PHYSIOLOGY (NEP 2020)

Program Outcomes (PO)

P.O.1: Students will be enriched about the knowledge covering the functional activities of different physiological systems operating in co-ordinated fashion from molecular and cellular levels to the system levels.

P.O.2: Participants of this course will be empowered by perceiving information about the impact of environmental biotic and abiotic factors for the maintenance of homeostasis of human body.

P.O.3: Learners will be skilled and expertise themselves for doing biophysical and biochemical analysis of human body samples for assessment of health status and dissemination of public health awareness package to the community.

P.O.4: Learners will be skilled and expertise themselves for doing different haematological techniques for analysis of human blood samples.

P.O.5: Student will be oriented for cognitive power upgradation and problem solving activity in different biological deviated conditions in connection with acclimatization to real life situation.

P.O.6: Undergraduate students will themselves achieve integrated and interdependent knowledge among human body activities in collaborative manners with plant and animal kingdom in a holistic fashion.

P.O.7: Students will get idea about the different disease causing agents and their prevention; personal hygiene. They will also enrich about the knowledge of ideal nutrients and balanced diet.

P.O.8: Learners will skill themselves about the knowledge of different instruments like ECG, Chromatography, ELISA, RIA etc.

P.O.9: Statistical analysis and computer knowledge will help them better for future study and research work.

P.O.10: Biotechnological knowledge will help them advanced treatment for different genetic diseases, modern vaccination techniques etc.

Program Specific Outcomes (PSO)

P.S.O1: Will orient the students and attract them for pursuing higher studies in this line and for carrier building in the field of health sector, formal education sector, pharma industries, biotechnological corporate etc.

P.S.O2: Will facilitate the student for fundamental knowledge perception which will drive them to conduct further study in research in the field of allied health sciences, medical sciences, veterinary sciences and others.

P.S.O3: Will support the students for self-dependent learning and understanding to conduct experiments, knowledge bank enrichment and spreading the health awareness information through information-communication-technology.

P.S.O4: This course will provide a sound basis in human physiology to support further study in health and medical sciences or related fields. Development of practical knowledge and skills that is required for pursuing a career in clinical diagnosis, drug design, vaccine development, pharmaceutical industry.

P.S.O5: On working indifferent designing industry as an Ergonomist, in Defense Research Institute as Scientist and also at the Sports Training Institute as Sports Scientist/Physiologist.

PHYSIOLOGY
SEMESTER–I

Course Outcomes :

MJCCT-1: Cellular Basis of Physiology

- This course gives a wide knowledge about structure and functions of cell organelle.
- From this course students will gather the knowledge about the cell, tissue, organ and systems.
- The course would fortify to the students to acquire the knowledge about transport across cell membranes and intracellular communications.
- Theyacquireaconceptaboutcellcycle,celldivision,homeostasisandaging process

MJCCP-1:Cellular Basis of Physiology Lab

- From this course students will gather their knowledge about various parts of microscope.
- This practical course will provide wide range of knowledge about histological structure of different organs and glands.
- They will gather knowledge about structural morphology of different types of fresh tissue.

MINT-1: Cellular Physiology

- This course gives a wide knowledge about structure and functions of cell organelle.
- From this course students will gather the knowledge about the cell, tissue, organ and systems.
- The course would fortify to the students to acquire the knowledge about transport across cell membranes and intracellular communications.
- They acquire a concept about cell cycle, cell division, homeostasis and aging process.

MINP-1: Cellular Physiology Lab

- From this course students will gather their knowledge about various parts of microscope.
- This practical course will provide wide range of knowledge about histological structure of different organs and glands.
- They will gather knowledge about structural morphology of different types of fresh tissue.

MDT-1: Social Physiology

- This course gives a wide knowledge about structural and functional organization of different body systems.
- From this course students will gather the knowledge about the role different

nutrients and food on health management and disease prevention.

- The course would fortify to the students to acquire the knowledge about hygiene and health maintenance.
- They acquire a concept about the importance of physical activity, exercise, yoga and meditation on health.

SECP-1: Cytology and Hematological Techniques Lab

- This skill enhancement course learner will gain their knowledge about preparation of blood smear, staining along with identification of blood cells.
- From this paper students will increase their knowledge and techniques about total count of RBC and WBC.
- They acquire their skill for measurement of hemoglobin percentage and determination of haematocrit, MCV, MCH, MCHC, bleeding time and clotting time.
- Learner will fortify their skill on estimation of urea and creatinine in serum sample along with estimation of blood sugar level.

SEMESTER–II

Course Outcomes :

MJCT-2: Circulating Body Fluids

- From this course students will gain the knowledge about blood and its components.
- This course will enrich the learner about the morphology, classification and important function of formed elements.
- Student will acquire the knowledge on haemostatic mechanism and the clinical aspects of blood coagulation.
- The students will gain their knowledge on blood group, blood transfusion and its related health hazards.

