

# SUMANDEEP VIDYAPEETH

(Declared as Deemed to be University under Section 3 of the UGC Act 1956)

Accredited by NAAC with a CGPA of 3.53 out of four-point scale at 'A' Grade

Category – I deemed to be university under UGC Act - 2018

At & Post Piparia, Tal: Waghodia 391760 (Gujarat) India.

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## CURRICULUM Master of Science (M.Sc) MEDICAL PHYSIOLOGY

Attested CTC

*Charaney*  
15/2/2021

Vice-Chancellor

Sumandeep Vidyapeeth

An Institution Deemed to be University

VIII, Piparia, Taluka: Waghodia.

Dist. Vadodara-391 760. (Gujarat)

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AMENDED UP TO DECEMBER -2020

## SUMANDEEP VIDYAPEETH SYLLABUS

### PROGRAMME OUTCOME : M.SC. MEDICAL

THE MASTER OF SCIENCE IN MEDICAL FIELD PROVIDES THE CANDIDATE WITH KNOWLEDGE, GENERAL COMPETENCE, AND ANALYTICAL SKILLS ON AN ADVANCED LEVEL, NEEDED IN CONSULTANCY, EDUCATION, RESEARCH.

### PROGRAMME SPECIFIC OUTCOME : M.SC. MEDICAL

**POS 1.** A POST GRADUATE STUDENT AFTER UNDERGOING THE REQUIRED TRAINING SHOULD BE ABLE TO DEAL WITH THE ALLIED DEPARTMENTS AND RENDER SERVICES IN ADVANCED LABORATORY INVESTIGATIONS.

**POS 2.** THE PG STUDENT SHOULD ACQUIRE BASIC SKILLS IN TEACHING MEDICAL/PARA-MEDICAL STUDENTS

**POS 3.** THE STUDENT SHOULD HAVE KNOWLEDGE ABOUT THE PRINCIPLES OF RESEARCH METHODOLOGY AND SELF-DIRECTED LEARNING FOR CONTINUOUS PROFESSIONAL DEVELOPMENT.

**POS 4.** THE STUDENT SHOULD BE ABLE TO CARRY OUT A RESEARCH PROJECT FROM PLANNING TO PUBLICATION AND BE ABLE TO PURSUE ACADEMIC INTERESTS.

**COURSE OUTCOME (CO) :** A POST GRADUATE STUDENT HAVING QUALIFIED THE M.SC. (PHYSIOLOGY) EXAMINATION SHALL ACHIEVED COMPETENCY TO:

1. Understand and deal with all aspects of general, systemic and applied Physiology.
2. Teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases (pathophysiology) affecting various organ systems and the physiological basis of their management to undergraduate medical, paramedical and all other basic science students.
3. Understand general principles of medical education (use of appropriate teaching techniques and resources).
4. Explain how the knowledge of physiology can be effectively used in a various clinical settings to solve diagnostic and therapeutic problems.
5. Interpret and evaluate research publications critically.
6. Use the library facilities (Literature database using computer, CD ROM, internet search and any other available newer techniques).
7. Conduct relevant clinical/experimental research which may have significant bearing on human health and patient care.
8. Interpret the research findings in the light of its basic and applied significance.
9. Acquire skills in conducting collaborative research in the field of physiology with allied sciences, clinical sciences and biomedical engineering.
10. Interact with the allied departments and render services in advanced laboratory investigations.
11. Serve as interface with society at large.
12. Acquire administrative skills to set up concerned department / laboratories and initiate purchase procedure and procure necessary items for running such laboratories.

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## M.SC. (MEDICAL) PART- I

**Duration: 1 yrs.**

**Aim of Part-I M.Sc. (Medical)** course is to impart basic knowledge of all pre clinical and paraclinical subjects including Anatomy, Physiology, Biochemistry, Pathology, Microbiology, and Pharmacology. Therefore, conduct of part I course is common for all M.Sc. (Medical) candidates. Teaching is mainly in the form of theory lectures.

### TEACHING PROGRAM (CURRICULUM)

#### PHYSIOLOGY

**General Physiology:** Cell structure, organelles and functions; Homeostasis; Cell membrane transport; Membrane potentials.

**Blood:** Composition & functions; Plasma proteins; Morphology, functions & development of R.B.C., W.B.C. & Platelets; Hemoglobin- formation, functions & fate; E.S.R.; Hemostasis, Blood coagulation & Anticoagulants; Blood groups & their significance; Body fluid compartments, Blood volume; Reticulo-endothelial system & spleen.

