BNYS 1st A

Duration : 6 months

SUBJECT TITLE: PHYSICS
SUBJECT CODE: PBNYS - T101

Total Number of Hrs.: 80 hours		Theory: 80 hours		Practical: --
Credits : 6		6		
Hrs./Week : 6 hours/week		6		
SCHEME OF EXAMINATION				
TOTAL MARKS: 100				
Theory: 100				Practical: --
Final Theory Exam	Internal Assessment	Viva Voce	Final Practical Exam	Internal Assessment
70	20	10	--	--

Goals:

The goal of introducing physics to students is to make them understand the scientific terms of measurements of physical quantities and to orient them towards the application of physics knowledge in solving physical equations.

Course Objectives:

- Physical quantities, derived units and their measurement units in S.I, C.G.S and MKS units.
- Basic concepts of speed, laws of motions, vectors, forces, Newton's law of gravity etc.
- Mechanism involved in fluid dynamics & thermodynamics.
- Principles of sound, waves, light, electrostatics.

Course Outcomes (Cos) :

At the end of the course, student should be able to:

- **CO 1 -** Make use of units & dimensions to measure physical quantities.
- **CO 2 -** Analyze & interpret mechanism involved in work, power, speed, velocity & acceleration.
- **CO 3 -** Demonstrate the skills of developing the capacitors, thermostats by using the knowledge of electrostatics.

THEORY:

Unit I: Introduction to Physics (Units & Dimensions). 3hours

(Only Definition & brief information)

1. Definitions of units (SI, CGS, MKS)
2. Derived units
3. Definitions of Dimensions
4. Physical quantities and uses of Dimensions
5. General terms used in the physics: velocity, acceleration, work, power, pressure, frequency, capacitance, energy, temperature, displacement, force, electric Charge, magnetic Flux, luminous Flux, electrical resistance.

Unit II: Dynamics **12hours**

1. Concept of Particle, motion of particle. (Definition &brief explanation)
2. Definitions of speed, uniform and variable velocity, acceleration, centrifugal & centripetal forces. (Definition &brief explanation)
3. Law of conservation of momentum and its illustrations (Statement &brief explanation)
4. Concept of Friction. (Definition &brief explanation)
5. Uniform circular motion. (Definition &brief explanation)
6. Centrifugal & centripetal forces, illustrations. (Definition &brief explanation)
7. Newton's law of gravitation. (Statement, examples &brief explanation)
8. Acceleration due to gravity. (Brief explanation)
9. Elasticity – Stress, Stain, Modulus of elasticity. (Definition &brief explanation)
10. Work, power, energy, kinetic &potential energy. (Definition)

Unit III: Fluid Dynamics & Mechanics **8hours**

1. Fluid thrust & pressure. (Definition, examples &brief introduction)
2. Atmospheric pressure. (Definition, examples &brief introduction)
3. Pascal's law. (Statement, examples &brief introduction)
4. Archimedes principle. (Statement, examples &brief introduction)
5. Floatation. (Statement, examples &brief introduction)
6. Osmosis, diffusion, convection. (Definition, examples &brief introduction)
7. Streamline flow. (Definition, examples &brief introduction)
8. Turbulent flow. (Definition, examples &brief introduction)
9. Bernoulli's Theorem & its applications. (Statement, examples &brief introduction)

Unit IV: Surface Tension & Viscosity **5 hours**

1. Surface energy, surface tension. (Definition, examples &brief introduction)
2. Viscosity. (Definition, examples &brief introduction)
3. Cohesion &adhesion. (Definition, examples &brief introduction)
4. Cohesive &adhesive forces. (Definition, examples &brief introduction)
5. Angle of contact. (Definition, examples &brief introduction)
6. Capillarity, capillary action. (Definition, examples &brief introduction)
7. Brief introduction on medical gases- storage and central pipeline system.

Unit V: Heat & Temperature **12 Hours**

1. Heat &temperature. (Definition, examples &brief introduction)
2. Thermometer principle, its types &uses.
3. Expansion of gases &gas Laws. (Statement, examples &brief introduction)
4. Isothermal & adiabatic processes. (Definition, examples &brief introduction)
5. Mode of heat transfer. (Brief explanation)
6. Conduction of heat. (Brief explanation)
7. Thermal conductivity & Applications.

Unit VI: Geometrical Optics **12 Hours**

1. Composition & Properties of light. (Brief introduction)
2. Rectilinear propagation. (Brief Introduction)
3. Mirror & its types. (Definition, examples &brief explanation
4. Laws of Reflection. (Statement, examples &brief introduction)
5. Laws of Refraction. (Statement, examples &brief introduction)
6. Refractive index. (Brief explanation)
7. Critical angle & total internal reflection, fiber optics. (Definition, examples &brief explanation)
8. Lens, types &uses. (Definition, examples & brief explanation)
9. Image formation. (Brief explanation)
10. Real & virtual image. (Brief explanation)
11. Refraction through lens. (Brief explanation)
12. Dispersion. (Brief explanation)
13. Beer & Lamberts Law. (Statement)
14. Colorimeter & Spectrophotometer. (Brief Introduction &applications)
15. Auto-refractometer & lasers (only Brief introduction)
16. Interference of Light. (Brief explanation)
17. Introduction to microscope.

Unit VII: Waves & Sound **6 Hours**

1. Oscillations, Periodic motion. (Definition, explanation)
2. Simple harmonic motion (Definition, types& characteristics)
3. Period, frequency, amplitude. (Only Definitions)
4. Waves & its classification. (Definition, explanation)
5. Longitudinal & transverse wave formation with examples. (Definition, explanation)
6. Origin & properties of sound. (Definition, explanation)
7. Ultrasonography. (Principle, working & applications: in Brief)

Unit VIII: Electrostatics &Current Electricity **10 Hours**

1. Electrostatics, Charge. (Definition)
2. Coulomb's law. (Statement)
3. Electric intensity, potential, field. (Definition)
4. Capacitor- capacitors in series and parallel. (Definition, explanation)
5. Current. (Definition)
6. Potential difference. (Definition)
7. Ohm's law. (Statement)
8. Resistors connected in series and parallel. (Definition, explanation)
9. Voltmeter, ammeter. (Brief introduction, uses)
10. Thermistors & uses. (Brief introduction, uses)

Unit IX: Modern Physics **12 Hours**

1. Introduction to Atomic physics. (Electron, nucleus, proton, neutron etc) (Only Definitions)
2. Cathode rays, properties and uses. (Definition, explanation)
3. Photocell, Uses & types. (Definition, explanation, uses)
4. Radioactivity. (Definition, explanation with types and uses)
5. Alpha, beta, gamma Rays & X-rays. (Definition, Explanation, properties, uses)
6. NMR, CT. (Brief Introduction)
7. Radioactive Safety measures & Symbols. (Only basic symbols)
8. Conductors, semiconductors & Insulators. (Definitions &examples)
9. P- Type, N- Type semiconductor, PN junction diode, Forward & reverse bias. (Definition, explanation)

SUBJECT TITLE: CHEMISTRY

SUBJECT CODE: PBNYS-T102

Total Number of Hrs.: 100 hours		Theory: 90 hours		Practical: -
Credits: 6		6		
Hrs./Week: 6 hours/week				
SCHEME OF EXAMINATION				
TOTAL MARKS: 100				
Theory: 100				Practical: --
Final Theory Exam	Internal Assessment	Viva Voce	Final Practical Exam	Internal Assessment
70	20	10	--	--

Goals:

The goal of introducing Chemistry to students is to make them understand about atoms, elements, molecules, compounds and their bonding, reactivity to attain stability.

Course Objectives:

- Some basic concepts of chemistry, structure of atom and its sub- atomic particles
- Theories of chemical bonding, chemical reactions and equilibrium.
- Principles and techniques in Organic chemistry, IUPAC NOMENCLATURE.
- Process of extraction and isolation of elements and minerals from the ores.
- General characteristics of state of matter.

Course Outcomes (Cos) :

At the end of the course student should be able to:

- **CO 1 -** Make use of indicators to Identify acids, bases and salts.
- **CO 2 -** Application of radioactivity in X-rays for clinical purpose
- **CO 3 -** Preparation of hydrocarbons, hydrogen peroxide, caustic soda and their uses in day-to-day life.
- **CO 4 -** Balancing the chemical reaction by application of properties of elements and its periodicity.

