B.Sc.Hons.
Neuro science
Syllabus

FIRSTSEMESTER

PAPERS CODE	PAPERSNAME	INTERNAL	EXTERNAL	TOTAL
BSHNS101	HumanAnatomy-I	40	60	100
BSHNS102	HumanPhysiology-I	40	60	100
BSHNS103	BasicsofBiochemistry-I	40	60	100
BSHNS104	Pathology-BasicHaematology-I	40	60	100
BSHNS105	Microbiology-I	40	60	100
BSHNS106	English	40	60	100
PRACTICAL				
BSHNS107	HumanAnatomy-ILab	60	40	100
BSHNS108	HumanPhysiology-I Lab	60	40	100
BSHNS109	BasicsofBiochemistry-ILab	60	40	100
BSHNS110	Pathology-BasicHaematology-ILab	60	40	100
BSHNS111	Microbiology-ILab	60	40	100
Total		**540**	**560**	**1100**

SECONDSEMESTER

PAPERS CODE	PAPERSNAME	INTERNAL	EXTERNAL	TOTAL
BSHNS201	HumanAnatomy-II	40	60	100
BSHNS202	HumanPhysiology-II	40	60	100
BSHNS203	BasicsofBiochemistry-II	40	60	100
BSHNS204	Haematology& ClinicalPathology-II	40	60	100
BSHNS205	Microbiology-II	40	60	100
BSHNS206	EnvironmentalStudies	40	60	100
PRACTICAL				
BSHNS207	HumanAnatomy-IILab	60	40	100
BSHNS208	HumanPhysiology-II Lab	60	40	100
BSHNS209	Biochemistry-IILab	60	40	100
BSHNS210	Haematology& ClinicalPathology-IILab	60	40	100
BSHNS211	Microbiology-IILab	60	40	100
Total		**540**	**560**	**1100**

THIRDSEMESTER

PAPERS CODE	PAPERSNAME	INTERNAL	EXTERNAL	TOTAL
BSHNS301	BASICNEUROSCIENCES - I	40	60	100
BSHNS302	BasicsofClinical Neurophysiology and Electroencephalography	40	60	100
BSHNS303	Basicsof Nerve Conductions, ElectromyographyandEvokedPotentials	40	60	100
BSHNS304	Applied TechnologyPartI	40	60	100
BSHNS305	AppliedTechnologyPartII	40	60	100
BSHNS306	Communication Skills	40	60	100
	PRACTICAL			
BSHNS307	Applied TechnologyPartILab	60	40	100
BSHNS308	Applied TechnologyPartIILab	60	40	100
Total		**360**	**440**	**800**

FOURTHSEMESTER

PAPERS CODE	PAPERSNAME	INTERNAL	EXTERNAL	TOTAL
BSHNS401	BASICNEUROSCIENCES II	40	60	100
BSHNS402	Applied Electroencephalography	40	60	100
BSHNS403	AppliedTechnologyIII	40	60	100
BSHNS404	LAW-INDIAN CONSTITUTION	40	60	100
PRACTICAL				
BSHNS405	AppliedTechnologyIIILab	60	40	100
Total		**220**	**280**	**500**

FIFTHSEMESTER

PAPERS CODE	PAPERSNAME	INTERNAL	EXTERNAL	TOTAL
BSHNS501	BASICNEUROSCIENCES III	40	60	100
BSHNS502	Applied Nerve conductions, Electromyographyandevokedpotentials	40	60	100
BSHNS503	AppliedTechnologyIV	40	60	100
BSHNS504	Fundamentalsof Computers	40	60	100
PRACTICAL				
BSHNS505	AppliedTechnologyIV Lab	60	40	100
BSHNS506	FundamentalsofComputersLab	60	40	100
Total		**280**	**320**	**600**

SIXTHSEMESTER

PAPERS CODE	PAPERSNAME	INTERNAL	EXTERNAL	TOTAL
BSHNS601	HumanValuesandProfessionalEthics	40	60	100
BSHNS602	Seminar		200	200
BSHNS603	Project		200	200
Total		**40**	**460**	**500**

SemesterI

PAPERI:HumanAnatomy-I **Theory25Hours**

The humanbodyasa whole:

Definitions,Subdivisions of Anatomy, Terms of location and position, Fundamental Planes, Vertebratestructureofman,Organizationof the Bodycells andTissues.

Locomotionandsupport:

The Skeletal system: Types of bones, structure and growth of bones, Divisions of the skeleton, Appendicular skeleton, Axialskeleton, name of all the bones and their parts, joint- classification, types of movements with examples.

AnatomyoftheNervousSystem:

Centralnervoussystem:Brainand Spinal cord,functions,meninges.

TheBrain-BriefstructureofHindBrain,MidbrainandForebrain,Location,grossfeatures,parts,

functionalareas, cerebralblood circulation and coverings, Functions of peripheral nervous system, OrganizationandStructure ofTypicalSpinalNerve SpinalCord:Gross features,extent,bloodsupply andcoverings,reflex-arc. AppliedAnatomyofspinalcordandbrain.

Anatomyofcirculatorysystem:

Heart:Size,location, externalfeatures, chambers, pericardium and valves,Blood supplyandNerve supply.

RightandLeftAtrium:Structuralfeatures,venousarea,septumandappendages,structuralfeatures inflow and outflow characteristics.

Thestudyofbloodvessels,Generalplanofcirculation,pulmonaryandsystemiccirculation.

Names of arteries and veins and their positions, general plan of lymphatic system. Coronary Circulation,LymphaticdrainageofheartinbriefAppliedaspectsofheartandpericardium.

AnatomyoftheRespiratorysystem:

OrganizationofRespiratorySystem,GrossstructureandinteriorofNose,Nasalcavity,Para nasalair sinuses,

GrossstructureandinteriorofPharynx,Larynx,trachea,bronchialtree,Pleura

Gross structure and Histologyof Lungs, PulmonaryCirculation, PulmonaryArteries, Pulmonary Veins and BronchialArteries.

NerveSupplyofRespiratorySystemandAppliedaspectofRespiratorySystem.

PAPERIV: Anatomy

1. GeneralHistologySlides:
   - EpithelialTissue,
   - ConnectiveTissue,
   - HyalineCartilage,
   - Fibro Cartilage,
   - ElasticCartilage,
   - T.S.&L.S.ofBone,
   - Blood Vessels,
   - Tonsil,
   - Spleen,
   - Thymus,
   - Lymphnode,
   - SkeletalandCardiacMuscle
   - PeripheralNerveandOpticNerve
2. SystemicHistologySlides:
   - RS-LungsandTrachea
   - Cerebrum
3. Demonstrationofallbones-Showingparts,joints,
4. X-raysofallnormalbonesandjoints.
5. Demonstrationof heartandnormalangiograms.
6. DemonstrationofBrain
7. Demonstrationofdifferentpartsofrespiratorysystemandnormal X-rays

SuggestedReadings:

NameoftheBooks&Title	Author	Publisher's Name, PlaceofPublication
1. Human Anatomy RegionalandApplied. Vol. 1, Vol.2 & Vol.3	B.D.Chaurasia	C.B.S.Publishers,NewDelhi

2.HandBookofGeneral Anatomy	B.D.Chaurasia	C.B.S.Publishers,NewDelhi
3.TextbookofHistology- A Practical Guide	J.P.Gunasegaran	ElsevierPublication,Gurgaon, Hariyana
4.PracticalmanualofHistology for Medicalstudents	NeelkanthKote	JaypeeBrothers,MedicalPublishers, Delhi.

SemesterI

PAPER2:SectionA-HumanPhysiology-I **Theory35Hours**

General Physiology: Structure of Cell membrane and Cell Organelles, Intercellular junctions, Classification of Body fluid compartments & composition, Homeostasis, Transport across cell membrane -Definition and Classification

NerveMusclePhysiology: DefinitionofRestingMembranePotential,ActionPotential-Phases& ionicbasis,Classification and structure of NervousTissue, Structure, Classification and Properties of Skeletal Muscle, Neuromuscular Junction - Definition, Structure and Mechanism of neuromusculartransmission,Myastheniagravis,ExcitationContractionCoupling.