**Cardiovascular System:** General outline; Structure & properties of cardiac muscle; Cardiac cycle; Heart sounds; Heart rate & its regulation; Blood pressure & its regulation; Regional circulation; Haemorrhage; Changes during muscular exercise.

**Respiratory System:** Mechanics of Breathing; Intrapleural & intrapulmonary pressures; Lung volumes & capacities; O<sub>2</sub> and CO<sub>2</sub> carriage and their exchange in tissues & lungs; Respiratory centres, Nervous & chemical regulation of respiration; Hypoxia, Asphyxia, Cyanosis, Acclimatization.

**Digestive system:** Composition, functions & regulation of digestive juices- Saliva, Gastric juice, Bile, Pancreatic juice & Succus entericus; Motility of G.I.T.- Deglutition, Peristalsis & segmentation, Contraction & emptying of Gall bladder; Digestion & absorption of food constituents, Functions of liver.

**Endocrines:** Secretion, actions & regulation and abnormalities of hormones of Anterior & posterior pituitary, Thyroid, Parathyroid, Adrenal cortex & medulla and Endocrine pancreas.

**Reproductive system:** Sex determination & development; Puberty; Male sex hormones & their functions; Spermatogenesis; Female sex hormones & their actions; Ovulation & Menstrual cycle; Pregnancy; Functions of placenta; Lactation; Physiological basis of family planning methods.

**Excretory system:** Nephron; Renal circulation; Mechanism of urine formation; Renal function tests; Physiology of micturition.

**Muscle:** Types of muscles; Structure & properties; Sarcomere; Mechanism of muscle contraction; Changes during muscle contraction; Isotonic & isometric contraction; Fatigue; Rigor mortis.

**Nerve:** Neurone; types of nerve fibres; Origin & conduction of nerve impulse; Degeneration & regeneration in peripheral nerve fibres; Neuro muscular junction- structure, transmission, drugs acting & Myasthenia Gravis.

**Nervous system:** Receptors; Sensations; Synapse- structure, transmission & properties; Reflex action; Spinal cord – ascending & descending tracts, Hemisection & complete transection; Upper & lower motor neurone lesion; Structure, connections & functions of Cerebellum, Thalamus, Hypothalamus, Basal Ganglia & Reticular formation; Higher functions; Maintenance of tone, posture & equilibrium; Autonomic nervous system.

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**Special senses:**

Eye:- Broad structure of eye; Errors of refraction; Accommodation; Photochemistry; Visual pathways & lesions; Colour vision.

Ear:- Structure & functions of external & middle ear; Mechanism of hearing; Auditory pathways; Deafness.

Physiology of Taste & Smell.

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**M.Sc. Part I: Scheme of Examination**

**N.B.**Theory only no Practical examination.

Two Internal assessment tests, one each at the end of First and Second term respectively.  
One Preliminary examination at the end of Third term, consisting of full course.

**Internal Credit Marks:** 30 credit marks.  
(Best of two Internal tests and Preliminary Exam)

**Final University Examination**

One paper in : 70 marks

Credit marks : 30 marks

Total marks : 100 marks

**Passing Standard : 50%**

*TO INTRODUCE 3 YEARS DURATION OF M.SC MEDICAL FROM ACADEMIC YEAR 2020-21 ONWARDS.  
(BOARD OF STUDIES LETTER NO.: SBKSMIRC/DEAN/2234, DATED 23/12/2019 AND VIDE  
NOTIFICATION OF BOARD OF MANAGEMENT RESOLUTION REF: No. SVDU/NOTYN/061/2019-20  
DATED 02/03/2020*

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**SUMANDEEP VIDYAPEETH  
SBKS MEDICAL INSTITUTE & RESEARCH CENTER  
PHYSIOLOGY  
M.Sc (MEDICAL) PART-I UNI EXAM PAPER PATTERN**

**TIME: 3 HRS.  
DATE:**

- NOTES:** 1) ANSWER SHOULD BE BRIEF AND TO THE POINT  
2) DRAW DIAGRAMS WHEREEVER REQUIRED  
3) EACH SECTION SHOULD BE WRITTEN IN SEPARATE ANSWER BOOKS  
4) FIGURE ON THE RIGHT INDICATE MAXIMUM MARKS

**MAX. MARKS: 70**

**SECTION I**

1. Describe briefly on anytwo (15)  
a)  
b)  
c)
2. Describe briefly on anytwo (10)  
a)  
b)  
c)
3. Write short note on any two(10)  
a)  
b)  
c)