THEORY - 100 HRS

1. Some Basic concepts of Chemistry 2 Hours

Importance of chemistry. Nature of matter, properties of matter & their measurement. Laws of chemical combinations Dalton's Atomic Theory. Names of important elements and their symbol valency, writing the formula of certain compounds, SI units, drawing the relation between SI and non SI units, Atomic & molecular masses, percentage composition. Writing the dimension for physical quantities like volume pressure force area viscosity surface tension

2. Structure of an atom: 3Hours

Sub- atomic particles, atomic models, Bohr's model for Hydrogen atom. Atomic weight, Molecular weight, Equivalent weight of an element – definition, determination of equivalent weight of magnesium by hydrogen displacement method and copper by oxide method.

3. Acids, bases and salts. **3Hours**

Examples for each type. Indicators mentioning the colour change at the end point. Acidity, Basicity, equivalent mass calculation, oxidizing and reducing agent examples: Normality, molarity, Molality, PPM, volumetric analysis, V1N1 = V2N2 – problems

4. Hydrogen peroxide – Preparation properties and uses. **1Hour**

5.Sulphuric acid- Properties and uses. **1Hour**

6. Nitric acid- Manufacture, properties and uses. **2Hours**

7. Halogens: **2Hours**

Comparative study of preparation, properties and uses. Fluorocarbons and their applications**.**

8. Co-ordination compounds. **2Hours**

Examples and applications of co-ordination compounds in biological reactions**.**

9. Radioactivity **3Hours**

Natural radioactivity – properties of alpha, beta and gamma particles. Half-life period, Isotopes –applications

10. Caustic soda manufacture, properties and uses. **3Hours**

Sodium carbonate (washing soda) preparation, properties and uses.

11. Calcium compounds including plaster of Paris& Uses. **1Hour**

12. X-Rays production and its applications. **1Hour**

13. Colloids **4Hours**

Differences between colloids and crystalloids. Classification of colloids –methods of preparation of sols, dialysis-Tyndall effect and Brownian movement – applications of colloids in medicine food. Cottrell's electrical precipitator. Role of sodium, potassium, calcium chloride, bicarbonate ions in the fluid.

14. Electro chemistry **5Hours**

Electrolytes and non-electrolytes, example for each. Lowry and Bronsted concept of acids and bases. Hydrogen ion concentration, meaning of pH & pOH. pH values of biological fluids and their importance. Buffer solutions-definition, different types of buffers and examples for each. Henderson's equation determination of pH by buffer solution method. Importance of buffer in medicine

15. Classification of elements and periodicity in properties. **6Hours**

Development of periodic table. Modern and long form periodic table. Periodic trends in atomic radii, Ionic radii, Ionization energy, electron gain, enthalpy, electro negativity, valency & Hydrogen bonding. Anomalous properties of water.

16. Hydrocarbons **3Hours**

Saturated and unsaturated: Alkanes –methane, ethane –preparation, properties and uses. Alkenes –ethene-preparation, properties and uses. Alkynes-acetylene-preparation, properties and uses.

17. Ethyl alcohol **2Hours**

Manufacture from molasses- properties and uses. Preparation of bleaching powder, Iodoform, Chloroform, Benzyl alcohol, two chemical properties and uses.

18. Phenol **2Hours**

Manufacture from coal tar – properties, anisole, salol, cresols.

19. Aldehydes **2Hours**

Formaldehyde, acetaldehyde, benzaldehyde-preparation, properties and uses.

20. Acetone **1Hour**

Preparation& three important properties and uses.

21. Properties of carboxylic acids. Acids strength on the basis of pKa values.**1Hour**

22.Diethyl ether **2Hours**

Preparation, properties and uses.

23.Amines **2Hours**

classification. Basicity on the basis of pKb values.

24. Carbohydrates **4Hours**

Classification, open and ring structures of glucose, fructose. Ring structure of Maltose, sucrose and lactose. Partial representation of structure of cellulose, starch, and glycogen. Carbohydrates as a source of energy.

25 . Proteins: Amino acids **3Hours**

Classification. Formulae of amino acids such asglycine, alanine, serine, cysteine, aspartic acid, lysine & tyrosine. Peptidebond Functional properties of proteins such as enzymes, antibodies, transport agents & biochemical messengers (Hormones)

26. Nucleic acids-DNA and RNA **2Hours**

Purines and Pyrimidines bases. Biological importance of nucleic acids

26. Enzymes **2Hours**

Examples of different types of enzymes, their function in biological reactions.

27. Environmental chemistry: **4Hours**

Pollution of air, water, soil, major atmospheric pollutant, smog, acid rain effect on Ozone layer. Global warming. Strategies to control environmental pollution

28. Basic principles and technique in organic chemistry 5Hours

Qualitative and quantitative analysis. IUPAC naming. Electron displacement in co-valent bond. Inductive, electrometric, resonance and hyper conjugation effect. Homolytic and Heterolytic fission of covalent bond. Free radicals, carbonations, carbocations, electrophiles and nucleophiles.

29. Chemical Equilibrium. 3Hours

Rate of a reaction, rate equation expression factors influencing the rate. The law of mass action. Equilibrium constant. Reversible reaction with example, writing kc and kp for the reactions. Ammonia, phosphorus, penta chloride and hydrogen iodide. Discussion of Le Chatelier's principles to the synthesis of sulphur trioxide, problems.

30. Aromatic Hydro carbons 2Hours

Preparation and isolation of Benzene and Toluene. Important properties of Benzene and Toluene. Friedel-Crafts reaction.

31. Chemical bonding: 2Hours

Octet rule, co-valent bond, examples. Ionic orelectrovalent bond, bond length, sp1, sp2 and sp3 hybridization. Example for each type. Ethyne, ethane and methane. Writing the structure of NH^3 and water molecule.

32. Process of isolation of elements: 6Hours

- Occurrence of metals
- Extraction of crude metal from one-one
- Thermodynamic & electrodynamics principles of metallurgy
- Uses of Aluminium, copper, Zinc and iron

33. Chemical Kinetics: State of Chemical reaction, factors influencing rate of Chemical reaction, integrated rate equations, collision theory of chemical reactions.

SUBJECT TITLE: BIOLOGY
SUBJECT CODE: PBNYS-T103

Total Number of Hrs.: 150 hours		Theory: 130 hours		Practical: --20hours.
Credits: 6		5		1
Hrs./Week: 6 hours/week				
SCHEME OF EXAMINATION				
TOTAL MARKS: 100				
Theory: 100				Practical: --
Final Theory Exam	Internal Assessment	Viva Voce	Final Practical Exam	Internal Assessment
70	20	10	--	--

Goals:

The goal of introducing biology to students is to make them understand about living world, process of evolution, classifications of animal and plant kingdoms, bio-diversity & ecosystem.

Course Objectives:

- Living world, its characteristics of growth, evolution,
- Structure and function of the cell and its organelles.
- Digestion, absorption and assimilation of nutrients and its consequences of malnutrition.
- Molecular mechanism of gene expression, regulation and mutations
- Various aspects of metabolism and their regulatory pathways.

Course Outcomes (Cos) :

At the end of the course, the student should be able to demonstrate and understanding:

- **CO 1 -** To analyze the nutritional status in health and disease
- **CO 2 -** Demonstrate the skill of prevention in air pollution, sound pollution and soil pollution. There by preventing the diseases in human beings.

THEORY- 130 HOURS
DEMONSTRATION- 20 HOURS

I) Introduction To Biology **1Hour**

Branches of biology- cell biology (cytology), Anatomy, Physiology, Histology, Biochemistry, Developmental biology (Embryology), Genetics, Bio technology, Bio physics.

II) Cell: Structure & Functions **5Hours**

- Definition of cell, types of cell-prokaryotic and eukaryotic, Structure of cell. Cell components-plasma membrane, cytoplasm, and nucleus
- **Cell organelles (structure and function with diagram),** Endoplasmic reticulum, Golgi complex, Lysosomes, Peroxisomes, Mitochondria, Ribosomes, Centrosomes

III) Cell Cycle & Cell Division **5Hours**

Types of cell division- Mitosis, meiosis
Difference between mitosis and meiosis, its significance

IV) Viruses **3Hours**

- General structure of viruses
- Diseases caused by viruses- Japanese encephalitis, polio, mumps, measles, small pox, AIDS

V) Bacteria **6Hours**

- General structure of bacteria
- Types of bacteria based on shape
- Brief account of bacterial diseases- diphtheria, cholera, gonorrhoea, syphilis, plague, pneumonia, tetanus, typhoid, tuberculosis.