Blood: Composition andfunctions ofblood and plasmaproteins
Red Blood Cells: Morphology & functions, Erythropoiesis, types & functions of hemoglobin, DefinitionandClassificationofAnemia&Jaundice.Whitebloodcells:Morphology,functionsDefini- tion of Leucopoiesis, Immunity - definition, and classification, Platelets and Blood Coagulation: Morphology & functions of platelets, Mechanism of Hemostasis, Anticoagulants, Bleeding disorders.BloodGroups:Classificationof BloodGroups,ABOandRhbloodgroupsystems,usesof bloodgroupingtestandCrossmatching,BloodTransfusionanditshazards.

CentralNervousSystem:
Organizationof CNS:Introduction,Structureof neuron, Properties of nervefiber,AxonalTrans- port, Classification of nerve fibers.

Synapse,Receptor &Reflex: Definitionof synapse, receptor &reflex, Classificationof Synapse, Structure & properties of synapse, Classification of receptor, adaptation, properties of receptor, Components of reflex arc, classification of reflex.

The sensory system: Overview of sensory system, Structure of Spinal Cord, Ascending tracts - Anterior Column,LateralColumnandPosterior ColumnTract-Course,terminationandfunction

The motor system : Overview of motor system, cortical motor areas, pyramidal and extra pyramidal, tract- Course, termination and function, Upper & Lower Motor Neuron, Lumbar Puncture.

Functions of Various parts of Brain:Cerebellum, Basal ganglia, Hypothalamus, Thalamus, Autonomic Nervous System

TemperatureRegulation:Normaltemperatureofbody,Regulationofbodytemperature&Fever

SpecialSenses:

Vision: Structure of Eye, Functions of rods and cones, accommodation, visual pathway, near, distant & colour vision, light & dark adaptation, Refractory errors of eye & correction.

Hearing: Structureandfunctionsofexternal,middleandinnerear,Mechanism&TestsofHearing

Taste, Olfaction and Skin: Taste buds, papillae's, taste pathway, Olfactory mucosa, Olfactory Pathway,Adaptation of smell, unique features of olfaction, structure & functions of skin.

SuggestedReadings:

RecommendedTextBooks(LatestEdition)

Sl.No.	NameoftheBook&Title	Author	Publisher's Name, PlaceofPublication
1	TextbookofPhysiologyforMLT	ProfA.K.Jain	AvichalPublishingCompany
2	TextbookofMedicalPhysiology	D.Venkatesh&H.H. Sudhakar	WoltersKluwers
3	ConciseMedicalPhysiology	SujitK.Choudhari	NewCentralBooks,Calcutta
4	TextbookofPhysiology	ArthurC.Guyton	PrismPublishers,Bangalore
5	PracticalPhysiology	Prof.A.K.Jain	AryaPublication

Practical1:SectionA-Physiology

StudyofMicroscope andits use

1) CollectionofBloodandstudyofHaemocytometer
2) Haemoglobinometry
3) WhiteBloodCellcount
4) RedBloodCellcount
5) DeterminationofBloodGroups
6) Leishman'sstainingandDifferentialWBCCount
7) DeterminationofBleedingTime
8) DeterminationofClotting

SemesterI

PAPER2:SectionB:BasicsofBiochemistry-I

1. **Introduction to Medicallab Technology:**
   (a)RoleofMedicallabTechnologist(b)Ethics,Responsibility(c)Safetymeasures
   (d)First aid(e)Cleaningandcareofgenerallaboratoryglasswareandequipment.
2. **IntroductiontoApparatus-ChemicalBalance:**Differenttypes,Principlesandapplications.
3. **UnitsofMeasurements:**ConceptsofMolecularweight,Atomicweight,Normality,Molarity, Standards, Atomic structure, Valence, Acids, Bases, Salts & indicators
4. **ConceptsofpH:**ConceptsofAcidBasereactionandhydrogenionconcentration.Definition of pH, buffer & pH meter
5. **ChemistryofCarbohydrates:**
   a. Definition,Classificationandbiologicalimportance.
   b. Monosaccharaides,Oligosaccharides,Disaccharides&Polysaccharides:
6. **ChemistryofLipids:**
   a. Definition,Classificationandbiologicalimportance.
   b. Simplelipids:Triacylglycerolandwaxes-compositionandfunctions.
   c. Compoundlipids:Phospholipids,Sphingolipids,GlycolipidandLipoproteins: Composition andfunctions.
   d. Derivedlipids:Fattyacids-saturated&unsaturated.Steroidsandtheirproperties.
7. **ChemistryofProteins:**
   a. Aminoacids:Classification,properties,sidechainsofaminoacids.
   b. Protein:Definitions,Classificationsandfunctions.
   c. Peptides:Biologicallyactivepeptides
   d. OverviewofStructuralorganizationofproteins.
   e. Denaturationofproteinsanddenaturatingagents
8. **ChemistryofNucleicacids:**
   a) DNAStructureandfunction
   b) RNA:Types,Structure(onlytRNA)andFunctions.

SuggestedReadings:

Sl.No.	NameoftheBooks&Title	Author	Publisher's Name, PlaceofPublication
1	TestBookofBioChemistry forMedicalStudents	Vasudevan(DM),&Sree Kumari(S)	JaypeeBrothers,NewDelhi.
2	Biochemistry	U.Satyanarayan	BooksandAllied(P)Ltd. Kolkata-700009.India)
3	ClinicalChemistry	Varley	WilliamHeinemannMedical Books Ltd & Inter Science Book.Inc. New York.
4	ClinicalChemistry	TEITZ	W.B.SaundersCompany Harcourt (India) Private LimitedNewDelhi-110048.

PAPER2:SectionB-BiochemistryPracticals **Practical30Hours**

1. Introductiontoapparatus,InstrumentsanduseofChemical Balance.
2. MaintenanceofLaboratoryGlasswareandapparatus.
3. ReactionsofCarbohydrates(Glucose,fructose,maltose,lactose,sucroseandstarch)
4. ReactionsofProteins(AlbuminandCasein)
5. Colourreactionsof Proteins
6. IdentificationofUnknownCarbohydratesandproteins

SemesterI

PAPER 3 : Section A – Pathology-I **Theory25Hours**

BasicHaematology

- IntroductiontoHaematology:(a)Definition(b)Importance(c)Importantequipmentused.
- Laboratoryorganizationandsafetymeasuresinhaemotologylaboratory
- Introductiontoblood,itscomposition,functionandnormalcellularcomponents.
- Collectionandpreservationofbloodsampleforvarioushaematologicalinvestigations
- NormalValuesinHematology
- Preparationof bloodFilms-Types.Methodsof preparation(Thickandthinsmear/film)
- Definition,principles&procedure,Normalvalues,Clinicalsignificance,errorsinvolved, means tominimize errors for thefollowing:
  1. Haemoglobinometry,PCV,RedCellIndices
  2. Totalleucocytescount(TLC)
  3. Differentialleucocytescount(DLC),AbsoluteEosinophilcount,Reticulocytecountand PlateletCount.
  4. ErythrocyteSedimentationRate(ESR)
  5. BloodGrouping
- StainingtechniquesinHaematology(Romanowsky'sstains):Principle,composition, preparationofstainingreagentsandprocedureofthefollowing
  1. Giemsastain
  2. Leishmanstain
  3. Wright'sstain
  4. Field'sstain
- BoneMarrow:Techniquesofaspiration,PreparationandStainingoffilms,BoneMarrowBiopsy.