**SECTION II**

4. Describe briefly on ant two(15)  
a)  
b)  
c)
5. Write briefly on any two (10)  
a)  
b)  
c)
6. Write short notes on any two (10)  
a)  
b)

**PHYSIOLOGY — M.SC. (MEDICAL) PART II**

**Attested CTC**  
**DURATION: 2 YRS.**

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## OBJECTIVES

THE M.Sc.(MEDICAL) IN PHYSIOLOGY PROGRAM HAS THE FOLLOWING BROAD AND INTERMEDIATE OBJECTIVES:

### BROAD OBJECTIVES

THE CANDIDATE QUALIFYING FOR THE AWARD OF M.Sc.(MEDICAL) PHYSIOLOGY SHOULD BE ABLE TO:

1. DEMONSTRATE COMPREHENSIVE UNDERSTANDING OF PHYSIOLOGY AS WELL AS THAT OF THE APPLIED DISCIPLINES;
2. DEMONSTRATE ADEQUATE KNOWLEDGE OF THE CURRENT DEVELOPMENTS IN MEDICAL SCIENCES AS RELATED TO PHYSIOLOGY;
3. TEACH UNDERGRADUATES AND POSTGRADUATES IN PHYSIOLOGY;
4. PLAN AND CONDUCT RESEARCH;
5. PLAN EDUCATIONAL PROGRAMS IN PHYSIOLOGY UTILIZING MODERN METHODS OF TEACHING AND EVALUATION;
6. ORGANIZE AND EQUIP PHYSIOLOGY LABORATORIES.

### INTERMEDIATE OBJECTIVES

THE CANDIDATE QUALIFYING FOR THE AWARD OF M.Sc.(MEDICAL) IN PHYSIOLOGY SHOULD BE ABLE TO:

1. DEMONSTRATE COMPREHENSIVE UNDERSTANDING OF THE STRUCTURE, FUNCTION AND DEVELOPMENT OF THE HUMAN BODY AS RELATED TO PHYSIOLOGY,
  2. DEMONSTRATE ELEMENTARY UNDERSTANDING OF THE CLINICAL APPLICATIONS OF PHYSIOLOGY,
  3. CRITICALLY EVALUATE THE IMPACT OF THE RECENT INFORMATION ON THE GENESIS OF CURRENT CONCEPTS RELATED TO VARIOUS TOPICS OF PHYSIOLOGY;
  4. RECAPITULATE THE INFORMATION IMPARTED TO THE UNDERGRADUATE STUDENTS IN PHYSIOLOGY;
  5. PERFORM AND CRITICALLY EVALUATE THE PRACTICAL EXERCISES DONE BY UNDERGRADUATE STUDENTS;
  6. IDENTIFY A RESEARCH PROBLEM WHICH COULD BE BASIC, FUNDAMENTAL OR APPLIED IN NATURE; DEFINE THE OBJECTIVES OF THE PROBLEM AND GIVE A FAIR ASSESSMENT AS TO WHAT IS EXPECTED TO BE ACHIEVED AT THE COMPLETION OF THE PROJECT; DESIGN AND CARRY OUT TECHNICAL PROCEDURES REQUIRED FOR THE STUDY; RECORD ACCURATELY AND SYSTEMATICALLY THE OBSERVATIONS AND ANALYZE THEM OBJECTIVELY; EFFECTIVELY USE STATISTICAL METHODS FOR ANALYZING THE DATA; INTERPRET THE OBSERVATIONS IN THE LIGHT OF EXISTING KNOWLEDGE AND HIGHLIGHT IN WHAT WAY HIS OBSERVATIONS HAVE ADVANCED SCIENTIFIC KNOWLEDGE; WRITE A SCIENTIFIC PAPER ON THE LINES ACCEPTED BY STANDARD SCIENTIFIC JOURNALS;
  7. DESIGN, FABRICATE AND USE INDIGENOUS GADGETS FOR EXPERIMENTAL PURPOSES;
  8. DEMONSTRATE FAMILIARITY WITH THE PRINCIPLES OF MEDICAL EDUCATION INCLUDING DEFINITIONS OF OBJECTIVES, CURRICULUM CONSTRUCTION, MERITS AND MERITS OF VARIOUS TOOLS USED IN THE TEACHING-LEARNING PROCESS; USE OF LEARNING AIDS AND LEARNING SETTINGS, AND METHODS OF EVALUATION;
  9. SHARE LEARNING EXPERIENCES WITH THE UNDERGRADUATE AND POSTGRADUATE STUDENTS USING APPROPRIATE PEDAGOGICAL SKILLS AND METHODS;
  10. DRAW OUT MEANINGFUL CURRICULA FOR TEACHING MEDICAL AND PARAMEDICAL COURSES;
- GIVE LUCID, INTERACTIVE LECTURES, PRESENTING THE INFORMATION IN A LOGICAL, SIMPLE AND COMPREHENSIVE MANNER; GENERATE INTEREST AND CURIOSITY AMONGST THE