VI) Tissue **10Hours**

- Structure and functions of basic tissue
- Epithelium
- Connective tissue- Areolar tissue, adipose tissue, cartilage, bone, blood
- Muscular tissue
- Nervous tissue

IX) Evolution **6Hours**

- Origin of life
- What is existence of evolution
- What is adaptive Radiation
- Origin & evolution & man

X) Ecosystem **8Hours**

- Structure & functions
- Productivity
- Decomposition
- Energy Flow
- Ecological pyramids
- Ecosystem services

XI) Bio Diversity & Conversation **4Hours**

XII) Environmental Issues **8Hours**

- Air Pollution and its control
- water pollution and its control
- solid wastes
- Global Warming
- Ozone Depletions
- De forestation

XIV) Human Health & Disease **10Hours**

- Immunity
- Cancer
- Drugs and Alcohol abuse
- Common Disease in Human

XV) Microbes in Human Welfare **4Hours**

XVI) Genetics **10Hours**

XVIII) Human Physiology **50Hours**

a) Digestive system **6Hours**

- Mouth; Buccal cavity; Tongue; Oesophagus; Stomach; Intestine, Digestive glands (salivary gland, pancreas, liver)

b) Circulatory system **6Hours**

- Structure of heart; Blood vessels (Artery and vein); Mechanism of working of heart; Blood pressure; Heart beat; Heart sound

c) Respiratory system **6Hours**

- Larynx; Pharynx; Lungs; Alveoli; Diaphragm;
- Mechanism of respiration:
  - Breathing (inspiration & expiration)
  - External respiration (exchange of oxygen & CO2 between alveoli & blood)

d) Excretory System **5Hours**

Structure of Kidney, Structure of Nephron. Functions of kidney.

e) Nervous System **5Hours**

- Structure of neuron
- Basic structure and Functions of human brain and spinal cord.

f) Reproductive System

Male reproductive system **4Hours**

Testes, Vas deferens, epididymis, vas deferens, Cowper's gland, seminiferous tubules, seminal vesicle, urethra, structure of sperm

Female reproductive system **4Hours**

Uterus, Ovary, Fallopian tube, Graffian follicle

g) Sexually Transmitted Diseases **3Hours**

Meaning, causative organisms, mode of infection, symptoms & preventive measures of gonorrhoea, syphilis & AIDS

h) Special Sense Organs **5Hours**

Brief account of sense organs and functions. Structure of Eye.

i) Glands **6Hours**

- Types of glands- Endocrine and Exocrine
- Secretion of exocrine glands and function
- Secretion of Endocrine (pituitary, thyroid, adrenal) glands and their function

DEMONSTRATION **20Hours**

1. Study of microscope**,** microscopic study of typical cell,
2. Study of common medical devices (stethoscope, sphygmomanometer, thermometer, oxygen cylinder),
3. Charts and models of organs an organ system (digestive, respiratory, circulatory, reproductive, excretory, nervous)

SUBJECT TITLE: SANSKRIT
SUBJECT CODE: PBNYS-T104

Total Number of Hrs.: 70 hours		Theory: 70 hours		Practical:
Credits: 4		4		
Hrs./Week: 4hours/week				
SCHEME OF EXAMINATION				
TOTAL MARKS: 100				
Theory: 100				Practical: --
Final Theory Exam	Internal Assessment	Viva Voce	Final Practical Exam	Internal Assessment
70	20	10	--	--

GOALS AND OBJECTIVES

Goal:

The goal of teaching Sanskrit to undergraduate students is to provide a comprehensive knowledge of Sanskrit in order to be able to study, understand, comprehend and utilize the knowledge contained in Indian traditional texts in their professional practice, especially in the field of Yoga.

Course Objectives:

- Demonstrate knowledge of complete Sanskrit script;
- Describe kinds of nouns, verbs, pronouns, etc. with examples;
- Illustrate kinds of gender, number, and declensions employed in Sanskrit,
- Demonstrate skill in pronunciation of different kinds of Sanskrit words, phrases and sentences.

Course Outcomes (Cos) :

After the completion of the course, the student shall be able to

- **CO 1 -** Read and understand Sanskrit with respect to script and basic grammar.
- **CO 2 -** Familiarize themselves with various texts and compositions such as Madhurashtakam, Vaidyakeeyasubhashitasahityam, etc.;
- **CO 3 -** Speak fluently in Sanskrit after having learnt the various peculiar pronunciations.

THEORY (70Hours.)

इकाई- प्रथमा (20 Hrs)

1. वर्णो च्चारण शि क्षा (वर्ण, शब्द)

2. रचनानुवाद कौमुदी- (1-15 अभ्यस:)

3. माहश्वे र सूत्राणि

इकाई- द्वि तीया (15 Hrs.)

1. संज्ञा-प्रकरणम् गुणः, वृद्धि :, संहि ता, धातुः, संयोगः हस्व दीर्घ प्लुतः, अनुनासि कः, पदम् उपसर्गः

2. कारक-प्रकरणम्-वि भक्ति वचनम् (संक्षि प्त-पाठनम्)

इकाई - तृतीया (20 Hrs.)

1. सुबन्त प्रकरणम् - अकारान्त पुल्लि ङ्ग आकारान्त स्त्रीलि ङ्ग

2. ति ङन्त प्रकरणम् (परस्मैपदम्)

3. अव्यय-प्रकरणम् . च, सह, सार्धम्, अपि , खलु, एव

इकाई -चतुर्थी (10 Hrs.)

1. नि बन्धाः- संस्कृत भाषा, गीता सुगीता कर्तव्या आरोग्यम्,

Recommended books:

1. Vyakarna Pravesh
2. Prarambhik Rachana anuvad kaumidi,Kapil ji
3. Vivek Vairagya Shloka sanghraha
4. Shreemad Bhagwat Geeta
5. Vadik Shukta Sangharh
6. Vaman Sivaram Apte, Samskrata – English Dictionary, Samskrata Academy

BNYS 1st B (Part – 1)

BIOCHEMISTRY

Subject Title : BIOCHEMISTRY (Duration : 12 Months)

Subject Code : BNYS – T 101 & BNYS – P 101

Subject	Theory	IA	Total	Practical	Viva voce	IA	Total	Grand Total Marks
Biochemistry	80	20	**100**	60	30	10	**100**	**200**

*IA - **Internal Assessment**

Goals:

The goals of introducing to the undergraduate students is to make them understand the scientific basis of the life processes at the molecular level and to orient them towards the application of the knowledge in solving clinical problems.

Course Objectives:

- Molecular and functional organization of a cell, and sub-cellular components;
- Structure, function and interrelationship of biomolecules and consequences of deviation from normal;
- Basic and clinical aspects of enzymology and regulation of enzymatic activity;
- Digestion and assimilation of nutrients and consequences of malnutrition;
- Integration of the various aspects of metabolism, and their regulatory pathways;
- Biochemical basis of inherited disorders and their associated sequelae;
- Mechanisms involved in maintenance of body fluid and pH homeostasis;
- Molecular mechanisms of gene expression and regulation, the principles of engineering and their application in medicine;
- Molecular concepts of body defense and their application in medicine;
- Biochemical basis of environmental health hazards; and biochemical basis of cancer and carcinogenesis, principles of metabolism, and detoxification of xenobiotics.
- Principles of various conventional and specialized laboratory investigations and instrumentation, analysis and interpretation of a given data; the ability to suggest experiments to support theoretical concepts and clinical diagnosis.

Course Outcomes (Cos) :

At the end of the course, the student should be able to

- **CO 1 -**Make use of conventional techniques/ instruments to perform biochemical analysis relevant to clinical screening and diagnosis
- **CO 2 -**Analyze and interpret investigative data
- **CO 3 -** Demonstrate the skills of solving clinical problems and decision making.

THEORY (SECTION-I)

1. **Introduction and Prospects.**

2. **Proteins**
   a) Definition,
   b) Biological importance,
   c) Classification and properties,
   d) Structure of proteins,
   e) Coagulation and denaturation of proteins.

3. **Elementary aspects of the structure of :**
   a) Collagen,
   b) Myoglobin
   c) Hemoglobin.

4. **Enzymes**
   a) Definition,
   b) Classification,
   c) Specificity,
   d) Co-enzymes,
   e) Co-factors and activators,
   f) Diagnostic importance of enzyme
   g) Iso-enzymes

5. **Carbohydrates**
   a) Definition,
   b) Classification
   c) Biological importance
   d) Monosaccharide's – classification, properties and stereoisomerism,
   e) Oligosaccharides – importance of Disaccharides.
   f) Polysaccharides – Functions

7. **Lipids**
   a) Definition,
   b) Classification
   c) Biological importance.
   d) Simple lipids: Composition of criglycerol. Waxes.
   e) Compound Lipids: Function of Phospholipids, spongiolipids, & glycolipids.
   f) Derived lipids: Functions of fatty acids–properties of saturated and unsaturated fatty acids.