SuggestedReadings:

Referencebooks(LatestEdition)

Sl. No.	NameofBook&title	Author	Publisher, Name, Placeofpublication
1	PracticalPathology	P. Chakraborty GargiChakraborty	NewCentralBookAgency, Kolkotta
2.	TextBookofHaematology	Dr.TejinderSingh	AryaPublications,Sirmour(H.P)
3.	Text Book of Medical LaboratoryTechnology	PrafulGodkar	BhalaniPublicationHouse, Mumbai
4.	PracticalHaematology	SirJohnDacie	ChurchillLivingstone,London
5.	Todd & Sanford, Clinical Diagnosis&Management byLaboratoryMethods	JohnBernardHenry	AllIndiaTravellarBooksellar, Delhi.
6.	PracticalPathology	Dr.GangaS.Pilli	PrabhuPublications,Dharwad

Practical 3 : Section A – Pathology-I **Practical30Hours**

BasicHaematology

1. HbEstimation-Sahli'smethod&Cyanmethhaemoglobinmethod
2. RBCCount
3. ReticCount
4. Preparation ofbloodsmearsandstainingwithLeishmanstain
5. WBCCount
6. WBC-DifferentialCount
7. PlateletCount
8. AbsoluteEosinophilCount
9. ESR-Westergreens&Wintrobe'smethod,
10. PCV.
11. Sicklingtest-Demonstration
12. BoneMarrowSmearpreparation&stainingprocedure-Demonstration
13. DemonstrationofMalarialParasite.

SemesterI

PAPER3:SectionB-Microbiology **Theory25Hours**

- **IntroductiontoMedicalMicrobiology:**-Definition-History-Host-Microberelationship.
- **Microscopy:**-Introductionandhistory-Typesof microscopes

  (a) Lightmicroscope
  (b) DarkgroundMicroscope
  (c) FluorescentMicroscope
  (d) PhasecontrastMicroscope
  (e) Electronmicroscope:
  -Principlesandoperational mechanisms ofvarioustypesofmicroscopes
- **Sterilization:**-Definition--Typesandprincipleofsterilizationmethods
- **Physicalmethods-**(a)Heat(dryheat,moistheatwithspecialReferencetoautoclave - theircareandmaintainance.)(b)Radiation(c)Filtration,Efficiencytestingtovarioussterilizers.
- **Chemicalmethods**
- **Antisepticsanddisinfectants:**Definition,Typesandproperties-Modeofaction-Usesof various disinfectants, Precautions while using the disinfectants - Qualities of a good disinfectant, In-house preparation of alcoholic hand/skin disinfectants, Testing efficiencyof variousdisinfectants
- Antibioticsanddrugresistance
- ClassificationofMicrobes
- BacterialCellGrowthandNutrition
- OverviewandmechanismsofBacterialgenetransfer.
- Ubiquityofmicrobes.

SuggestedReadings:

1. AnanthanarayanandPaniker'sTextbookofMicrobiology.TenthEdition.RebaKanungo
2. TextbookofMicrobiologyforMLT.SecondEdition.Dr.C.P.Baveja.

Practical3:SectionB-Microbiology

- Focusing,handlingandcareofMicroscopes
- Hangingdrop
- Simplestain
- Gramstain
- ZNstain
- SterilizationandDisinfection.

SuggestedReadings:

- PracticalMicrobiology,FourthEdition.C.PBaveja.

IYEARB.Sc.BNTENGLISH

COURSECONTENTS:

Subsidiarysubject60hoursfor1st yearmarkstobesenttouniversitybeforeIInd yearexam.Course description:ItisdesignatedtohelpthestudentstoacquireagoodcommandoverEnglishlanguage forcommonandmedicalterminologyusedinmedicalpractice.

Behaviouralobjectives:

AbilitytospeakandwriteproperEnglish

Ability to read and understand English

Abilitytounderstandandpracticemedicalterminology. Paragraph

Letterwriting

Notemaking

Description

Theuseofparagraphs

Essay writing

Telegrams

Precise-writingandabstracting

Reportwriting

MedicalTerminology

Use of dictionary

TextBooksRecommended(LatestEdition)

Sl. No.	NameoftheBook&Title	Author	Publisher's Name PlaceofPublication
1.	SharmaStrengthenyourwriting	V.R.Narayana	NewDelhi,Orient Longman
2.	Grammerandcomposition	WrenandMartin	Delhi,Chand &Co.
3.	SpokenEnglish	ShashikumarV. D'Souza P. V.	NewDelhi, TataMergawHill
4.	Medicaldictionary	Dorland's pocket IBHPublishingCo.	NewDelhi;Oxford&

SemesterII

PAPER1:HumanAnatomy-II **Theory40Hours**

AnatomyoftheDigestiveSystem:

Components of Digestive system, Alimentary tube, Anatomy of organs of digestive tube, mouth, tongue, tooth, salivary glands, liver, Biliary apparatus, pancreas, Names and positions and brief functions - with its applied anatomy.

AnatomyofRenalSystem.

Organizationof renalsystem

Kidneys:Location,grossfeatures,relations,structure,bloodsupply,nervesupply,lymphatic drainage and with its applied anatomy.

Uretersandurinarybladder-Location,grossfeatures,structureandwithitsappliedanatomy Urethra in brief along with its applied anatomy.

AnatomyofReproductiveSystem.

MaleReproductiveSystem:Testis,Ductsystem-withitsappliedanatomy.

FemaleReproductive System: Uterus,Ovaries, Duct system,Accessoryorgans- withits applied anatomy.

AnatomyoftheEndocrineSystem.

Nameofallendocrineglandstheirpositions,Hormonesandtheirfunctions-Pituitary,Thyroidand parathyroid glands, Adrenal glands, Gonads and Endocrine part of pancreas- with its applied anatomy.

SuggestedReadings:

NameoftheBooks &Title	**Author**	**Publisher's Name, PlaceofPublication**
1. Human Anatomy RegionalandApplied. Vol. 1, Vol.2 & Vol.3	B.D.Chaurasia	C.B.S.Publishers,NewDelhi.
2. Text Book of HumanHistology	InderbirSingh	JaypeeBrothers,Medical Publishers, Delhi.
3.ClinicallyOriented Anatomy	KeithL.Moore	WilliamsandWilkins, Baltimore.
4.Gray'sAnatomy	SusanStandring	ElsevierChurchillLivingstone, Edinburg
5.Textbook ofHistology -APracticalGuide	J.P.Gunasegaran	ElsevierPublication,Gurgaon, Hariyana.
6.Practicalmanualof HistologyforMedicalstudents	NeelkanthKote	JaypeeBrothers,Medical Publishers, Delhi.

Practical 1: Human Anatomy **Practicals-20Hours**

SystemicHistologyslides:

1. G.I.T-oesophagus,stomach,smallintestine,largeintestine,liver,pancreasandgallbladder.
2. Kidney,ureterandurinarybladder.
3. Endocrineglands-Adrenal,Pancreas,Pituitary,ThyroidandParathyroid
4. Uterus,Ovary,Testis.

Practical:

1) Demonstrationofthe digestivesystemorgans

2) Demonstrationofexcretorysystemsorgans

3) DemonstrationofMale&Femalereproductiveorgans
4) DemonstrationofEndocrineglands.

PAPER 2 : Section A - Physiology-II **Theory35Hours**

RespiratorySystem

PhysiologicalAnatomyofRespiratorySystemandFunctions,DeadSpace.

MechanismofRespiration,Lungvolumeandcapacities,Surfactant,definitionofcompliance

TransportofOxygen,ODCCurveand**CO_2transport.**

RegulationofRespiration-TypesandfunctionsofRespiratoryCentres

Cyanosis, Dyspnea,Apnea,Hypoxia **-** definitionandtypes.

Cardiovascular System

Physiological Anatomy of Heart

CardiacCycle-DefinitionandPhases

CardiacOutput-Definition,andfactorsaffectingcardiacoutput,

Bloodpressure-Definition,Determinants&Factorsaffectingbloodpressure,regulationofblood pressure,

DefinationHypertension,HypotentionMyocardialIschemiaandInfarction.