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STUDENTS DURING LECTURES; GIVE PRACTICAL DEMONSTRATIONS; **11** ORGANIZE THE LABORATORIES FOR VARIOUS PRACTICAL EXERCISES, SUBSTITUTE AND FABRICATE SOME OF THE SIMPLER EQUIPMENT FOR TEACHING PURPOSES; AND **12** HANDLE AND ORDER FOR STORES, DRAW UP LISTS OF EQUIPMENT REQUIRED TO EQUIP PHYSIOLOGY LABORATORIES

### **TEACHING PROGRAMME**

TO ACHIEVE THE ABOVE OBJECTIVES IN TWO YEARS, THERE COULD BE FOLLOWING STRUCTURED PROGRAM.

#### **SEMESTER 1**

1. ORIENTATION TO THE DEPARTMENT
2. CHOOSING THE SUBJECT OF THESIS AND GUIDE
3. WRITING THE PROTOCOL
4. RECAPITULATION OF UNDERGRADUATE PHYSIOLOGY THROUGH ATTENDING UG LECTURES

#### **SEMESTER 2**

1. PHYSIOLOGY: THEORY & PRACTICAL
2. THESIS WORK
3. RECAPITULATION OF UNDERGRADUATE PHYSIOLOGY THROUGH ATTENDING UG LECTURES

#### **SEMESTER 3**

1. PHYSIOLOGY: THEORY & PRACTICAL
2. THESIS WORK

#### **SEMESTER 4**

1. PHYSIOLOGY: THEORY & PRACTICAL
2. SUBMISSION OF THESIS

### **COURSE AND CURRICULUM**

#### **PHYSIOLOGY: THEORY & PRACTICAL**

(THE THEORY AND PRACTICAL SYLLABUS IS COMPLETED IN FOUR SEMESTERS.)

#### **GENERAL & CELLULAR PHYSIOLOGY**

CELL AS THE LIVING UNIT OF THE BODY, THE INTERNAL ENVIRONMENT, HOMEOSTASIS, CONTROL SYSTEMS, ORGANIZATION OF A CELL, PHYSICAL STRUCTURE OF A CELL, TRANSPORT ACROSS CELL MEMBRANES, MEMBRANE POTENTIALS, FUNCTIONAL SYSTEMS IN THE CELLS, GENETIC CODE, ITS EXPRESSION, AND REGULATION OF GENE EXPRESSION, CELL CYCLE AND ITS REGULATION.

#### **HEMATOLOGY**

- ERYTHROCYTES: STRUCTURE & FUNCTION OF RBCs, ERYTHROPOIESIS, FORMATION OF HAEMOGLOBIN, DESTRUCTION & FATE OF RBCs, ANEMIAS, POLYCYTHEMIAS
- LEUCOCYTES: GENERAL CHARACTERISTICS, GENESIS & LIFE SPAN OF WBCs, CLASSIFICATION & FUNCTIONS OF EACH TYPE OF WBC, LEUKOPENIA, LEUCOCYTOSIS, LEUKEMIAS
- BLOOD GROUPS: CLASSIFICATION, ANTIGENICITY, AGGLUTINATION, BLOOD TYPING, PRINCIPLES OF TRANSFUSION MEDICINE
- HAEMOSTASIS: COMPONENTS OF HAEMOSTASIS, PLATELET STRUCTURE AND FUNCTIONS,

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MECHANISMS OF COAGULATION, COAGULATION TEST, ANTICOAGULANTS

• IMMUNITY: INNATE IMMUNITY, ACQUIRED IMMUNITY, ALLERGY, HYPERSENSITIVITY AND IMMUNODEFICIENCY, PSYCHONEUROIMMUNOLOGY.