8. **Vitamins**
   a) Definition
   b) Classification
   c) Brief account of source
   d) Biochemical function
   e) Deficiency diseases
   f) Vitamin antagonists
   g) Hyper vitaminosis.

9. Minerals

a) Calcium,
b) Phosphorous,
c) Iron,
d) Copper
e) Zinc,
f) Magnesium
g) Manganese,
h) Lead,
i) Mercury,
j) Arsenic
k) Metal toxicity
l) Fluorine
m) Iodine.

10. Metabolism

a) Digestion and absorption of carbohydrates, lipids, proteins and nucleic acids.
b) Carbohydrate Metabolism
   - Glycogenesis,
   - Glycogenolysis
   - Krebs's cycle,
   - Glycolysis,
   - Pyruvate oxidation
   - Citric acid cycle,
   - Gluconeogenesis,
   - Metabolism of Fructose and Galactose,
   - Regulation of metabolic pathways,
   - Disorders of carbohydrate metabolisms,
   - Regulation of bloodsugar,
   - Glucosetolerance test,
   - Diabetesmellitus.

c) Lipid Metabolism
   - Lipogenesis,
   - Synthesis of fatty acids,
   - De-saturation,
   - Phospholipids,
   - Bio-synthesis of lecithin,
   - Cephalin and their breakdown oxidation of fatty acids,
   - Formation andutilisation of ketone bodies,
   - Ketosis,
   - Synthesis and breakdown of cholesterol,
   - Disorders of lipid metabolism,
   - Outlines and formation and functions of prostaglandin's and leucotrienes,
   - Fatty liver
   - Lipotropic factors.

d) Metabolism of proteins and amino acids
   - Breakdown of tissue proteins,
   - Amino acids pool,
   - General metabolism of amino acids,
   - Disposal of ammonia,
   - Urea cycle formation of glutamate and glutamine,
   - Disorders of amino acids metabolism.

e) Purine and Pyrimidine metabolism
   - Outline of synthesis and break down of purine and pyrimidine
   - Disorders of metabolism of purine and pyrimidine.

11 . Liver function

a) Liver function tests,
b) De-toxification,
c) Mechanisms.

12. Kidney Function tests

a) Composition of urine,
b) Urea clearance
c) Creatinine clearance

13. Energy metabolism (BMR)

a) Basal metabolic rate and its importance,
b) Calorific values of food or unbalanced diet,
c) Protein energy malnutrition (PEM),
d) Essential fatty acids,
e) Dietary habits and diseases,
f) Biochemistry of starvation.

SECTION-II

1. Demonstration of:

a) Blood sugar
b) Blood urea
c) Total serum protein
d) Total serum calcium
e) Total serum cholesterol
f) Total serum bilirubin

2. Determination of :

a) Albumin, Urea and Sugar in urine.

Note: Section – II of practical shall be conducted by teaching staff as a part of demonstration /seminarin the laboratory.

RECOMMENDED TEXTBOOKS:

1. Textbook of Biochemistry for Medical Students – DM Vasudevan, Sreekumari S, Kannan Vasudevan
2. Textbook of Biochemistry – Dr. U Satyanarayana, Dr. U Chakrapani
3. Biochemistry for Medical Students – Dr. Debjyoti Das
4. Textbook of Biochemistry – Dr. SK Gupta
5. Textbook of Biochemistry – Dr. Rama Rao
6. Textbook of Biochemistry– by West and Todd.

REFERENCES:

1. Harper's Illustrated Biochemistry
2. Lehninger's Principle of Biochemistry
3. Lippincott's Biochemistry

PRACTICAL MANUALS:

1. Practical Textbook of Biochemistry – Vasudevan DM, Sober Kumar Das
2. Manual of Practical Biochemistry for MBBS – Dr. Gupta SK, Dr. Jain Anjou

References:

1. Practical Biochemistry – Varley
2. Laboratory Manual of Biochemistry – By. Pattabhiram and acharya

PHILOSOPHY AND PRACTICE OF YOGA

Subject Title : PHILOSOPHY AND PRACTICE OF YOGA (Duration : 12 Months)

Subject Code : BNYS – T 102 & BNYS – P 102

Subject	Theory	IA	Total	Practical	Viva voce	IA	Total	Grand Total Marks
Philosophy and Practice of Yoga	80	20	**100**	60	30	10	**100**	**200**

*IA - **Internal Assessment**

Goal:

The goal of teaching Yoga to undergraduate students is to familiarize them with basic principles of Yoga with respect to history, definitions, philosophy and practices of Yoga, with emphasis of Ashtanga Yoga.

Course Objectives:

After the completion of the course, the student shall be able to

- Explain the various definitions of Yoga, history of Yoga and branches of Yoga;
- Describe kinds of Yogasana, its importance, methods, rules, regulations and limitations;
- Illustrate the various limbs of Ashtanga Yoga;
- Demonstrate knowledge of Pranayama, prana and lifestyle, breathing and lifespan.

Course Outcomes (Cos) :

After the completion of the course, the student shall be able to:

- **CO 1 -** Demonstrate various types of Yogasana in their correct method of performance;
- **CO 2 -** Demonstrate different Pranayama.
- **CO 3 -** Explain about the definitions, origin, branches of Yoga.

THEORY

1. **Introduction & definitions :** **10 Hours**
   a) What is yoga?
   b) Various definitions of yoga,
   c) Purpose of yoga,
   d) Current views regarding yoga.
2. **History of yoga** **20 Hours**
   a) Yoga before the time of Patanjali,
   b) Indus Valley civilization,
   c) Vedas,
   d) Upanishads,
   e) Smriti Literature.
3. **Post Patanjali developments of yoga.** **8 Hours**

4. Originals System of yoga **32 Hours**

a) Hiranyagarbha - yoga,
b) Samkhya and yoga,
c) Buddhism and yoga,
d) Jainism and yoga,
e) Systematization of yoga by Sage Patanjali,
f) Contribution of "Vyasa " commentary to Patanjali yoga
   i. Chittavritti,
   ii. Abhyas-vairagya,
   iii. Ishwar pranidhan,
   iv. Samadhi.

5. Outlines on Branches of yoga **40 Hours**

a) Raj Yoga,
b) Hatha yoga,
c) Jnan yoga
d) Karma Yoga,
e) Bhakti yoga
f) Ashtanga Yoga,
g) Mantra yoga,
h) Laya yoga.
i) Kriya yoga

6. Rules and regulation for yoga. **20 Hours**

a) Concept of Matha,
b) Mitahara,
c) Pathya-Apathya of Ritukal,
d) Sadhak - Badhak tatva.

7. Introduction to yoga asanas : **20 Hours**

a) Meaning and definition of Asana,
b) Importance of Asanas,
c) Yogasana & Pranayam and the body,
d) Mind connection with asana,
e) Difference between Yoga Asana & Exercises ,
f) Classification of yogasana :
   i. Beginners group,
   ii. Intermediate group,
   iii. Advanced group,
   iv. Dynamic ,
   v. Static yogasana,

8. Introduction to Pranayama :

a) Meaning , definition and types of pranayam,
b) Pranic body, Prana and lifestyle,
c) Breadth health and Pranayama,
d) Breathing and life span,
e) Pranayama and Spiritual aspirants.
f) Concept of Rechak (Exhale), Purak (Inhale), kumbhaka (Retention),
g) Types of Prana & sub prana.

9. Yoga Asanas Practise- **40 Hours**

a) Yogic jogging,
b) Eight Baithak ,
c) Twelve Dand,
d) Therapeutic yoga asana recommended by Yogrishi Swami Ramdev ji,
e) Surya Namaskar

1. Tadasana
2. Tiryakatadasan
3. Vrkrasana
4. Trikonasana
5. ParivrttaTrikonasana
6. Virabhadrasana
7. Utkatasana
8. Padangusthasana
9. Padahastasana
10. Samakonasana
11. Dwikonasana
12. Utthitalolosana
13. Dolosana
14. Ardhachakrasana
15. Katichakrasana
16. Padamool
17. Garudasan
18. Prarambhiksthiti
19. RajuKarshanasana
20. Gatyatmakmeruvakrasana
21. Chakkichalanasana
22. NaukaSanchalanasana
23. KashtaTakshanasana
24. Namaskarasana
25. Kawachalasana
26. Udarakarashanasana
27. Gomukasana
28. Sukhasama
29. Ardhapadmasana
30. Padmasana
31. Siddhasana
32. Siddhayoniasana
33. Dhyanaveerasana
34. Simhasana
35. Vajrasana
36. Anandamadrisana
37. Padadhirasana
38. Bharasana
39. Veerasana
40. MarjariAsana
41. Vyagrasana
42. Shashankasan
43. Pranamasana
44. ArdhaUshitvasana
45. Ustrasana
46. SuptaVajrasana
47. Parvatasana
48. Paschimottanasan
49. JanuSirshasana
50. MeruWakrasana
51. Ardhamatsyendrasana
52. Setubandhasana
53. Naukasan
54. ArdhaPawanamuktasan
55. Pawanamuktasan
56. BaddaPadmasana
57. Yogamudrasana
58. Bhujangasana
59. ArdhaShalabasan
60. Shalabasan
61. Dhanurasan
62. Chakrasana
63. Vipareethakarni
64. Sarvangasana
65. Matsyaasana
66. Makrasana
67. Shavasana
68. Halasana

10. Breathing Exercises - types of Breathing **8 Hours**

11. Pranayama - yogic Breathing **8 Hours**

- Eight Pranayama by Yogrishi Swami Ramdev ji Maharaj
- Nadi Shodhan Pranayama.

