planning, Urban and Regional Survey,

Mechanism of Plan Formulation, Techniques of Urban and Regional Planning

CO 4: Planning Regions of India, Urban Regions of India, Urban Regions of Bihar, Administrative Context of Urban and Regional Planning

CO 5: The New Town Movement, Neighbourhood Planning, Growth Pole and Growth

Channel Concept

DEPARTMENT OF GEOGRAPHY

COURSE OUTCOME

T.D.C. Part I (Hons.)

Paper I: Physical Geography

CO 1: Understanding theories of Origin of Earth, the fundamental concepts such as Wegner's

Continental Drift, Plate Tectonics, Mountain Building, Normal Cycle of Origin, Peneplain, Rejuvenation, contribution of W.M. Davis and Walter Penck.

CO 2: To examine the role of agents of erosion (wind, glacial, groundwater, sea waves) in

transforming the earth's surface and topography resulting from them.

CO 3: Acquire knowledge in understanding the mechanism of formation of air masses and

fronts and their classification, scheme of climatic classification given by Koppen and

Thornthwaite, evidence of Climatic Changes.

CO 4: To study the concept of Salinity of Ocean Water, reliefs of Indian and Atlantic Ocean

Floor, Ocean Deposits, Coral Reefs.

Paper II: Asia: A Regional Study

CO 1: Asia- Structure, and Physiography, Climate, Natural Vegetation and Soil, Minerals,

Power Resources, Coal, Petroleum, Hydro-Power and Population.

CO 2: China- Physical Regions, Agriculture, Minerals, Industrial Development and Population.

CO 3: Japan- Agriculture and Fisheries, Industrial Development, Industrial Regions,

Population.

CO 4: To study geographical account of Nepal, Bangladesh, Pakistan, Sri Lanka and

Myanmar.

CO: Practical

CO 1: Enlargement and Reduction of Maps, Compound Bar Diagram, Divided Rectangles,

Band Graph, Proportionate Circles.

CO 2: Interpretation of Weather Maps and Topographical Maps.

CO 3: Map Projection, Cylindrical Equidistant and Equal Area Projection, Simple Conical

Projection with one and two standard parallels, Polar Zenithal Equidistant and Equal

Area Projection.

COURSE OUTCOME

T.D.C. Part II (Hons.)

Paper III - India and Bihar

CO 1: To study structure, physiography, climate, origin and mechanism of Indian monsoon, natural vegetation.

CO 2: A brief account on Irrigation, Characteristics of Indian Agriculture, Crops, Agricultural Problems.

CO 3: History of Industrial development, power resources, factors for localization of

industries. Study of the following industries-iron and steel, cotton textile, sugar, cement and fertilizer

CO 4: To understand growth and distribution of population, problems of urbanization.

CO 5: A detailed study of Bihar-structure and relief, Agricultural regions, minerals (coal,

iron ore, bauxite, mica), industrial regions of Bihar.

Paper IV: Economic and Resource Geography

CO 1: Understanding major agricultural regions of the world.

CO 2: Getting familiarized with factors for location of industries, Weber's Theory of

Industries, Industrial Regions of the World.

CO 3: Distribution, Production and International Trade in Wheat, Cotton, Tea and Coffee,

North Atlantic Trade route, Suez Canal, Panama Canals.

CO 4: Concept of resources, major soil groups of the world, problems of soil erosion and its

conservation, forest as a resource, utilization and conservation of temperate and

tropical forest, major commercial fisheries of the world.

CO 5: Examine mineral resources-iron ore, bauxite, manganese, copper, power resources coal,

petroleum.

CO: Practical

CO 1: Cartograms, Climograph, Hythergraph, Windrose, Isopleth and Choropleth, Age and

Sex Pyramid.

CO 2: Projections-Bonne's, Polyconic, Sinusoidal and Mercator's.

CO 3: Statistics, Mean, Median, Mode, Quartiles and Standard Deviation.

COURSE OUTCOME

T.D.C. Part III (Hons.)

Paper V: Geographical Thought and three Southern Countries

CO 1: Definition of geography and its relation with other sciences, contribution of

Humboldt, Ritter, Ratzel, Vidal De Lablache.