NormalElectrocardiogram-Definition,WavesandUses

ExcretorySystem

Functional Anatomy: Functional anatomy of kidneys, structure of a nephron, features of renal circulation, juxtaglomerular apparatus

MechanismofUrineformation: GlomerularFiltration-Definition,glomerularfiltrationrate,factorseffectingGFR,Tubularreabsorption,functionsofProximalconvolutedtubule,loopofHenle, distal convoluted tubule & collecting tubule.

Micturation: Musclesofthebladder,nervesofbladder,micturitionreflex,&conceptofArtificialKidney

DigestiveSystem

Functional Anatomy of GIT, composition & functions of saliva

Compositionofgastricjuice,mechanism ofsecretion&functionofHCL

Composition andfunctions of pancreatic juice

Functions of Liver and bile Juice

DefinationofJaundiceandittypes

MovementsofGI Tract-Deglutition, MovementsofSmallIntestines

Endocrines

MajorEndocrineglands

- PituitaryGland:Anterior&PosteriorPituitaryHormonesandfunctions
- ThyroidGland:HormonesSecretedandFunctions,Goitre
- AdrenalGland:Hormonessecretedbyadrenalcortexandmedullaandtheirfunctions
- Pancreas:EndocrineHormonesofPancreasandtheirfunctions,DiabetesMellitus
- ParathyroidGland:PTH,calcitoninanditsactions

ReproductiveSystem

Puberty: Puberty,Pubertalchanges inmaleandfemale.

MaleReproductiveSystem: Malereproductiveorgans,Spermatogenesis,Morphologyofasperm, Semen,Factorsinfluencingspermatogenesis,Functionsoftestosterone

FemaleReproductiveSystem: Femalereproductiveorgans,Oogenesis,Ovulatorycyclewithits hormonalbasis,TestsforOvulation,Menstrualcyclewithitshormonalbasis,FunctionsofEstrogen &Progesterone

Pregnancy&Lactation: Fertilization,FunctionsofPlacenta,HormonesofPlacenta,Pregnancy tests,Contraceptivemethods,Milk EjectionReflex,CompositionofMilk,Advantagesofbreastfeeding.

Recommended Text Books (Latest Edition)

Sl.No.	NameoftheBook&Title	Author	Publisher's Name, PlaceofPublication
1	TextbookofPhysiologyforMLT	ProfA.K.Jain	AvichalPublishingCompany
2	TextbookofMedicalPhysiology	D.Venkatesh& H.H.Sudhakar	WoltersKluwers
3	ConciseMedicalPhysiology	SujitK.Choudhari	NewCentralBooks,Calcutta.
4	TextbookofPhysiology	ArthurC.Guyton	PrismPublishers,Bangalore.
5	PracticalPhysiology	Prof.A.K.Jain	AryaPublication.

Practical2:Section A-HumanPhysiology

1) RecordingofPulse
2) BloodPressureRecording
3) EffectofExerciseonBP
4) EffectofPostureonBP
5) AuscultationforHeartSounds
6) Spirometry-DescriptionofNormalFindings
7) Electrocardiogramofanormalperson-DescriptionofECGwavesinLeadII
8) ArtificialRespiration.

PAPER2:SectionB-BasicsofBiochemistry-II **Theory35Hours**

1. Specimencollection of blood,urine,cerebrospinalfluidand otherbodyfluids,preservation and preparation of protein free filtrate.
2. Enzymes: definition, classification, coenzymes, factors affecting enzyme activity and inhibitors,unitsofmeasurements,isoenzymes,Diagnosticenzymology(AST,ALTALP,LDH, CPKandTroponin).
3. DigestionandAbsorptionofCarbohydrates,proteinsandlipids
4. Nutrition-CalorificvalueandnutritionalimportanceofCarbohydrates,Lipids,ProteinsandDi-etary fibers. BMR & Factors affecting BMR
5. Vitamins-Sources,RDA,functionsanddeficiencymanifestations.
6. Minerals-Calcium, Phosphorus,Iron,copper,zinc,seleniumandfluoride
7. NonProteinNitrogenouscompounds-ClinicalSignificanceofUrea,Uricacid,creatinine, acetoneandHCL
8. OverviewofMetabolism

   CarbohydrateMetabolism-Glycolysis,GluconeogenesisandTCACycle

   ProteinMetabolism-GeneralReactionsofaminoacidsandUreacycle.

SuggestedReadings:

1	TestBookofBioChemistry forMedicalStudents	Vasudevan(DM),&SreeKumari(S)	JaypeeBrothers,NewDelhi.
2	Biochemistry	U.Satyanarayan	BooksandAllied(P)Ltd. Kolkata-700009.India)
3	ClinicalChemistry	Varley	WilliamHeinemannMedicalBooksLtd & Inter Science Book.Inc. NewYork.
4	ClinicalChemistry	TEITZ	W.B.SaundersCompanyHarcourt (India)Pvt.Ltd.NewDelhi-110048.

Practical2:BasicsofBiochemistry **Practical-30hours**

1. DemonstrationofColorimeter,spectrophotometer,pHmeter.
2. QuantitativeanalysisofGlucose,Ureaandcreatinine
3. Estimationofurinecreatinine
4. Biochemicallyimportantsubstance-Urea,Uricacid,Creatinine,AcetoneandHCL

PAPER 3 : Section A - Haematology & Clinical Pathology-II **Theory25Hours**

Hematology:

1. Bonemarrow
   a. Techniquesof aspiration,preparationandstaining offilms
   b. Bonemarrowbiopsy
2. Preparationofbuffycoatsmears
3. Laboratorytestsusedintheinvestigationofanemia's
   a. B12andfolateassayNormalvalues,derangementsandinterpretationofresults.
   b. Schillingtest-Methodandinterpretation
   c. SerumironandironbindingcapacityandothertestsforIrondeficiencyanemia-Normal values, derangements and interpretation of results
4. Laboratorytestusedininvestigationofhemolyticanemia's
   a. Osmoticfragility
   b. InvestigationofG-6PDdeficiency
   c. Testforsickling
   d. EstimationonofHb-F,Hb-A2
   e. PlasmahaemoglobinandHaptoglobin,demonstrationofhaemosiderininurine
   f. Haemoglobinelectrophoresis
   g. Coomb'stest(Direct&Indirect)-TestforautoimmunehemolyticAnaemias.

ClinicalPathology

1. Urineexamination
   Physical,Chemical&Microscopic
2. Semenanalysis

BLOODBANKING
(BloodtransfusionandImmunohaematology).

1. Collection&processingofBlood–Donorselection,Registration,Medicalhistory, Physicalexamination.
2. CollectionofBlood
3. ProcessingofDonorBlood
4. Storage&preservationofBlood.
5. ABOBloodgroupSystem
6. R.htypingandweakervariantsinR.hsystem
7. SubgroupandweakervariousofAandBandBombayPhenotype
8. PreparationsandstandardizationofAntiHumanglobulinreagent
9. Coomb’stest.
10. Bloodgroupingandcross-matchinginbloodbank.
11. DiseasestransmittedbyBloodandtheirscreening-AustraliaAntigenandHepatitis C.Virus(HCV),HIV,Syphilis,CMV&MalariainBloodtransfusion
12. Investigationoftransfusionreaction.
13. HLAAntigensandtheirsignificanceinbloodtransfusion.
14. BloodComponents-itspreparationandtheiruseinclinicalpractice.
15. Haemapheresis-ApheresisusingcellseparatorsLeucapheresis,plateletpheresis, plasmapheresisAdverse effects on donors.
16. BloodBankAdministration.
17. Recordkeeping

Immuno-cytochemistry:

1. Introduction
2. Basicconceptsofimmunochemistry
3. Monoclonalantibodiesandtheirpreparations
4. Fluorescencereactions
5. PAPTechnique-principle,preparationofreagentsandProcedure.