12. Meditation - Its types **8 Hours**

13. Shatkarma – **16 Hours**

- Neti - Jal Neti ,Sutra Neti.
- Dhauti – Dand, Vastra Dhauti.
- Kapalbhati - Sheetkarm, Vyut karma
- Vaman.

PRACTICAL

1. Relaxation techniques
2. Sukshma vyayama
3. Stretches
4. Mudras and Bandhas
5. Suryanamaskara (Sun salutation)

6. Asanas
   - Standing: tadasana; Ardha kati chakrasana; Kati chakrasana; Trikonasana; vrikshasana; Utthita trikonasana; Veerabhadrasana; Parsvottanasana; Parighasana; etc.
   - Supine: Shavasana; Matsyasana; Sarvangasana; Halasana; Chakrasana; Pawanmuktasana; Sethubandhasana; Purvottanasana; Vipareetakarani; Karnapeedasana; Suptakonasana; etc.
   - Prone: Makarasana; Bhujangasana 1 &2; Ardhashalabhasana; Shalabhasana- 1; Dhanurasana; Adhomukhasvanasana; etc.
   - Sitting: Vakrasana; Ardhamatsyendrasana; Paschimottanasana; Ushtrasana; Vajrasana; Padmasana; Baddhapadmasana; Janusirshasana; Upavishtakonasana; Shashankasana; etc.

7. Pranayama: Bhastrika; Sheetkari; Sheetali; Anuloma-viloma; Ujjayi; Bhramari; Kapalbhati; Udgeet; Bahya pranayama.
8. Kriya: Jala Neti; Sutra Neti; Vamana Dhauti; Trataka; Shankh Prakshalan.

RECOMMENDED BOOKS:

1. Daily Yoga Practice Routine – Acharya Balkrishnaji
2. Pranayama Rahasya – P.P. Swami Ramdevji
3. Yog, its Philosophy and Practice – P.P. Swami Ramdevji
4. Yog Vignanam – Acharya Balkrishnaji
5. Basis and Definitions of Yoga- Vivekananda Kendra
6. Asanas- Swami Kuvalyananda
7. Asanas, Pranayama, Bandhas, Mudras – Swami Satyananda Saraswathi
8. Hatha Yoga Pradipika – Swami Svatmarama(commentary by Swami Muktibodhananda)
9. Raja, Hatha, Jnana, Bhakti Yoga – Swami Vivekananda

REFERENCE BOOKS

1. Yog Samanya Gyan – P.P Swami Ramdevji
2. Yog World Encyclopedia – Acharya Balkrishnaji

संस्कृत (SANSKRIT)

Subject Title : संस्कृत SANSKRIT (Duration : 12 Months)

Subject Code : BNYS – T 103

Subject	Theory	IA	Total	Practical	Viva voce	IA	Total	Grand Total Marks
Sanskrit	80	20	**100**	-	50	-	**50**	**150**

*IA - **Internal Assessment**

Goal:

The goal of teaching Sanskrit to undergraduate students is to provide a comprehensive knowledge of Sanskrit in order to be able to study, understand, comprehend and utilize the knowledge contained in Indian traditional texts in their professional practice, especially in the field of Yoga.

Course Objectives:

- Demonstrate knowledge of complete Sanskrit script;
- Describe kinds of nouns, verbs, pronouns, etc. with examples;
- Illustrate kinds of gender, number, and declensions employed in Sanskrit,
- Demonstrate skill in pronunciation of different kinds of Sanskrit words, phrases and sentences.

Course Outcomes (Cos) :

After the completion of the course, the student shall be able to :

- **CO 1 -** Read and understand Sanskrit with respect to script and basic grammar.
- **CO 2 -** Familiarize themselves with various texts and compositions such as Madhurashtakam, Vaidyakeeyasubhashitasahityam, etc.;
- **CO 3 -** Speak fluently in Sanskrit after having learnt the various peculiar pronunciations.

THEORY

इकाई-प्रथमा (२० घंटे)

१. वर्णोच्चारण शिक्षा (वर्ण:,शब्द: स्थानम् प्रयत्नम्)

२. प्रत्याहार प्रकरणम् (माहेश्वर सूत्र सहितम्)

३.कारक - प्रकरणम् (सूत्र सहितम्)

४. विभक्ति वचन प्रकरणम् (सूत्र सहितम्)

५. सर्वनाम, विशेषण, उपसर्ग प्रकरणम्

६. ऋतु एवं दिनों के नाम

इकाई - द्वितीय (२० घंटे)

१. रचनानुवाद प्रथम भाग- (अभ्यास- १ से ३० तक)
२. सुबन्त- प्रकरणम् कौमुदी(पुल्लिंग स्त्रीलिंग नपुंसकलिंग- (रचनानुवाद कौमुदी प्रथम भाग)
३. तिङन्त- प्रकरणम् -(रचनानुवाद कौमुदी प्रथम भाग)
४. अव्यय - प्रकरणम्-(रचनानुवाद कौमुदी प्रथम भाग)
५. वाच्य परिवर्तन(कर्मवाच्य भाववाच्य)

इकाई - तृतीय (२० घंटे)

१. सन्धि-प्रकरणम् -अच् , हल,विसर्ग,संधि (रचनानुवाद कौमुदी प्रथम भाग)
२. समास- प्रकरण,-
   i. अव्ययीभावः
   ii. तत्पुरुषः
   iii. द्वन्द्वः
   iv. बहुब्रीह
३. पर्यायवाची शब्द प्रकरणम्(निघण्टु)
   जल, मेघ, समुद्र, राजा, पृथ्वी, पर्वत, वृक्ष, रात्रि , चन्द्रमा, सूर्य, अग्नि, वायु,
४. संख्यावाची शब्द संख्याए

इकाई –चतुर्थ (२० घंटे)

१. प्रत्यय-प्रकरणम् (कृत्य-प्रत्यय) क्त,क्त्वा , तवत् , तुमुन् , तव्यत् , तृच् ,
२. निबंध - प्रकरण

- संस्कृत का महत्व
- सनातन धर्म
- योग आयुर्वेद
- महर्षि दयानंद सरस्वती

इकाई - पञ्च (२० घंटे)

१. विवेक वैराग्य श्लोक संग्रह(पुस्तक) समर्पण प्रार्थना भक्ति प्रार्थना ईश प्रार्थना और सभी छंद के दो-दो श्लोक
२. स्वस्तिवाचन सूक्त(पञ्च मंत्र)
३. श्रद्धा सूक्त (पञ्च मंत्र)
४. संगठन सूक्त(चार मंत्र)
५. श्रीमद्भागवत गीता (१२,१६ अध्याय)
६. ईशोपनिषद्

Recommended books:

7. Vyakarna Pravesh
8. Prarambhik Rachana anuvad kaumidi,Kapil ji
9. Vivek Vairagya Shloka sanghraha
10. Shreemad Bhagwat Geeta
11. Vadik Shukta Sangharh
12. Vaman Sivaram Apte, Samskrata – English Dictionary, Samskrata Academy

BNYS 1st B (Part – 2)

HUMAN ANATOMY

Subject Title : HUMAN ANATOMY (Duration : 18 Months)

Subject Code : BNYS – T 104A , BNYS– 104B & BNYS – P 104

Subject	Theory	IA	Total	Practical	Viva voce	IA	Total	Grand Total Marks
Human Anatomy – I	80	20	**200**	60	30	10	**100**	**300**
Human Anatomy – II	80	20						

*IA - **Internal Assessment**

Goal:

It aims at giving inclusive knowledge of the gross and microscopic structure and development of human body to provide a basis for assessing the correlation of organs and structures and anatomical basis for disease presentations.