### **RENAL PHYSIOLOGY & FLUID BALANCE**

• BODY FLUID COMPARTMENTS, WATER BALANCE; REGULATION OF FLUID BALANCE

• KIDNEY: NEPHRON, RENAL CIRCULATION, URINE FORMATION, REGULATION OF EXTRACELLULAR SODIUM & OSMOLARITY, RENAL MECHANISMS FOR THE CONTROL OF BLOOD VOLUME, BLOOD PRESSURE & IONIC COMPOSITION, REGULATION OF ACID-BASE BALANCE. DIURETICS, RENAL FAILURE.

• MICTURITION

### **CARDIO-VASCULAR PHYSIOLOGY**

PROPERTIES OF CARDIAC MUSCLE, CARDIAC CYCLE, HEART AS A PUMP, CARDIAC OUTPUT, NUTRITION & METABOLISM OF HEART, SPECIALIZED CONDUCTIVE TISSUES OF THE HEART. GENERATION & CONDUCTION OF CARDIAC IMPULSE, CONTROL OF EXCITATION & CONDUCTION, ARRHYTHMIAS, ELECTROCARDIOGRAM

• PRINCIPLES OF HEMODYNAMICS, BLOOD PRESSURE AND ITS REGULATION, NEUROHUMORAL REGULATION OF CARDIOVASCULAR FUNCTION

• MICROCIRCULATION & LYMPHATIC SYSTEM

• REGIONAL CIRCULATIONS

• CARDIAC FAILURE

• CIRCULATORY SHOCK

### **RESPIRATION**

\* FUNCTIONAL ANATOMY OF RESPIRATORY SYSTEM, LUNG VOLUMES AND CAPACITIES, PULMONARY VENTILATION, ALVEOLAR VENTILATION, DEAD SPACE, PULMONARY CIRCULATION, PLEURAL FLUID,

\* MECHANICS OF RESPIRATION: MUSCLES OF BREATHING, MOVEMENTS OF RIBS AND THORACIC CAGE, INTRA PLEURAL AND PULMONARY PRESSURES, WORK OF BREATHING, LUNG COMPLIANCE, LUNG SURFACTANT.

• PRINCIPLES OF GAS EXCHANGE, OXYGEN & CARBON-DIOXIDE TRANSPORT

• REGULATION OF RESPIRATION; NERVOUS AND CHEMICAL

• HYPOXIA, CYANOSIS, PERIODIC BREATHING, ASPHYXIA, DYSPNEA

\* PULMONARY FUNCTION TESTS

• OXYGEN THERAPY & TOXICITY

• ARTIFICIAL RESPIRATION

### **ENVIRONMENTAL PHYSIOLOGY**

• PHYSIOLOGY OF HOT AND COLD ENVIRONMENT, BODY TEMPERATURE REGULATION, PYREXIA, HYPOTHERMIA.

• HIGH ALTITUDE, AVIATION AND SPACE PHYSIOLOGY

• DEEP SEA DIVING & HYPERBARIC CONDITIONS, DECOMPRESSION SICKNESS

### **NERVE & MUSCLE PHYSIOLOGY**

• RESTING MEMBRANE POTENTIAL AND ACTION POTENTIAL

• CLASSIFICATION OF NERVE FIBRES, NERVE CONDUCTION, DEGENERATION AND REGENERATION IN NERVES

• FUNCTIONAL ANATOMY OF SKELETAL MUSCLE, EXCITATION-CONTRACTION COUPLING, MECHANISMS OF MUSCLE CONTRACTION

• SMOOTH MUSCLE

• NEURO-MUSCULAR TRANSMISSION AND BLOCKS

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## NERVOUS SYSTEM

GENERAL, SENSORY PHYSIOLOGY: GENERAL DESIGN OF NERVOUS SYSTEM, INTERNEURONAL COMMUNICATION, CLASSIFICATION OF SOMATIC SENSATIONS, SENSORY RECEPTORS, SENSORY TRANSDUCTION, INFORMATION PROCESSING, DORSAL COLUMN & MEDIAL LEMNISCAL SYSTEM, THALAMUS, SOMATOSENSORY CORTEX, SOMATOSENSORY ASSOCIATION AREAS, PAIN PHYSIOLOGY GENERAL MOTOR PHYSIOLOGY: ORGANIZATION OF SPINAL CORD FOR MOTOR FUNCTION, REFLEXES & REFLEX ARC, BRAIN STEM & CORTICAL CONTROL OF MOTOR FUNCTION, CEREBELLUM, BASAL GANGLIA, MAINTENANCE OF POSTURE AND EQUILIBRIUM, MOTOR CORTEX.