MJCP-2: Circulating Body Fluids Lab

- The course content will develop skill of our students on hematological techniques.
- Student will gain the knowledge on total count of RBC and WBC.
- They will increase their skill on blood film preparation and staining procedure.
- Student will develop their knowledge on blood group detection and Rh typing.

MNT-2:Blood and BodyFluids

- From this course students will gain the knowledge about blood and its components.
- This course will enrich the learner about the morphology, classification and important function of formed elements.
- Students will acquire the knowledge on haemostatic mechanism and the clinical aspects of blood coagulation.
- The students will gain their knowledge on blood group, blood transfusion and

its related health hazards.

MNP-2: Blood and Body Fluids Lab

- The course content will develop skill of our students on hematological techniques.
- Student will gain the knowledge on total count of RBC and WBC.
- They will increase their skill on blood film preparation and staining procedure.
- Students will develop their knowledge on blood group detection and Rh typing.

MDT-2: Environmental Physiology and Human Health

- This course will help our students to enhance their skill to measure dissolved oxygen in water sample.
- They will be able to measure relative humidity and suspended particulate matter in air.
- Lerner will also get their skill to measure noise and light intensity of different working places.
- From this discipline specific elective course student will also develop their ability to soil pH in different climatic areas.

SECT-1: Clinical Biochemistry

- Student will be developing their hands of knowledge on principle and application of colorimeter and spectrophotometer.
- Learner will gain their ideas on pathophysiological significance of blood parameters.
- From this course learners will acquire their knowledge on pathological significance of some enzymes and proteins.

SEMESTER–III

Course Outcomes:

CT-5: Circulating Body Fluids

- From this course students will gain the knowledge about blood and its components.
- This course will enrich the learner about the morphology, classification and important function of formed elements.
- Student will acquire the knowledge on hemostatic mechanism and the clinical aspects of blood coagulation.

The students will gain their knowledge on blood group, blood transfusion and its related health hazards.

CP-5: Circulating Body Fluids Lab

- The course content will develop skill of our students on hematological techniques.
- Student will gain the knowledge on total count of RBC and WBC.
- They will increase their skill on blood film preparation and staining procedure.
- Student will develop their knowledge on blood group detection and Rh typing.

CT-6: Circulation

- Student will be able to learn about structure and function of cardiovascular system.
- From this course learners will gather knowledge about origin and spread of cardiac impulse along with properties of cardiac muscle.
- They will acquire their knowledge about the electrocardiogram and its clinical correlation with different cardiac abnormalities.

- This core paper will enrich our students about hemodynamics and blood pressure.
- From this core course learner will gain their knowledge about different regional circulation with peculiarities.

CP-6: Circulation Lab

- The students will be aware on accuracy in artificial fluid preparation with the importance of components in experimental animal as toad.
- They will increase their skill on perfusion experiment using cholinergic and adrenergic drugs partnering cardiac activities of toad.
- Student will be able to gather preliminary idea on ECG recording and interpretation through demonstration model.

CT-7: Functions of the Nervous System

- From this core course students will gain their knowledge about elementary ideas on CNS, PNS and ANS.
- They will have specific knowledge on human body's reflexogenic activities and their control measures.
- The learner will get information regarding various central nervous system components, their integrating mechanism of action as well as abnormal neural function.
- The students will gain their knowledge on higher function of nervous system and reasons of behavioral scenario.

CP-7: Functions of the Nervous System Lab

- The learner will enhance their skill through various reflex related functioning of human body with their normal and abnormal interpretation.
- They will increase their skill on upper extremity muscular strength.

GET-3: Digestion, Metabolism, Nutrition and Excretion

- From this core course students will gather knowledge about digestion and absorption of principle food stuff.
- They will develop their knowledge in carbohydrate, protein and fat metabolism and their integrated pathway.
- Student will develop their knowledge about basic components of food with their nutritional values along with nutritional assessment in different food stuff.
- Developing the knowledge how excretory system functioning.

GEP-3: Digestion, Metabolism, Nutrition and Excretion Lab

- This practical paper will help to increase the ability of students in qualitative and quantitative importance of physiologically important biomolecules.
- Student will develop their skill in the titration process with high level of accuracy.

SECP-1: Detection of Food Adulteration Lab

- This course will provide specific idea about nanoscience and nano-biotechnology.
- This course will fortify our student to develop their knowledge on characterization of nanomaterials.
- They will get information about application of nanomaterials in modern science and cancer therapy.
- Student will gather their knowledge about loading and unloading of desired substances to and from the nano-particle.
- This course will also provide basic concept of bioinformatics with different major bioinformatic resources.