Course Objectives:

- Understand normal human anatomy clinically important inter-relationship and functional anatomy of bodily structures;
- Comprehend histological structures of various tissues and organs and co-relate structure and function in order to understand diseased states;
- Recognize basic structure and connections of the central nervous system, Understand the regulation and integration of various organs and systems and be skilled in locating lesion sites according to deficits in diseased states;
- Explain developmental basis of variations and abnormalities with respect to sequential development of organs and systems, teratogens, genetic mutations and environmental hazards.

Course Outcomes (Cos) :

After completion of the program, the student must be able to:

- **CO 1 -** Locate and identify body structures including topography of living body; Histologically, identify tissues and organs;
- **CO 2 - I**dentify gross congenital anomalies and be familiar with the principles of Karyotyping;
- **CO 3 -** Interpret new imaging techniques such as CT, Sonogram, MRI etc. after understanding their basic principles;
- **CO 4 -** Understand clinical basis of some common clinical procedures i.e., intramuscular and intravenous injection, lumbar puncture and kidney biopsy etc.

THEORY

(SECTION-I) **(**BNYS – T 104A)

I. GENERAL INTRODUCTION:

a. Importance of the study of Anatomy.
b. Definitions & Subdivisions
c. Systems of the body
d. Structure of the cells
e. Terminology ,Anatomical positions, Planes & Surfaces.

II. OSTEOLOGY:(Including Ossification& Related Histology)

a) Types of Bones.
b) Classification of Bones.
c) Description of various bones of:
   i. Upper limb
   ii. Thorax
   iii. Abdomen and pelvis
   iv. Vertebral column including cervical region

III. ARTHROLOGY:

a) Classification of Joints
b) Construction of Joints
c) Description of various joints of:
   i. Upperlimb
   ii. Thorax
   iii. Pelvis
   iv. Vertebral column

IV. MYOLOGY:

a) Types of Muscles
b) Muscles of Upper limb, Thorax, Abdomen and Pelvis
c) Origin ,insertion ,Blood supply ,nerve supply and actions of these muscles

V. RESPIRATORYSYSTEM:

a) Upper respiratory tract–Nose, Pharynx, larynx
b) Trachea & Bronchial tree.
c) Lungs
d) Pleura
e) Mediastinum

VI. CARDIOVASCULAR SYSTEM:

a) Heart– Position, Surface anatomy and its description.
b) Great vessels – Aorta, Pulmonary trunk, superior vena cava, inferior vena cavaand their branches.
c) Arteries and Veins – Structure of arteries and veins, important arteries & veins ofthe body.

VII. DIGESTIVE SYSTEM:

a) Oral cavity,
b) Teeth,
c) Hard palate,
d) Soft palate,
e) Esophagus,
f) Stomach,
g) Small Intestine(Duodenum, Jejunum & Ileum)
h) Large intestine (Casecum, Appendix, ascending colon, transverse colon, descending colon, sigmoid colon ,rectum)
i) Anal canal,
j) Anus,
k) Liver,
l) Gall bladder,
m) Bile duct,
n) Pancreas,
o) Spleen,
p) Peritoneum,
q) Mesentery and their position in the abdominal quadrants.

VIII. URINARY SYSTEM:

a) Kidneys: position, surfaces, internal structures.
b) Ureters
c) Urinary Bladder
d) Male Urethra
e) Female Urethra

IX. LYMPHATIC SYSTEM:

Description of: Lymph, Lymph glands, Lymph ducts, Thoracic duct and Cysternachyli.

X. REGIONAL ANATOMY:

a) Histology,
b) Embryology,
c) Myology,
d) Anthrology & Osteology of :
   I. Upper limb
   II. Thorax
   III. Abdomen & Pelvis

SECTION- II
(BNYS – T 104B)

I. OSTEOLOGY: (Including Ossification and related Histology)

Description of various bones of:

a) Lower limb

b) Skull as a whole

c) Individual Cranial bones of skull

II. ARTHROLOGY:

Description of various joints of:

a) Lower limb

b) Skull

c) Skull &Vertebral column

III. MYOLOGY:

Description of various muscles of:

a) Lower limb

b) Head

c) Neck

(Origin, Insertion, Blood Supply, Nerve supply and actions of these muscles)

IV. REPRODUCTIVE SYSTEM:

1. Male Reproductive organs:

i. Scrotum
ii. Penis
iii. Glands
iv. Testes
v. Vas deferens
vi. Spermatic cord
vii. Epidermis
viii. Seminal vesicles,
ix. Ejaculatory duct
x. Prostate gland etc.

2. Female Reproductive system:

a) External genital organs:

i. Vulva.
ii. Clitoris
iii. Vagina.

b) Internal genital organs:

i. Uterus,
ii. Cervix,
iii. Fallopian tubes,
iv. Ovaries,
v. Ligaments of Uterus & Ovaries.

c) Mammary glands

V. ENDOCRINE SYSTEM:

Description of:

a) Pituitary,
b) Pineal,
c) Thyroid,
d) Parathyroid,
e) Thymus,
f) Spleen,
g) Pancreas,
h) Suprarenal,
i) Ovaries &Testes.

VI. ORGANS OF SPECIAL SENSES:

a) Tongue
b) Nose
c) Eye ball & associated structures, Lacrimal apparatus
d) Ear: Description of external ear, middle ear and internal ear.
e) The integumentary system: Description of skin & its appendages.

VII. DEMONSTRATION OF DISSECTED PARTS OF:

a) Lower limb
b) Head & Neck
c) Brain & Spinal Cord
d) Organs of Special senses.
e) Cranial nerves.

VIII. Regional Anatomy:

a) Myology , Anthrology & Osteology of:
   i. Lower limb
   ii. Head & Neck
b) Brain & Spiral cord

c) Special sense

PRACTICALS

Gross Anatomy (demonstration of following)

Upper limb

- Pectoral, Scapular, Shoulder, Arm, Forearm
- Projected parts: Joints, Palm & Dorsum of Hand

Thorax

- Chest Wall, Mediastinum, Lungs & Heart

Abdomen

- Anterior abdominal wall and inguinal wall and inguinal region, viscera and posterior abdominal wall

Pelvis

- Pelvic viscera and blood vessels and nerve sagital section(M&F)

Lower Limb

- Thigh, gluteal region, back of thigh, knee joint, leg ankle joint and foot
- Prosecuted parts – sole of foot and joints

Head and neck

- Scalp, superficial and deep dissection of face and neck
- Prosecuted parts: orbit, eyeball, submandibular region, temporal and infra temporal fossa, cranial cavity, naso and oro-pharyngeal regions, larynx, pharynx. Cross section at C4, C6 levels, sagittal section of head and neck

Nervous system:

- Section of brain and prosecuted specimens and major functional areas; gross structure of brain and spinal cord and study of gross sections as mentioned earlier (in brief)

RECOMMENDED BOOKS:

1. Textbook of Anatomy(All 3 volume) – BD Chaurasia
2. Human Anatomy for students – BD Ghosh
3. Practical Anatomy – Cunningham
4. Human Embryology – Inderbir Singh
5. Bailey's Textbook of Histology
6. Medical Embryology – Langmann
7. Textbook of Clinical Anatomy – Lata V Prabhu
8. Textbook of Genetics – Dr, Gangane
9. Golden Facts of Anatomy – Dr. Vishram Singh

REFERENCE BOOKS:

1. Textbook of Anatomy – Henry Gray
2. Atlas of Histology – Diforie
3. Colour Atlas of Human Anatomy – McMinn
4. Grants Method of Anatomy - Grant

PHYSIOLOGY

Subject Title : PHYSIOLOGY (Duration : 18 Months)

Subject Code : BNYS – T 105A , BNYS– 105B & BNYS – P 105

Subject	Theory	IA	Total	Practical	Viva voce	IA	Total	Grand Total Marks
Physiology-I	80	20	**200**	60	30	10	**100**	**300**
Physiology –II	80	20						

*IA - **Internal Assessment**

Goals:

The goal of teaching Physiology to undergraduate students is aimed at giving the students comprehensive knowledge of the normal functions of the organ systems of the body facilitate comprehension of the physiological basis of health and disease.

Course Objectives:

- Explicate the normal functioning of all the organ systems and their interactions for well-coordinated body functions;
- appreciate the relative contribution of each organ system to the homeostasis;
- Explain the physiological aspects of normal growth and development;
- Illustrate the physiological response and adaptations to environmental stresses;
- List physiological principles underlying pathogenesis and disease management.