## SPECIAL SENSES

- VISION: STRUCTURE OF EYE BALL, INTRA OCULAR FLUIDS AND PRESSURE, ACCOMMODATION, OPTICS OF VISION AND REFRACTIVE ERRORS, RECEPTORS & NEURAL FUNCTIONS OF RETINA, COLOUR VISION, PERIMETRY, VISUAL PATHWAYS AND LESIONS, CORTICAL VISUAL FUNCTION. LACRIMATION, MOVEMENTS OF EYE BALL.
- HEARING: STRUCTURE AND FUNCTIONS OF EXTERNAL AND MIDDLE EAR, ORGAN OF CORTI, COCHLEAR POTENTIALS, AUDITORY PATHWAYS, CORTICAL AUDITORY FUNCTION, DEAFNESS & HEARING AIDS
- TASTE: PRIMARY TASTE SENSATIONS, TASTE BUDS, TRANSDUCTION & TRANSMISSION OF TASTE SIGNALS PERCEPTION OF TASTE.
- SMELL (OLFACTION): PERIPHERAL OLFACTORY MECHANISMS, OLFACTORY PATHWAYS, OLFACTORY PERCEPTION.

## LIMBIC SYSTEM AND HIGHER NERVOUS SYSTEM

- AUTONOMIC NERVOUS SYSTEM
- LIMBIC SYSTEM AND HYPOTHALAMUS
- SLEEP & EEG.
- EMOTIONS & BEHAVIOUR
- LEARNING & MEMORY
- YOGA

## NUTRITION & METABOLISM

- CARBOHYDRATES, FATS, PROTEINS, MINERALS AND VITAMINS.
- DIETARY FIBRE, RECOMMENDED DIETARY ALLOWANCES, BALANCED DIET, DIET FOR INFANTS, CHILDREN, PREGNANT & LACTATING MOTHERS, AND THE ELDERLY
- ENERGY METABOLISM
- OBESITY & STARVATION

## GASTRO-INTESTINAL SYSTEM

- GENERAL PRINCIPLES OF G-I FUNCTION
- DIGESTIVE JUICES: COMPOSITION, FUNCTIONS AND REGULATION OF SALIVA, GASTRIC JUICE, SUCCUS ENTERICUS, BILE AND PANCREATIC JUICE.
- GASTRIC MUCOSAL BARRIER
- MOTILITY: MASTICATION & SWALLOWING DEGLUTITION, GASTROINTESTINAL MOTILITY.
- DIGESTION & ABSORPTION
- FUNCTIONS OF COLON
- PATHOPHYSIOLOGY OF PEPTIC ULCER AND DIARRHEAL DISEASE
- LIVER FUNCTIONS

## ENDOCRINES

- CLASSIFICATION OF HORMONES, MECHANISM OF HORMONE ACTION, MEASUREMENT OF HORMONES IN BLOOD.
- ENDOCRINE FUNCTIONS OF THE HYPOTHALAMUS

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- PITUITARY, THYROID, ADRENALS: HORMONES SECRETION, ACTIONS AND DISORDERS
- THE ENDOCRINE PANCREAS, PATHOPHYSIOLOGY OF DIABETES
- PARATHYROID, CALCITONIN, VIT D & CALCIUM METABOLISM
- PINEAL GLAND

### **REPRODUCTION**

SEX DETERMINATION & SEX DIFFERENTIATION, PUBERTY

- MALE: TESTOSTERONE & MALE SEX HORMONES, SPERMATOGENESIS, HYPER & HYPOGONADISM

• FEMALE: OVARY & FEMALE SEX HORMONES, OVULATION, MENSTRUAL CYCLE, FERTILIZATION & IMPLANTATION, PREGNANCY, FUNCTIONS OF PLACENTA, PARTURITION, LACTATION.

\* PRINCIPLES OF METHODS OF FAMILY PLANNING AND WELFARE

\* **APART FROM THE ABOVE TOPICS IN GENERAL AND SYSTEMIC PHYSIOLOGY, THE STUDENTS ARE INTRODUCED TO:**

1. BIOPHYSICS
2. BIOCHEMISTRY
3. BIostatISTICS
4. MOLECULAR BIOLOGY
5. MEDICAL EDUCATION
6. HISTORY OF MEDICINE

THE ABOVE TOPICS ARE TO BE COVERED THROUGH A MIX OF SELF-LEARNING AND STRUCTURED PROGRAM CONSISTING OF SEMINARS, JOURNAL CLUBS AND FACULTY PRESENTATIONS.