SECP-1: Hematological Techniques Lab

- This skill enhancement course learner will gain their knowledge about preparation of blood smear, staining along with identification of blood cells.
- From this paper students will increase their knowledge and techniques about total count of RBC and WBC.
- They acquire their skill for measurement of hemoglobin percentage and determination of haematocrit, MCV, MCH, MCHC, bleeding time and clotting time.
- Learner will fortify their skill on estimation of urea and creatinine in serum sample along with estimation of blood sugar level.

SEMESTER – IV

Course Outcomes:

CT-8: Energy Balance, Metabolism and Nutrition

- From this core course student will learn about energy balance along with redox potential.
- Learner will also gain their knowledge about intracellular biochemical events in relation with carbohydrate, protein and fat metabolism.
- Student will be able to gather preliminary idea on human nutrition, physiological importance of vitamins and minerals.

CP-8: Energy Balance, Metabolism and Nutrition Lab

- This course will help to increase the knowledge of our student about colorimetry.
- Lerner will develop their skill on quantitative estimations of biologically important molecules.
- They will also gain their knowledge about clinical importance of biomolecules.

CT-9: Gastrointestinal Physiology

- From this core course students will gain their knowledge about elementary ideas on different parts of gastrointestinal tract, liver, gall bladder and billary system.

- They will get detail knowledge on digestion and absorption of carbohydrate, protein and lipid.
- The learner will know about normal microbial flora and their clinical importance.

CP-9: Gastrointestinal Physiology Lab

- The learner will get knowledge about preparation of Dale's fluid.
- They will enhance their ability on recording of normal intestinal movement of rat in Dale's bath.
- Student will gain knowledge about effects of hypoxia, acetylcholine and adrenaline on normal intestinal movements.

CT-10: Respiratory Physiology

- From this core course students will get knowledge about pulmonary function and gaseous exchange.
- They will gather specific knowledge on regulation of breathing.
- The students will gain their knowledge about clinical aspects of breathing.

CP-10:Respiratory Physiology Lab

- The learner will enhance their skill on lung function test.
- Fromthiscorecoursetheywilllearnhowtomeasureoxygensaturationofblood.
- Student will be able to increase their skill on pneumographic recording of chest movement during different types of physical activities.

GET-4: Neurosensory, Endocrine and Reproductive Systems

- Studentwillacquiretheirknowledgeaboutstructureandfunctionofnervoussystema ndtheir higher centre for controlling different sensory and motor activities.
- From this course student will learn about structure and functions of special sensory organs.
- Learner will develop their understanding on the basic concept on endocrine system anatomically and histologically.
- To gather knowledge about chemical messenger actions in physical and chemical coordinated function in our body including hyper and hypoactive conditions.
- They will develop important information about male and female reproductive systems.

GEP-4: Neurosensory, Endocrine and Reproductive Systems Lab

- The readers will be able to measure visual function with different errors and their preventive measures.
- Student will develop their skill on histology elated laboratory staining techniques and

identification of respective male and female reproductive tissues.

- This practical paper help sour students how to handle kymograph.
- Lerner will grow their knowledge about pathophysiological state on hyper and hypo active states of endocrine glands.

SECT-1: Clinical Biochemistry

- Student will be developing their hands of knowledge on principle and application of colorimeter and spectrophotometer.
- Learner will gain their ideas on pathophysiological significance of blood parameters.
- From this course learners will acquire their knowledge on pathological significance of some enzymes and proteins.

Or

SECT-1: Clinical Microbiology and Bio-Medical Technology

- Lerner will develop their knowledge on clinical microbiology along with biomedical instrumentation and different modern techniques.
- They will also learn about how to handle sample of infectious disease and their precautionary measures.
- From this course student will fortify their knowledge on bacterial growth curve, generation time along with different type of culture media.
- Student will develop their ideas about principle and application of modern biomedical instrumentation.

SEMESTER–V

Course Outcomes:

CT-11: Special Senses

- From this core course students will gain their knowledge about elementary ideas on visual process, photochemical changes of retina and errors in visual process.
- They will gather specific knowledge about auditory pathway and equilibrium of hearing process.
- The students will also know about the physiology behind smell and taste perception.

CP-11: Special Senses Lab

- The learner will increase their abilities in fixation and staining process of nervous tissue.
- They will develop their skill to measure visual acuity, colour blindness and tuning fork test for deafness.
- Student will be able to gather preliminary idea on audiometry through demonstration.

CT-12:Endocrinology

- From this core course students will develop their knowledge about elementary

idea on endocrine glands.

- Learner will gather specific knowledge on chemical nature, mode of action of different hormones.
- The students will acquire knowledge about biological functions of different hormones.
- They will also get information regarding pathophysiology of endocrine glands.
- Students will also learn about bone physiology with regulation of blood calcium level.