SuggestedReadings:

Referencebooks(LatestEdition)

Sl. No.	NameofBook&title	Author	Publisher, Name, Placeofpublication
1	PracticalPathology	P. Chakraborty GargiChakraborty	NewCentralBookAgency, Kolkotta
2.	TextBookofHaematology	Dr.TejinderSingh	AryaPublications,Sirmour(H.P)
3.	Text Book of Medical LaboratoryTechnology	PrafulGodkar	BhalaniPublicationHouse, Mumbai
4.	PracticalHaematology	SirJohnDacie	ChurchillLivingstone,London
5.	Todd & Sanford, Clinical Diagnosis&Management byLaboratoryMethods	JohnBernardHenry	AllIndiaTravellarBooksellar, Delhi.
6.	PracticalPathology	Dr.GangaS.Pilli	PrabhuPublications,Dharwad.
7.	HematologyBloodBanking &Transfusion(PB)	DuttaB.A.	CBSPublishers&Distributors Pvt.Ltd.
8.	BloodTransfusionin ClinicalPractice(HB)	KochharP.K.	CBSPublishers&Distributors Pvt.Ltd.
9.	TransfusionMedicine, 3e(PB)	McCullough	CBSPublishers&Distributors Pvt.Ltd.
10.	PracticalTransfusion Medicine,4e (HB)	Murphy	CBSPublishers&Distributors Pvt.Ltd.

Practical3:PathologyPracticals **Practical35Hours**

I. HAEMATOLOGY

- Sicklingtest-Demonstration
- BoneMarrowSmearpreparation&stainingprocedure-Demonstration
- DemonstrationofMalarialParasite.
- Bloodgrouping.,Crossmatching,BloodTransfusionandimmunohaematology.
- Coomb'sTest(Demonstration).

II. CLINICAL PATHOLOGY

- Visittopathologylaboratory–Postingsinbatches-15daysfor2hours
- Urineexamination
  - Physical
  - Chemical–Reducingsubstancesketonebodies,proteinsandblood
  - Microscopy
  - Dipstickmethod–Demonstration
  - SemenAnalysisDemonstration

PAPER3:SectionB-Microbiology-II **Theory25Hours**

- Culturemediaanddifferentmethodsofcultivation.
- **Immunology**–Introduction,Specific andnon-specific immunity, Antigens, Antibodies – Structureandfunction,Complementandantigen-antibodyreaction.

SuggestedReadings:

1) AnanthanarayanandPaniker'sTestbookofMicrobiology.TenthEdition.RebaKanungo

2) TextbookofMicrobiologyforMLT.SecondEdition.Dr.C.P.Baveja.

Practical3:SectionB-Microbiology

- Biomedicalwastemanagement
- Collectionofvariousclinicalspecimens.
- Serologicaltests
- Un-inoculatedculturemediaandculturetechniques.

ENVIRONMENTALSTUDIES

GOAL:

Thestudentsshouldgainknowledgetounderstandthemultidisciplinarynatureoftheenvironment andtheawarenessoftheecosystem,whichmaintainsthenaturalenvironment.

OBJECTIVES:

a) KNOWLEDGE

AttheendoftheIIPhase1sttermMBBSCoursethestudentisexpectedtoknow:

1. Thenaturalresourceslikeforest,water,mineral,food,energyandland.
2. Functionsoftheecosystem.
3. Bio-diversityanditsconservation.
4. Environmentalpollution&itsprevention.
5. Socialissues.

b) SKILLS

AttheendoftheIIPhase1sttermMBBSCoursethestudentisexpectedto:

1. Visitlocalareastounderstandanddocumentenvironmentalassetslikeriver,forest, grassland, hill and mountain.
2. Visitanindustrialareaoragriculturalareatoknowaboutlocalpollutants.
3. Identifycommonplants, insectsand birdsintheirlocalareas.
4. Identifyrivers,hillsandmountainsintheirlocalareas.
5. Tomakeuseoftheknowledgetoprotectnaturalresources.

COURSECONTENTS

TheoryandFieldwork:50Hours

- **Theory -45hours**
- **Fieldwork-5hours**

1:Multi-disciplinarynatureofenvironmentalstudies

Definition,scopeandimportance,needforpublicawareness. **2hours**

2:NaturalResources:

Renewableandnon-renewableresources:

Naturalresourcesandassociatedproblems.

a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction,mining,damsandtheireffectsonforestandtribalpeople.

b) Waterresources:Useandover-utilizationofsurfaceandgroundwater,floods,drought, conflictsoverwater,dams-benefitsandproblems.

c) Mineralresources:Useandexploitation,environmentaleffectsofextractingandusingmin- eral resources, case studies.

d) Foodresources:Worldfoodproblems,changescausedbyagricultureandovergrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

e) Energyresources:Growingenergyneeds,renewableandnonrenewableenergysources, use of alternate energy sources. Case studies.

f) Landresources:Landasaresource,landdegradation,maninducedlandslides,soil erosion anddesertification.

g) Roleofanindividualinconservationofnaturalresources.

h) Equitableuseofresourcesforsustainablelifestyles **8hours**

3:Ecosystems

- Conceptofanecosystem.
- Structureandfunctionofanecosystem.
- Producers,consumersanddecomposers.
- Energyflowintheecosystem.
- Ecologicalsuccession.
- Foodchains,foodwebsandecologicalpyramids.
- Introduction,types,characteristicfeatures,structureandfunctionofthefollowing ecosystems:-

a. Forestecosystem
b. Grasslandecosystem
c. Desertecosystem

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) **6 hours**

4:Biodiversityanditsconservation **8hours**

- Introduction -Definition:genetic, speciesandecosystemdiversity.
- BiogeographicalclassificationofIndia.
- Valueofbiodiversity:consumptiveuse,productiveuse,social,ethical,aestheticand optionvalues.
- Biodiversityatglobal,Nationalandlocallevels.
- Indiaasamega-diversitynation.
- Hot-sportsofbiodiversity.
- Threatstobiodiversity:habitatloss,poachingofwildlife,man-wildlifeconflicts.
- EndangeredandendemicspeciesofIndia
- Conservationofbiodiversity:In-situandEx-situconservationofbiodiversity.

5:EnvironmentalPollution **8hours**

Definition

- Cause,effectsandcontrolmeasuresof:-

a. Airpollution
b. Waterpollution
c. Soilpollution
d. Marinepollution
e. Noisepollution
f. Thermalpollution
g. Nuclearhazards

- SolidwasteManagement:Causes,effectsandcontrolmeasuresofurbanandindustrial wastes.
- Roleofanindividualinpreventionofpollution.

- Pollutioncasestudies.
- Disastermanagement:floods,earthquake,cycloneandlandslides.

6:SocialIssuesandtheEnvironment **7hours**

- FromUnsustainabletoSustainabledevelopment
- Urbanproblemsrelatedtoenergy
- Waterconservation,rainwaterharvesting,watershedmanagement
- Resettlementandrehabilitation ofpeople;itsproblemsandconcerns.CaseStudies
- Environmentalethics:Issuesandpossiblesolutions.
- Climatechange,globalwarming,acidrain,ozonelayerdepletion,nuclearaccidentsand holocaust. Case Studies.
- Wastelandreclamation.
- Consumerismandwasteproducts.
- EnvironmentProtectionAct.
- Air(PreventionandcontrolofPollution)Act.
- WildlifeProtectionAct
- ForestConservationAct
- Issuesinvolvedinenforcementofenvironmentallegislation.

7:HumanPopulationandtheEnvironment **6hours**

- Populationgrowth,variationamongnations.
- Populationexplosion-FamilyWelfareProgramme.
- Environmentandhumanhealth.
- HumanRights.
- ValueEducation.
- HIV/AIDS
- WomenandChildWelfare.
- RoleofInformationTechnologyinEnvironmentandhumanhealth.
- CaseStudies.