### **EBES INTEGRATION:**

ALL POST GRADUATES AFTER ENROLMENT WILL BE EXPOSED TO ORGANIZED EVIDENCE SEARCHING SKILLS LECTURES ALONG WITH TEACHING OF CLINICAL EPIDEMIOLOGY, BIostatISTICS AND RESEARCH METHODOLOGY.

ALL THE POST GRADUATE JOURNAL CLUBS WILL BE CARRIED OUT ON A PRESCRIBED EVIDENCE BASED FORMAT WITH EMPHASIS ON CRITICAL APPRAISAL. A DESIGNATED TEACHER/FACILITATOR WILL ASSES EVERY POST GRADUATE STUDENT FOR EACH JC PRESENTATION.

ALL PG SEMINARS WILL HAVE EVIDENCE EMBEDDED IN THE PRESENTATION AND ALL REFERENCES RELATING TO THE SUBJECT MATTER WILL BE INCORPORATED. AT THE END OF THE SEMINAR ALL THE REFERENCES WILL BE LISTED AND THE SEMINAR WILL BE ASSESSED BY THE FACILITATOR.

IN THE OPD/WARD/ICU/OT/PRACTICAL SKILLS/EQUIVALENT ACTIVITY IN PRE- PARA CLINICAL DEPARTMENT, EVERY POST GRADUATE STUDENT WILL BE EXPOSED TO AT LEAST ONE ENCOUNTER OF ROLE MODELING IN WHICH A CONSULTANT AFTER RAISING A RELEVANT QUERY WILL SEARCH FOR ITS EVIDENCE AND DEMONSTRATE EVIDENCE SEARCHING METHODOLOGIES, ITS IMPORTANCE AND UTILITY TO THE STUDENT.

#### **1. SEMINARS(ONCE A WEEK):**

THE SEMINARS ARE ON A TOPIC BELONGING TO A SYSTEM SCHEDULED FOR THE SEMESTER.

THE TOPIC IS PRESENTED IN DEPTH APPROPRIATE FOR POSTGRADUATES BY ONE OF THE M.Sc. STUDENTS AND MODERATED BY A FACULTY MEMBER. THE SEMINARS REPRESENT ONLY A SMALL AND SOMEWHAT ARBITRARY SELECTION OF TOPICS. THEY ARE NOT INTENDED TO COVER AN ENTIRE SYSTEM. THE AIMS ARE TO:

- (A) INTRODUCE THE SYSTEM
- (B) TUNE THE STUDENTS TO THE SYSTEM
- (C) COVER RECENT ADVANCES
- (D) GIVE STUDENTS PRACTICE IN THE ART OF ORAL PRESENTATION

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## 2. JOURNAL CLUBS AND FACULTY PRESENTATIONS, ONCE A WEEK

THE JOURNAL CLUBS ARE ON AN ARTICLE BELONGING TO A SYSTEM TAUGHT. THE ARTICLE IS PRESENTED BY AN M.Sc./M.D./PH.D .STUDENT OR TUTOR, AND MODERATED BY A FACULTY MEMBER.

**THE AIMS OF JOURNAL CLUBS ARE TO:**

- (A) HIGHLIGHT RECENT ADVANCES
- (B) DISCUSS CLASSICAL PAPERS
- (C) INCULCATE THE FACULTY OF CRITICAL APPRECIATION OF A RESEARCH ARTICLE
- (D) GIVE STUDENTS AND TUTORS PRACTICE IN THE ART OF ORAL PRESENTATION

**FACULTY PRESENTATIONS ARE USUALLY ON:**

- (A) MEDICAL EDUCATION
- (B) RESEARCH METHODOLOGY
- (C) AN AREA OF RESEARCH IN WHICH THE FACULTY MEMBER IS INVOLVED

## 3. PRACTICALS

BESIDES SPECIALLY DESIGNED P.G. PRACTICALS, M.Sc. STUDENTS PERFORM ALL UNDERGRADUATE PRACTICALS AND ALSO TEACH A FEW OF THESE PRACTICALS TO THE UNDERGRADUATES.