Course Outcomes (Cos) :

After the completion of the programs, the students should be able to:

- **CO 1 -** Conduct experiments designed to study physiological phenomena;
- **CO 2 -** Interpret experimental/investigative data;
- **CO 3 -** Differentiate between normal and abnormal data from results of tests, which he/she has done and observed in the laboratory.

THEORY

(SECTION-I) (BNYS – T 105A)

1. **Physiology Homeostasis**:
   - 1.1 Definition and mechanisms of maintenance of homeostasis.
   - 1.2 Cell physiology
   - 1.3 Membrane physiology
   - 1.4 Transportation of various substances acrosscell membrane
   - 1.5 Resting membrane potential and actionpotential
   - 1.6 Acid-basebalance,water and electrolyte balance.

2. Haemopoetic system:

2.1 Composition, Functions of Blood & Blood Cells,
2.2 Haemopoiesis (Stages & Development of RBC, WBC, PLATELETS)
2.3 Composition & Functions of Bone Marrow,
2.4 Structure, Types & Functions of Haemoglobin,
2.5 Mechanism of Blood Clotting,
2.6 Anticoagulants,
2.7 Physiological Basis of Blood Groups,
2.8 Plasma Proteins,
2.9 Introduction to Anaemia & Jaundice.

3. Cardio-vascular system:

3.1 Functional anatomy of cardio vascular system.
3.2 Cardiac cycle, Heartsounds.
3.3 Regulation of cardiac output and venous return.
3.4 Physiologicalbasis of ECG.
3.5 Heart-rate and its regulation.
3.6 Arterial pulse.
3.7 Systemic arterial blood pressure and its control.

4. Respiratory System:

4.1 Functional anatomy of Respiratory system.
4.2 Functions of Respiratory System
4.3 Mechanism of respiration
4.4 Definition of ventilation
4.5 Exchange and transport of gases
4.6 Neural and chemical control of respiration
4.7 Lung volumes and capacities.
4.8 Artificial respiration, asphyxia, hypoxia.
4.9 Introduction to Pulmonary Function Tests.

5. Digestive System:

5.1 Functional anatomy of gastro-intestinal tract
5.2 Mechanism of secretion and composition of different digestive juices.
5.3 Functions of salivary glands, stomach, liver, pancreas, small intestine and large intestine in the process of digestion and absorption.
5.4 Movements of the gut (deglutition, peristalsis, defecation) and their control.
5.5 Enteric nervous system.
5.6 Digestion and metabolism of proteins, fats and carbohydrates.
5.7 Vitamins & Minerals-sources, daily requirement, functions, manifestations of hypo and hypervitaminosis.

6. ExcretorySystem:

6.1 Functional anatomy of urinary tract
6.2 Functions of kidney.
6.3 Mechanism of formation of urine
6.4 Control of micturition.
6.5 Formation of faeces and mechanism of defecation.

SECTION- II
(BNYS – T 105B)

7. Endocrine System:

7.1 General introduction to endocrine system
7.2 Classification and characteristics of hormones
7.3 Physiology of all endocrine glands, their functions and their effects.

8. Reproductive system:

8.1 Description of ovulation
8.2 Description of spermatogenesis
8.3 Description of oogenesis
8.4 Description of menstrual cycle.

9. Nerve Muscle Physiology:

9.1 Comparison of physiology of skeletal muscles
9.2 Cardiac muscles and smooth muscles.
9.3 Physiology of muscle contraction.
9.4 Neuro-muscular junction, excitation-contraction coupling.

10. Immunity:

10.1 Classification of immunity: Innate, acquired and artificial.
10.2 Different mechanisms involved in immunity: Humoral (B-cell mediated) and T-Cell mediated immunity.
10.3 Hypersensitivity.

11. Nervous system:

11.1 General introduction to nervous system, neurons
11.2 Mechanism of propagation of nerve impulse
11.3 Physiology of CNS, PNS, ANS
11.4 Physiology of sensory and motor nervous system
11.5 Functions of different parts of brain
11.6 Physiology of five special senses – Ear, Nose, Eyes, Skin, Tongue
11.7 Intelligence, memory, learning and motivation
11.8 Physiology of sleep and dreams, EEG. Physiology of speech and articulation.

PRACTICAL PART– I

1. Human Physiology Experiments :

1. Recording of blood pressure in human beings and study of effects of exercise on blood pressure.
2. Electro cardiography (Demonstration)
3. Clinical examination of CVS and radial pulse.

4. Pulse, respiration and temperature chart with correlation.
5. Clinical examination of CNS.
    a) Motor functions.
    b) Sensory functions.
    c) Cranial nerves.
    d) Reflexes–superficial and deep.
6. Determination of vital capacity and maximum ventilatory volume with spirometry (Demonstration)

Note:-The above human physiology experiments are to be conducted with demonstration as a joint venture by physiologists and the clinical faculty, if necessary Recommended text books for physiology

2. Hematology

1. Preparation and examination of peripheral blood smear and determination of differential leukocyte count.
2. Determination of total red blood cell count.
3. Determination of total leukocyte count.
4. Determination of ESR, PCV.
5. Determination of hemoglobin concentration of blood.
6. Determination of ABO and Rh blood groups.
7. Determination of bleeding time and clotting time.

RECOMMENDED BOOKS:

1. Medical physiology – A.K. Jain
2. Medical physiology – Mahapatra
3. Concise text book of Medical Physiology- S.K.Choudhary

REFERENCE BOOKS:

1. Textbook Of Medical Physiology- AC Guyton And Hall
2. Best And Taylor's Physiological Basis Of Medical Practice
3. Medical Physiology – Ganong
4. Practical Physiology - C.L.Ghai
5. Practical Physiology – Parvathi Pai

PHILOSOPHY OF NATURE CURE

Subject Title : PHILOSOPHY OF NATURE CURE (Duration : 18 Months)

Subject Code : BNYS – T 106A , BNYS– 106B & BNYS – P 106

Subject	Theory	IA	Total	Practical	Viva voce	IA	Total	Grand Total Marks
Philosophy of Nature cure-I	80	20	**200**	60	30	10	**100**	**300**
Philosophy of Nature cure–II	80	20						

*IA - **Internal Assessment**

GOALS AND OBJECTIVES

Goals:

The goals of introducing philosophy of Naturopathy to the undergraduate students is to make them understand philosophical basis of the system of Naturopathy, including concepts of health, causes and pathogenesis of disease and brief introduction to the various therapeutic modalities used in Naturopathy.

Course Objectives:

- Elucidate the history of Naturopathy including major contributors to the field and their work;
- Understand the evolution and composition of the human body according to different schools of medicine such as Naturopathy, Yoga, Ayurveda, Homeopathy, Modern Medicine, etc.
- Firmly establish his/her diagnostic and therapeutic thought processes in the fundamental principles of Naturopathy:
  1. Laws of nature according to Henry Lindlahr
  2. Concepts of health and disease according to Naturopathy
  3. Ten basic principles of Naturopathy
  4. Concept of Panchamahabhoota and Naturopathy
  5. Foreign matter, toxin accumulation, theory of Toxemia, Unity of disease and Unity of Cure, Concept of vitality
  6. Panchatantra, Shareera Dharma's
  7. Holistic approach of Naturopathy
  8. Modern perspectives of Naturopathy
  9. Natural rejuvenation.
- Understand naturopathic viewpoints of concepts like hygiene, vaccination, family planning personal life and prevention of diseases, geriatrics, etc., and implement them in his/her practice
- Understand Principles behind using the diagnostic procedures of Naturopathy, like spinal diagnosis, facial diagnosis, Iris diagnosis, and chromo diagnosis.

- Demonstrate knowledge of recent advances and research in Naturopathy principles/theories.

Course Outcomes (Cos) :

At the end of the course, the student will be able to:

- **CO 1 -** Demonstrate basic knowledge of the various therapeutic modalities utilized in Naturopathy;
- **CO 2 -** Describe the various principles of Naturopathy with respect to the body, health, disease and therapy.

THEORY

(SECTION-I) (BNYS – T 106A)

1. **What is Nature cure ?**
2. **Definitions of Nature Cure and History of Naturopathy.**
3. **Three fold constitution of man (Body, mind& soul) ,** evolution of human body.
4. **Composition of human body according to Ayurveda, Naturapathy, Yoga , Homopathy and Modern Medicine.**
5. **Symphony of life.**
6. **Basic Principles of Nature Cure and Six Fundamental principle of Naturopathy.**
7. **Catechism of Nature Cure**
   a)Constructive Principle
   b)Destructive Principle
   c)Health
   d)Disease
   e)Acute disease
   f) Chronic disease
   g)Healing crisis
   h)Disease crisis
   i) Cure
   j) Normal/Natural
8. **Laws of Nature and various theories of Naturopathy.**(Foreign matter theory, theory of Toxmia)
9. **Primary causes of disease and its manifestations.**
10. **Unity of disease and Unity of cure**
11. **Nature cure in relation with panchamahabhutas.**

12. Inflammation:

- Its different stages
- Suppression during the different stages of inflammation.