8:Fieldwork

- Visittoalocalareatodocumentenvironmentalassetsriver/forest/grassland/hill/mountain
- Visittoalocalpollutedsite-Urban/Rural/Industrial/Agricultural.
- Studyofcommonplants,insects,birds.
- Studyofsimpleecosystems-pond,river,hillslopes,etc.(FieldworkEqualto5lecturehours)

RecommendedBooks

Sl. No.	Title	Author	Edition &Year	Publisher
1	EnvironmentalBiology	Agarwal,K.C.	2001	NidiPublicationLtd. Bikaner
2	TheBiodiversity ofIndia	Bharucha Erach		MapinPublishingPvt.Ltd., Ahmedabad - 380013
3	Environmental Encyclopedia	CunninghamW.P., CopperT.H., Gorhani E. & HepworthM.T.	2001	JaicoPublicationHouse, Mumbai.
4	GlobalBiodiversity Assessment	HeywoodV.H.& WastonR.T.	1995	CambridgeUniversity Press1140p
5	Environmental ProtectionandLaws	Jadhav H. &BhosaleV.M.	1995	HimalayaPublishing House,Delhi284p
6	EnvironmentalScience Systems & Solutions	MckinneyM.L.& SchoolR.M.	1996	

SemesterIII

PAPER I

BASICNEUROSCIENCES-I

Paper I:

- Brain: Cerebrum: Lobes, Areas and their functions, Basal Ganglia, Thalamus, Cerebellum and Brain Stem
- SleepandConsciousness
- SpinalCord:Structure,Tracts,BloodSupply
- CranialNerves(specialemphasisonoptic,trigeminal,facialandvestibulocochlear nerves).
- Spinalrootsandperipheralnerves
- Brachialplexus
- LumbosacralPlexus
- AnatomyofIndividualNerves:Median,Ulnar,Radial,Sural,CommonPeroneal, PosteriorTibial
- Muscles:Facialmuscles,UpperlimbmusclesandLowerlimbmuscles
- NeuromuscularJunction
- Visualpathway
- Motorpathway
- Auditorypathway
- Somatosensorypathways
- Motorunit
- Autonomicnervoussystem
- Musclestretchreflex
- Musclecontraction
- Membranepotential
- Ionchannels
- Neurotransmitters

Schemeof Examination

Type of Questions & Topics	Questions to be asked	Questions to be answered	Marks
Long Essay Questions preferably from ♦ Somatosensory Pathways ♦ Neuromuscular Junction ♦ Auditory Pathway ♦ Visual Pathway ♦ Brachial plexus ♦ Lumbosacral plexus	2	2	20
Short Essay Questions Topics not covered in long questions	5	5	25
Short Answer Questions Topics not covered in long questions	5	3	15
		Total Marks	**60**

PAPERII

Theory 30Hours

BasicsofClinicalNeurophysiologyandElectroencephalography

1. BasicPrinciples
    - Patientpreparation
    - ElectricalSafety
    - ElectricalGroundanditsmaintenance
    - Electrodes
    - Amplification
    - Signalprocessing
    - Analogtodigitalconversion
    - Samplingrate
    - Filters:HighFrequencyandLowfrequency
    - TimeConstant
2. Electroencephalography
    - Principlesof EEG Recording
    - EEGrecordingTechniques
    - ElectrodePlacement: 10–20 Systemand10–10System

- T1andT2 Electrodes
- Sphenoidalelectrodes
- NormalEEG:AwakeEEGandEEGduringsleep
- ArtifactsinEEGRecording
- VideoEEG

3. Dataacquisition&Storage
4. Impedance
5. Averaging
6. Calibration
7. CommonModeRejectionRatio
8. Triggering–Principlesandapplications
9. SignalDelay

Schemeof Examination

Type of Questions & Topics	Questions to be asked	Questions to be answered	Marks
Long Essay Questions preferably from ♦ Principles of EEG recording ♦ EEG recording techniques ♦ Normal EEG in awake period ♦ Normal EEG during sleep ♦ Artefacts in EEG	2	2	20
Short Essay Questions Topics not covered in long questions	5	5	25
Short Answer Questions Topics not covered in long questions	5	3	15
		Total Marks	**60**

PAPERIII

Theory30Hours

BasicsofNerveConductions,ElectromyographyandEvokedPotentials

1. **NerveConductions**
   - PrinciplesofNerveConduction
     - Motornerveconductions:Median,ulnar,commonperonealand posterior tibial nerves
     - Sensorynerveconductions:Median,ulnar,superficialperonealand sural nerves
   - **Lateresponses**
     - H–reflex
     - F – response
2. **RepetitiveNerveStimulation**
3. **AutonomicNervousSystem**
     - Sympatheticskinresponse
     - Heartratevariability
     - Electrocardiogram
4. **Electromyography**
   - PrinciplesofElectromyography
   - ElectrodesforElectromyography
   - Qualitative Electromyography
   - Motorunitactionpotential
   - Interferencepattern
5. **EvokedPotentials**
   - PrinciplesofEvokedPotentials
   - Averaging
   - VisualEvokedPotentials
   - AuditoryEvokedPotentials
   - SomatosensoryEvokedPotentials

Schemeof Examination

Type of Questions & Topics	Questions to be asked	Questions to be answered	Marks
Long Essay Questions preferably from ♦ Principles of motor nerve conductions ♦ Principles of Sensory nerve conductions ♦ Auditory evoked potentials ♦ Visual evoked potentials	2	2	20
Short Essay Questions Topics not covered in long questions	5	5	25
Short Answer Questions Topics not covered in long questions	5	3	15
		Total Marks	**60**

PAPERIV

Practicals120Hours

AppliedTechnologyPartI

1. ElectrodeIdentification
2. ElectrodeApplication
3. Care ofEEGElectrodes
4. MaintenanceofElectrodes
5. MaintenanceofEEGequipment
6. EEGrecording
7. NormalAwakeEEG
8. NormalSleepEEG

Practical Examinations

Spotteridentifications	30Marks
ElectrodeApplications	20Marks
NormalAwakeEEGInterpretation	30Marks
InternalAssessmentPractical	20Marks
Total	**100Marks**

PAPERV

Practicals120Hours

AppliedTechnologyPartII

1. ElectrodeIdentification
2. ElectrodeApplication
3. CareofElectrodes
4. MaintenanceofElectrodeandENMGmachinery
5. Nerveconductionstudies
6. Evokedpotentials
7. CalculationofMotorNerveConductionParameters
8. CalculationofSensoryNerveConductionParameters
9. InterpretationsofNerveConductionsStudies

Practical Examination

- CalculationofNerveConductionParameters 30Marks
- InterpretationsofNerveConductionsStudies 20Marks
- Spotteridentifications 20Marks
- MaintenanceofElectrode 10Marks
- InternalAssessmentPractical 20Marks

Total **100Marks**

PAPERVI

Theory30Hours

CommunicationSkills

Unit-I:

- Communication, its types and significance: Communication, Process of communication its kinds, channels and role in the society.
- Methodsof Communication(Oral,Written,Oneway, twowaycommunication skills).
- Readingskills:-Processofreading,readingpurpose,models,strategies methodologies, reading activities, structure of meaning techniques.

Unit-II

- PrécisandCommunication.
- Writingskills:-Elementsofeffectivewriting,writingstyles,scientificand technical writing.
- Grammar: -Transformation of sentences, wordsused asdifferent parts of speech, one word substitution, abbreviations, technical terms etc.

Unit-III

- Listeningskills:-Processoflistening,barrierstolistening,effectivelistening skills, feedback skills.
- Speaking skills :- Speech mechanism, organs of speech, production and classification of speech sounds, phonetic transcription, skills of effective speakingcomponentsofaneffectivetalk,oralpresentationandtheroleofaudio visual aids in it.
- Readingoftextbook.

Unit-IV

- Barriersof communicationandtechniqueto overcome those.
- Meaningofeffectivecommunication.
- TechnicalReportwriting.
- Practiceofwritingpersonalresumeandwritingapplicationforemployment.