## 4. TEACHING MEETINGS:

SINCE M.Sc. STUDENTS MIGHT OPT FOR A TEACHING CAREER, THEY ARE OCCASIONALLY INVOLVED IN TEACHING UNDERGRADUATES. IN THE TEACHING MEETINGS, THE FORTHCOMING PRACTICAL EXERCISES ARE DISCUSSED, AND FEEDBACK ON RECENTLY HELD EXERCISES IS OBTAINED. THESE DISCUSSIONS ARE DESIGNED TO TUNE THE M.Sc. STUDENTS TO TEACHING AND RELATED ADMINISTRATIVE RESPONSIBILITIES. IN ADDITION, TEACHING MEETINGS ARE ALSO UTILIZED FOR DISCUSSION OF P.G. PRACTICALS, RESEARCH PROTOCOLS OF NEW P.G. STUDENTS, PRESENTATION OF THESIS WORK BY P.G. STUDENTS PRIOR TO SUBMISSION OF THE THESIS, AND ANY OTHER ITEMS OF INTEREST TO THE TEACHING AND RESEARCH STAFF OF THE DEPARTMENT.

## ASSESSMENT

IN THE FIRST THREE SEMESTERS, AN END-SEMESTER THEORY, PRACTICAL AND ORAL EXAMINATION IS CONDUCTED BY THE DEPARTMENT ON THE SYSTEMS COVERED DURING THE SEMESTER, AND A RECORD OF THE INTERNAL ASSESSMENT IS MAINTAINED. IN THE LAST (4TH) SEMESTER, THE STUDENTS TAKE THE FINAL M.Sc. EXAMINATION CONDUCTED BY THE UNIVERSITY.

## SUMMARY


A SUMMARY OF THE M.Sc.(MEDICAL) PHYSIOLOGY PROGRAM INCLUDES:

- ATTENDING UG CLASSES
- SEMINARS, J CLUBS & FACULTY PRESENTATIONS
- PG PRACTICALS
- TEACHING MEETINGS
- THESIS WORK
- ASSESSMENT

### SCHEME OF EXAMINATION . M.Sc.(MEDICAL) PART – II PHYSIOLOGY UNIVERSITY EXAMINATION

- A. Theory :** The written examination consist of three papers of 100 marks. Each paper will be of three hours duration. Question on recent Advances may be asked in any or all papers.

**Attested CTC**

  
15/2/2021  
Vice-Chancellor

Sumandeep Vidyapeeth  
An Institution Deemed to be University  
VIII. Piparia, Taluka: Waghodia.  
Dist. Vadodara-391 760. (Gujarat)



**Paper-1:**General Physiology ,Biopotential, Transport across membrane, Biophysical principles, Comparative physiology, History of Medicine with special reference to Physiology.

**Paper-2:** Systemic Physiology including applied aspects of blood, Respiratory Physiology, Cardiovascular, Digestive, Excretory systems, Exercise & Sports Physiology&Enviromental Physiology.

**Paper-3:**Systemic physiology including applied aspects of central Nervous system, Muscle & Nerve Physiology, Endocrines, Reproductive Physiology Special senses, Clinical Physiology, Chrono- Physiology , BehaviouralPhysilogy with Yoga and Meditation, Recent advances in Physiology.

**Each theory paper will consist of (Total four questions)**

Three Long Essay type question- 3 x 25 marks = 75

One Short note question 2 x 12.5 marks=25

Total marks 100

**B. Practical**

- |   |             |
|---|-------------|
| 1. (a) Human Experiment                     | --50 marks  |
| (B) FROGS / RABBIT / RAT                    | --25 MARKS  |
| 2. (a) Hematology                           | -- 30 marks |
| (B) DISCUSSION ON CHARTS/GRAPHS/PHOTOGRAPHS | 20 MARKS    |
| 3. Clinical Physiology                      |             |
| Clinical examination of a given subject     |             |
| Discussion on investigation                 |             |
| Interpretation of laboratory findings       |             |
| Physiological principles in diagnosis       | -- 50 marks |
| 4. Clinical Biochemistry                    | -- 25 marks |

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Total 200 marks

**C. Viva Voce**

- |  |             |
|--|-------------|
| 1. The Viva Voce would be on all components of SYLLABUS INCLUDING DISCUSSION ON DISSERTATION | -- 80 MARKS |
| 2. Pedagogy  | -- 20 marks |

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Total 100 marks

**D. Maximum marks for M.Sc.(Medical) Physiology Examination**

Theory	Practicals	Viva – Voce	Total
300	200	100	600

**Attested CTC**

**Passing Standard : 50%**

*Charaney*  
15/2/2021

**Vice-Chancellor**

**Sumandeep Vidyapeeth**

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