CO 2: Dualism in Geography- Determinism V/S Possibilism, Neodeterminism, Physical V/S

Human, Systematic V/S Regional, Quantitative Revolution in Geography.

CO 3: Africa- Structure, Physiography, Climate, Vegetation, Geographical Account of Nile

Basin and South Africa.

CO 4: South America- Structure, Physiography, Climate, Vegetation, Geographical Account

of Coffee region of Brazil and Pampa.

CO 5: Australia- Structure, Physiography, Climate, Vegetation, Geographical Account of

Murray Darling basin and New South Wales.

Paper VI: Human Geography

CO 1: Examining environmental control on human activities in mountain, desert, equatorial,

monsoon and temperate grassland environments.

CO 2: Trends and patterns of population distribution and growth, demographic transition,

optimum population, factor of population mobility.

CO 3: Evolution and classification of human races, major cultural regions of the world.

CO 4: House types in India, rural settlement types and patterns, rural urban migrationcauses

and effects with particular reference to India.

CO 5: Trends of urbanization in India, locational and functional classification of towns,

rural-urban continuum, problems of urbanization with special reference to India,

morphology of Indian cities.

Paper VII: Geology of India

CO 1: Definition and Scope of Geography, Standard Stratigraphic Scale, Principles of

Correlation, Chronological History of Indian Stratigraphy.

CO 2: Classification, Mode of Occurrence and Distribution of Iron Ore, Copper, Bauxite,

Manganese, Coal and Petroleum.

CO 3: Petrological Characteristics, Classification, Distribution and Economic Importance of

Dharwar, Vindhyan, Lower Gondwana and Tertiary Systems of India.

CO 4: Classification of Rocks, Igneous, Sedimentary & Metamorphic Rocks, Metamorphism.

CO 5: Geological Evolution of the Himalayas, Chhotanagpur Plateau, Rajmahal Highlands,

Deccan Lava and Aravalli Mountains.

Paper VIII: Practical

CO 1: Surveying- Plan Table Survey, Resection and Inter Section, Open and Closed Traverse

with Prismatic Compass and Levelling, Theodolite and Clinometric.

CO 2: Geological Section and Interpretation of Geological Sheets

CO 3: Identification of rocks and minerals

DEPARTMENT OF GEOGRAPHY

MA (PROGRAMME OUTCOME)

At the end of the programme, students may understand the following concepts:

PO 1: Study the significance of History of Geographical Thought

PO 2: Understand the concept of Physical Landscape

PO 3: Explanation on the concept of Climatology and Oceanography

PO 4: Practical understanding of geographical concepts

PO 5: A detailed knowledge on Regional Geography of India

PO 6: Definition and application of Economic Geography

PO 7: Population Geography- Distribution and Growth of World Population, Measurements

and Determinants of Fertility, Mortality and Migration

PO 8: Regional Planning

PO 9: Settlement Geography

PO 10: Define and explain the Fundamentals of Urban Geography and Regional Planning

like Regional Disparities, Problems of Urbanization, Techniques of Urban and Regional Planning etc.

PO 11: A study on importance of Environmental Geography, Environmental Degradation,

Problems and Types of Pollution, Environmental Hazards and Management

PO 12: Introduction and explanation of Quantitative Geography

PO 13: Understand the concepts of basics of Urban and Regional Planning

DEPARTMENT OF GEOGRAPHY

(PROGRAMME OUTCOME OF BA)

By end of this unit the students will understand following topics:

PO 1: Understanding the fundamental concepts of Geomorphology, Climatology and

Oceanography.

PO 2: About regional study of Asia, Africa, South America and Australia.

PO 3: Contribution of various scholars in geographical study, Humboldt, Ritter, Ratzel,

Vidal De Lablache.

PO 4: Learn practical understanding of the subject related to presenting geographical data

through various diagrams.

PO 5: To know map projections.

PO 6: Statistical methods, mean, median, mode, Quartiles and Standard Deviation.

PO 7: Extending the knowledge of Topographical and weather maps. Surveying and

geological section.

PO 8: Geology of India, classification and identify different types of rocks and minerals.