Theory:80Marks

IA:20Marks

SemesterIV

PAPERI

Theory30Hours

BASICNEUROSCIENCESII

1. Epilepsies
    a. Primarygeneralized-Generalizedtonicclonicepilepsy, Absence& Myoclonicepilepsy
2. Partial- Simple partial seizures, Complex partial seizures & Partial with generalized seizures
3. Antiepilepticdrugs
4. Sedatives
5. Neostigmine,Pyridostigmine
6. Disturbancesofconsciousness
7. Cerebrovasculardisorders
8. Pyogenicmeningitis
9. Tubercularmeningitis
10. Encephalitis
11. Braindeath
12. Braintumors
13. Sleepdisorders

PAPERII

AppliedElectroencephalography

1. NormalawakeEEG
2. NormalSleepEEG
3. BenignphysiologicalvariantsofEEG
4. EEGinchildren
5. MaturationofEEGrhythm
6. EEGingeneralizedepilepsies
7. EEGinpartialepilepsies
8. EEGinmetabolicdiseaseofbrain
9. EEGchangesinCNSinfections
10. EEGinBrainDeath
11. EEGinheadtrauma, strokes,tumors
12. EEGchangesdueto medications
13. VideoEEG
14. LongtermEEGmonitoring
15. QuantitativeEEGanalysis
16. Spikedetection
17. Brainmapping
18. Polysomnography
19. Intra–operativeEEGmonitoring
20. Magnetoencephalography

PAPERIII

Practicals150Hours

AppliedTechnologyIII

1) RecordingofEEG

- Patientpreparation&Electrodeapplications
- RecordingofEEG
- Identificationandrectificationofartifacts

2) InterpretationofEEG

- NormalEEG
  - AwakeEEG
  - SleepEEG
- Focal abnormalities
- Generalisedabnormalities

3) FactualreportingofEEG

Practical Examination **200marks**

						Option A	Option B
EEG Recording							
	Patient preparation & Electrode application					50 marks	50 marks
	Recording EEG					50 marks	50 marks
EEG Interpretation							
	Awake record					20 marks	20 marks
	Generalized abnormality					20 marks	30 marks
	Localized abnormality					20 marks	30 marks
Internal Assessment (practical)						40 marks	20 marks
					Total	200 marks	200 marks

PAPERIV

Theory45Hours

LAW-INDIANCONSTITUTION

I. GOAL:

Thestudentsshouldgaintheknowledgeandinsightintothe IndianConstitutionso that they are aware of the fundamental rights and freedom bestowed through the democratic governance of our country.

II. OBJECTIVES:

A) KNOWLEDGE :

AttheendoftheB.Sc.1st Yearcoursethestudentisexpectedtoknow:

1) BasicknowledgeoftheIndianConstitution.
2) DemocraticinstitutionscreatedbytheConstitution.
3) SpecialrightscreatedbytheConstitutionforregionalandlinguisticminorities.
4) ElectionCommission.
5) Legislative,ExecutiveandJudicialpowersandtheirfunctionsinIndia.

B) SKILLS:

At the end of the B.Sc. 1st Year course the student is expected to make use of knowledge:

1) Toperformhis/herdutiestowardsthesocietyjudiciouslyandwithconscious effort for self-development.
2) ToutilizeStatepoliciesintheirfuturepractice.

COURSECONTENTS

Theory: 25 Hours

UnitI a)MeaningoftermConstitution.

b) MakingoftheIndianConstitution-1946-1949androleplayed by Dr. B. R. Ambedkar.

c) SalientFeaturesoftheConstitution.

d) Preamble of the Constitution. 2Hours

UnitII The democratic institutions created by the Constitution.

	BicameralSystemofLegislatureattheCentreandintheStates.	
	DevolutionofPowerstoPanchayatRajInstitutions.	5Hours
UnitIII	FundamentalRightsandDuties-Theircontentandsignificance	5Hours
UnitIV	DirectivePrinciplesofStatepolicies-Theneedtobalance Fundamental Rights with Directive Principles.	1Hour
UnitV	SpecialrightscreatedintheconstitutionforDalits, Backwardclass,WomenandChildren, andtheReligious and LinguisticMinorities	1Hour
UnitVI	DoctrineofSeparationofPowers-Legislative,Executiveand Judicial,andtheirfunctionsinIndia.	4Hours

Unit VIIThe Election Commission and State Public Service Commissions.2 Hours Unit VIIIMethod of amending the Constitution. 1Hour

UnitIXEnforcing rights through Writs Certiorari, Mandamus, Quo warrantoandHebeasCorpus. 2Hours

UnitXConstitutionandSustainableDevelopmentinIndia. 2Hours

SemesterV

PAPERI

Theory30Hours

BASICNEUROSCIENCESIII

1. Peripheralneuropathies
    a. Axonalneuropathies
    b. Demyelinatingneuropathies-GuillainBarreSyndrome and Chronic inflammatory demyelinating polyneuropathy
2. Mononeuritismultiplex
3. Traumaticneuropathies
4. Entrapmentneuropathies
5. Compressivemyelopathies
6. CNSDemyelinationandmultiplesclerosis
7. Inflammatorymyopathies-Polymyositisanddermatomyositis
8. MuscularDystrophies
9. Myotonia,
10. Myopathies
11. Movementdisorders–tremors,dystonia,Parkinson'sdisease

Schemeof Examination

Type of Questions & Topics	Questions to be asked	Questions to be answered	Marks
Long Essay Questions preferably from ♦ Guillain Barre syndrome ♦ Inflammatory myopathies ♦ Muscular dystrophies ♦ Multiple Sclerosis	2	2	20
Short Essay Questions Topics not covered in long questions	5	5	25
Short Answer Questions Topics not covered in long questions	5	3	15
		Total Marks	**60**

PAPERII

Theory30Hours

AppliedNerveconductions,Electromyographyandevokedpotentials

1. Nerveconductionstudiestechniques
2. Physiologicalvariablesaffectingnerveconductions
3. Nerveconductionsinpathologicalstates
    a. Demyelinatingneuropathies
    b. Axonopathy
    c. Entrapmentneuropathies
    d. Plexopathy
    e. Radiculopathy
4. Repetitivenervestimulation
5. H-reflexandF–response
6. Electromyographyinmyopathyandneuropathy
7. QuantitativeElectromyography
8. SinglefiberElectromyography
9. Turnsamplituderatio
10. Evokedpotentialsin
    a. Disordersofthecentralnervoussystem
    b. Disordersoftheperipheral nervoussystem
11. Eventrelatedpotentials
12. SurfacerecordingofEMGinmovementdisorders
13. Intraoperativemonitoring
    a. Nerveconductionsandelectromyography
    b. Evokedpotentials
14. Electronystagmography(ENG)
15. Magneticstimulation

a. Brain

b. Peripheralnerves

Schemeof Examination

Type of Questions & Topics	Questions to be asked	Questions to be answered	Marks
Long Essay Questions preferably from ♦ Physiological variables affecting nerve conduction studies ♦ Repetitive nerve stimulation ♦ Nerve conduction abnormalities in demyelinating neuropathies ♦ Nerve conduction abnormalities in axonal neuropathies	2	2	20
Short Essay Questions Topics not covered in long questions	5	5	25
Short Answer Questions Topics not covered in long questions	5	3	15
		Total Marks	**60**

PAPERIII

Theory150Hours

AppliedTechnologyIV

1. Nerveconductions studies
    a. motor nerveconductions
    b. sensory nerveconductions
    c. F –response
    d. H–reflex
2. RecordingR–Rvariation&sympatheticskin response
3. Interpretationof Nerveconductiongraphsanddata
4. FactualreportingofNerveconductionsstudies
5. Recordingevokedpotentials
    a. auditoryevokedpotentials
    b. Visualevokedpotentials
    c. Somatosensoryevokedpotentials
6. Factualreportingevokedpotentials

Practical Examination

	Option A	Option B
Motor nerve conductions	40	50
Performing Sensory Nerve conductions	40	50
Interpretation of Nerve conduction data	40	40
Performing Evoked Potentials	40	40
Internal Assessment (Practicals)	40	20
Total	200 marks	200 marks

PAPERIV

Theory45Hours

FundamentalsofComputers-I

- **Introduction to computer:** introduction, characteristics of computer, block diagramofcomputer,generationsofcomputer,computerlanguages.**Inputoutput devices:**input devices(keyboard, point anddrawdevices,datascanningdevices, digitizer, electroniccardreader, voicerecognitiondevices, vision-input devices), outputdevices(monitors,pointers,plotters,screenimageprojector,voiceresponse systems).