13. Conservation of Vitality and vital economy.

14. How to acquire natural immunity .

15. Ways to pray.

16. Philosophy and History of Indian Naturopaths :

a. Mahatma Gandhiji
b. Vinoba Bhave
c. Krisham Raju
d. Laxman Sharma
e. B.Venkat Rao
f. Vitlaldas Modi
g. S.J. Singh
h. Kulranjan Mukherjee
i. Dinsha Mehta

17. Philosophy and History of Foreign Naturopaths

a. Hippocrates
b. Vincent Priesnitz
c. Sebastian Kneipp
d. Louish Kunhe
e. Henry Lindlhar
f. Herbert Shelton
g. J.H. Kellog
h. Adolf just
i. Sigmund Freud
j. Aesculapius
k. John H Tilden
l. The School of Salerno
m. Bernard Macfeddon
n. Bernard Jenson
o. Arnold Ehret
p. Paracelsus

SECTION- II

(BNYS – T 106B)

1. **Arogya Raksha Pamchatantras** : their importance in prevention of disease and maintaining good health.

2. **Properties of :**
   a) Water,
   b) Mud,
   c) Air,
   d) Sunlight.

3. **Health is positive and Disease is Negative.**

4. **Importance of physical and mental hygiene.**

5. **Toxins and antitoxins in Nature cure way.**

6. **Vaccination their effects on human body and mind.**

7. **Old age problems and natural rejuvenations.**

8. **Family planning by natural therapeutics.**

9. **Role of diet and yoga in nature cure.**

10. **Nature cure Vs. Modern medicine.**

11. **An introduction to Nature cure diagnostic methods**
    a) Facial diagnosis
    b) Irodiagnosis
    c) Spinal analysis
    d) Chromo diagnosis.
    e) Tongue dignosis

12. **Outlines on**
    a) Regular habits for health
    b) Rest and Relaxation
    c) Live food - Nature diet (Satwik, Tamasic, Rajasik)
    d) Fasting
    e) Exercises.

13. **Basic concepts in Nutrition and balanced diet.**

14. **Outlines on treatment**

    a) Enema
    b) Hip Bath
    c) Spinal bath
    d) Steam bath
    e) Foot bath
    f) Mud Pack
    g) Water drinking
    h) Fomentation
    I) Infra Red Ray

15. Fundamental of Allopathy

a) Introduction
b) History
c) Principles

PRACTICALS

I. Students should be introduced to various treatment procedures used in Naturopathy.
II. Students should have knowledge of giving various treatments.
III. Demonstration of:
   (a) **Live Food** (Natural Diet/ Raw diet).
   (b) Sathvic & boiled diet.
   (c) Ways of serving, various special diets.
   (d) Salad Preparation
IV. Practicals with record.
V. Visiting to various Nature cure Clinics/hospitals.

TEXT BOOKS

a) Philosophy of Nature cure - By Henry Lindlahr.
b) Practice of Nature Cure - By Henry Lindlahr.
c) Human Culture and Cure - By Dr. E.D. Babbit
d) Practical Nature Cure - By Dr .K. Laxmana sarma
e) History and Philosophy of Nature Cure - By S.J. Singh
f) My Nature Cure - By M.K. Gandhi
g) Natural health care– A to Z - By Belinda Gran
h) Introduction to Natural Hygiene- Herbert M. Shelton
i) Panchatantra - By Dr. Venkat
j) The Science of facia lexpression- By Dr. Louis Kuhne

REFERENCE BOOKs:-

a) My Nature cure or practical - By S.J. Singh Naturopathy
b) The story of my experiment - By M.K. Gandhi with truth
c) Ayurvedic for health and long life- By Dr. R.K. Garde
d) Everybody's guide to Nature cure- By Harry Benjamin
e) Prayer - By M.K. Gandhi
f) Diet and Diet Reforms - By M.K. Gandhi
g) Nature Cure - J.M. Jussawalla
h) Healing from within - J.M. Jussawalla
i) Swartha vritta vijyana - R.H. Singh
j) Fundamentals of Ayurveda - K.N. Udupa
k) Ram narayana vaidya - Arogya Prakash
l) Vaidya Maha birprasad pandy - Chikitsa Tatva Dipika
m) Rampraka shpathak - Padanatha Vijnana
n) Gems of Siddha Medicine - by Dr. Ram Murthy
o) Thirukural - by Valluvar

FUNDAMENTAL PRINCIPLES OF INTEGRATED SYSTEM OF MEDICINE

Subject Title : FUNDAMENTAL PRINCIPLES OF INTEGRATED SYSTEM OF MEDICINE (Duration : 18 Months)

Subject Code : BNYS – T 107A , BNYS– 107B & BNYS – P 107

Subject	Theory	IA	Total	Practical	Viva voce	IA	Total	Grand Total Marks
Fundamental principles of integrated system of medicine -I	80	20	**200**	-	50	-	**50**	**250**
Fundamental principles of integrated system of medicine –II	80	20						

*IA - **Internal Assessment**

GOALS AND OBJECTIVES

Goal:

The goal at giving knowledge about the basics of Ayurveda which are important to identify the cause of disease and guide to follow healthy lifestyle to prevent and treat disease. It also provides a knowledge of History of Ayurveda and in order to be able to study, understand, comprehend and utilize the knowledge contained in Indian traditional texts in their professional practice, especially in the field of Yoga.

Course Objectives:

- Understand origin , history ,important of Ayurveda.
- Understand Principles behind Panchabhoota Siddnatha ,Shareera Vignana ,Swastha Vrittam .
- Understand Fundamental viewpoints of Siddha , Homoeopathy & Unani.

Course Outcomes (Cos) :

At the end of the course, the student will be able to:

- **CO 1 -** Describe the various principles of Ayurveda, Siddha , Homoeopathy & Unani.
- **CO 2 -** Explore the information about various ayurvedic herbs and their use.
- **CO 3 -** Elucidate the history of Ayurveda, Siddha , Homoeopathy & Unani.

THEORY

(SECTION-I) (BNYS – T 107A)

1. Fundamentals of Ayurveda - I

a) Introduction to Ayurved

b) Origin and History of Ayurveda

c) Important works on Ayurveda

d) Astanga of Ayurveda

e) Panchabhoota Siddnatha

f) Shareera Vignana-

i. Sapta Dhatus
ii. Tridosa Vignana,
iii. Mala Vignana,
iv. Ojas,
v. Types of Agnis,
vi. Prakriti Vignana

g) Swastha Vrittam-

i. Dinacharya,
ii. Rastricharya,
iii. Ritucharya,
iv. Vegadharanam,
v. Sadvritta

h) Asta Vidaaharasevana

i) Pathya Apathya vichara

j) Shareera Dharma

2. Fundamentals of Siddha: -

i. History of Siddha,
ii. Basic Principles of Siddha,
iii. Methods of treatment in Siddha practice.

3. Fundamentals of Homoeopathy: -

i. Introduction,
ii. History,
iii. Basic Principles,
iv. Preparation of Homeo medicines,
v. Mother Tincture,
vi. Trituration,
vii. Potency,
viii. Dosage and frequency,
ix. Remedies for day-to-day illness.

4. Fundamentals of Unani : -

i. Introduction,
ii. History,
iii. Basic Principles,
iv. Treatment method

SECTION- II
(BNYS – T 107B)

Fundamentals of Ayurveda - II

a) Sharir Upkrama –
- i. Nirukti of Sharir,
- ii. Aim of Sharir Gyan,
- iii. Preservation of Mrit Sharir

b) Garbh Sharir-
- i. Nirukti/Paribhasha of Garbha,
- ii. Shukra, Artava,
- iii. Development of Garbha

c) Asthi Sharir-
- i. Asthi Sankhaya,
- ii. Asthi Bhed,
- iii. Asthi Swaroopa,
- iv. Asthi Karya

d) Sandhi Sharir-
Sandhi Paribhasha and Bheda

e) Marma Sharir-
- i. Marma Sankhya,
- ii. Marma Classification

f) Tantra Sharir-
- i. Eda,
- ii. Pingla,
- iii. Sushumna,
- iv. Shat Chakra

RECOMMENDED BOOKS:

1. Ayurveda Siddhant Rahasya/ A Practical Approach to Science of Ayurveda – Acharya Balakrishna
2. Ashtang Hridayam – Acharya Balkrishnaji