- **Processor and memory:** The Central Processing Unit (CPU), main memory. **StorageDevices:**sequentialanddirectaccessdevices,magnetictape,magnetic disk,opticaldisk,massstoragedevices.**IntroductiontoMS-Word:**introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge. **IntroductiontoExcel:**introduction,aboutworksheet,enteringinformation,saving workbooksandformatting,printingtheworksheet,creatinggraphs.**Introduction to power-point:** introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.

- **Introduction of Operating System:** introduction, operating system concepts, types of operating system. **Introduction to MS-DOS:** History of DOS, features of MS-DOS, MS-DOS Commands (internal and external). **Introduction of windows:** History, features, desktop, taskbar, icons on the desktop, operation withfolder,creatingshortcuts,operationwithwindows(opening,closing,moving, resizing, minimizing and maximizing, etc.).

- **Computernetworks:**introduction,typesofnetwork(LAN,MAN,WAN,Internet, Intranet),networktopologies(star,ring, bus,mesh,tree, hybrid),componentsof network. **Internet and its Applications:** definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet. **Application of Computers in various fields:** Medical, Education, Railway, Defense, Industry, Management, Sports, Commerce, Internet. ***Introduction to installation of different software and introduction about different software related to MLS.***

Practicals:

LearningtouseMSOffice:MSWORD,MS EXCEL& MS PowerPoint

PracticalExamination:80Marks IA

: 20 Marks

SIXTHSEMESTER
PAPER II

Theory45Hours

HumanValuesandProfessionalEthics

Unit-I

1. Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

- Understandingtheneed,basicguidelines,contentandprocessforValue Education.
- SelfExploration–whatisit?-itscontentandprocess;‘NaturalAcceptance’ and Experiential Validation- as the mechanism for self exploration.
- ContinuousHappiness and Prosperity-Alook at basic HumanAspirations Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
- Method to fulfill the above human aspirations: understanding and living in harmony at various levels

Unit-II

2. UnderstandingHarmonyintheHumanBeing-HarmonyinMyself!

- Understandinghumanbeingasaco-existenceofthesentient‘I’andthematerial ‘Body’
- UnderstandingtheneedsofSelf(‘I’)and‘Body’-*Sukh*and*Suvidha*
- Understanding the Body as an instrument of ‘I’ (I being the doer, seer andenjoyer)
- Understandingthecharacteristics andactivities of ‘I’and harmonyin ‘I’
- UnderstandingtheharmonyofIwiththeBody:*Sanyam*and*Swasthya*;correct appraisal of Physical needs, meaning of Prosperity in detail
- Programsto ensure*Sanyam*and*Swasthya***(6 Hrs)**

Unit-III

3. UnderstandingHarmonyintheFamilyandSociety-HarmonyinHuman-Human Relationship

- UnderstandingharmonyintheFamily-thebasicunitofhumaninteraction
- Understanding values in human-human relationship; meaning of Nyaya and programforitsfulfillmenttoensureUbhay-tripti;Trust(Vishwas)andRespect (Samman) as the foundational values of relationship
- Understanding the meaning of Vishwas; Difference between intention and competence
- Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship
- Understanding theharmonyinthesociety(societybeinganextensionoffamily): Samadhan, Samridhi,Abhay, Sah-astitva as comprehensive Human Goals
- Visualizing a universal harmonious order in society- Undivided Society (AkhandSamaj), Universal Order (Sarvabhaum Vyawastha)- from family to world family! **(6 Hrs.)**

Unit-IV

4. Understanding Harmony in the Nature and Existence - Whole existence as Co-existence

- UnderstandingtheharmonyintheNature
- Interconnectednessandmutualfulfillmentamongthefourordersofnature-recyclability and self-regulation in nature
- UnderstandingExistenceasCo-existence(*Sah-astitva*)ofmutually interacting units in all-pervasive space
- Holisticperceptionofharmonyatalllevelsofexistence**(4Hrs)**

5. Implicationsof theabove HolisticUnderstanding of Harmonyon Professional Ethics

- Naturalacceptanceofhumanvalues
- DefinitivenessofEthicalHumanConduct

- BasisforHumanisticEducation,HumanisticConstitutionandHumanistic Universal Order
- Competenceinprofessionalethics:
- Abilitytoutilizetheprofessionalcompetenceforaugmentinguniversalhuman order
- Ability to identify the scope and characteristics ofpeople-friendly and eco-friendly production systems
- Abilitytoidentifyanddevelopappropriatetechnologiesandmanagement patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- StrategyfortransitionfromthepresentstatetoUniversalHumanOrder:
- At the level of individual: as socially and ecologically responsible engineers, technologists and managers
- Atthelevelofsociety:asmutuallyenrichinginstitutionsandorganizations

TextBook: **(6Hrs.)**

1. RRGaur,RSangal,GPBagaria,2009,*AFoundationCourseinValueEducation*.

OtherSuggestedReadings/Books:

1. IvanIllich,1974,Energy&Equity,TheTrinityPress,Worcester,andHarperCollins, USA
2. E.F.Schumacher,1973,SmallisBeautiful:astudyofeconomicsasifpeoplemattered, Blond & Briggs, Britain.
3. ANagraj,1998,JeevanVidyaekParichay,DivyaPathSansthan,Amarkantak.
4. SussanGeorge,1976,HowtheOtherHalfDies,PenguinPress.Reprinted1986, 1991
5. PLDhar,RRGaur,1990,ScienceandHumanism,CommonwealthPurblishers.
6. A.N.Tripathy,2003,HumanValues,NewAgeInternationalPublishers
7. SubhasPalekar,2000,HowtopracticeNaturalFarming,Pracheen(Vaidik)Krishi TantraShodh,Amravati.

8. DonellaH.Meadows,DennisL.Meadows,JorgenRanders,WilliamW.BehrensIII, 1972,LimitstoGrowth–ClubofRome'sreport,UniverseBooks.

9. EGSeebauer&RobertL.Berry,2000,FundamentalsofEthicsforScientists& Engineers , Oxford University Press

10. MGovindrajran,SNatrajan&V.S.SenthilKumar,EngineeringEthics(includingHuman Values),EasternEconomyEdition,PrenticeHallofIndiaLtd

11. BPBanerjee,2005,FoundationsofEthicsandManagement,ExcelBooks.

12. BLBajpai,2004,IndianEthosandModernManagement,New

ListofReferenceBooks(LatestEdition)

Sl. No	Name of the Text Book	Author
1	Clinical Neuroanatomy	Snell R
2	Adams and Victor's Principles of Neurology	Ropper AH, Samuels MA, Klein JP
3	Electroencephalography	Niedermeyer E Fernando Lopes De Silva
4	Current Practice of Clinical Electroencephalography	Ebersole JS, Pedley TA
5	Clinical Electroencephalography	UK Mishra, J Kalita
6	Clinical Neurophysiology: Nerve Conduction Study, Electromyography and Evoked Potentials	UK Mishra, J Kalita
7	Clinical EMG and Nerve Conductions	Shin J Oh
8	Electrodiagnosis in Clinical Neurology	Aminoff MJ.