CP-12: Endocrinology Lab

- Student will increase their ability to record the effect of oxytocin and adrenalin on uterine movement of rat.
- The learner will enhance their skill to determine obesity using anthrpometric parameters.
- They will increase their skill on quantification of blood calcium level.
- Student will be able to identify specific pathophysiological disorders of endocrine system.

DSET-1:Biostatistics and Computer Application

- The course will enable the students to develop their knowledge about principle and application of statistics in biology.
- This core course will fortify the students to learn about statistical sampling, frequency distribution and graphical representation of data.
- The course will strengthen the students within-depth on statistical analysis of dispersion.
- This course will provide the students better understanding on Student's t-distribution, probability and hypothesis of biostatistics.

DSEP-1:Biostatistics and Computer Application Lab

- This practical course will enable students to calculate statistical data, collected from field study.
- This practical course will fortify the students to develop their skill for preparing project report

Or

DSET-1: Human Nutrition and Dietetics

- This core course will enrich our students to develop their knowledge about health and nutrition of community.
- This course will fortify our students to learn about dietary requirements, calory requirements and biological value of nutrients.
- This course will enable our students to grow up their knowledge about the basic principle of diet chart preparation for growing child, adult man and woman, pregnant and lactating mother.
- They will get knowledge about physiological importance of vitamin and minerals.

DSEP-1: Human Nutrition and Dietetics Lab

- This practical course will develop students' ability to collect nutritional data for the preparation of diet survey report.

- This practical course will fortify the students to develop their skill for preparing field survey report.

DSET-2: Microbiology and Immunology

- From this core course student will develop their knowledge about microbes and its growth along with different types of classification.
- This course will fortify our students to develop their knowledge about bacterial metabolism, conjugation, transformation and transduction.
- They will get elementary idea of bacteriostatic, bactericidal agents and antibiotics.
- This course will provide knowledge aboutCOVID-19.
- Students will improve their knowledge about cell-mediated and humoral-immunity.
- Learner will get information on universal protocol of immunization against communicable diseases.

DSET-2: Microbiology and Immunology Lab

- This practical course will enable our students to develop their knowledge on staining and identification of Gram positive and Gram-negative bacteria.
- The core course will fortify the students to develop their skill for preparing bacterial culture media.
- Learner will gain their knowledge on blood group detection and Rhtyping.
- They acquire their ideas on radio-immuno-diffusion and Acid-fast staining of bacteria through demonstration process.

DSEP-2: Genetics and Molecular Biology Lab

- This practical course will provide wide range of knowledge about retrieval of amino acid sequence from mRNA.
- Students will gain their knowledge on retrieval of codogen in DNA from codon sequence of mRNA.
- The discipline specific elective course will fortify the students to develop their skill about extraction of DNA and RNA from supplied sample.
- Learner will gain their skill about quantification of protein.

SEMESTER–VI

Course Outcomes:

CT13: Reproduction

- The students will grow their knowledge on human reproduction and its associated abnormalities.
- Learner will also enriched with knowledge about population control and family planning.
- They will earn about basic concept of menstruation and its hormonal control along with abnormalities.
- From this course our learners will earn about physiology of pregnancy, parturition and lactation.

CP13: Reproduction Lab

- The student will develop their skill to study of estrous cycle.
- Learner will increase their ability on staining and identification of testicular and ovarian

tissue.

- They will be able to perform pregnancy test by immunological method.
- Student will also improve their knowledge about reproductive health by performing semen analysis.

CP14: Excretion, Skin and Body Temperature Regulation

- From this course the learner will study on excretory system with special emphasis electrolytes and water balance of the human body.
- They will also get information about non-excretory functions of kidney.

Physiology of sweating

- This course will help to gather knowledge about regulation of body temperature and its associated abnormalities.

CP14: Excretion, Skin and Body Temperature Regulation Lab

- The learner will get their ability to perform routine examination of urine to identify abnormal constitutions.
- Student will grow their skill to perform microscopic examination of urine also to identify RBC, pus cell, cast etc.
- They will enhance their ability to identify their relation between exercise, heart rate and body temperature.

DSET-3: Ergonomics and Occupational Physiology

- From this core course students will develop their knowledge about physiological work load, concept of work rest cycle and its significance
- Studentwilllearnaboutrelation-shipofman-machine-environmentinworkplacesforsafetyandwellbeing.
- Student will gather the knowledge how to reduce the occupational health hazards and on industrial safety devices.

DSEP-3: Ergonomics and Occupational Physiology Lab

- Students will develop their skill to measure about working heart rate by ten beats methods.
- Learners will increase their ability to explain the relationship between blood pressure and graded exercise with their practical knowledge.
- They will also get their skill to measure different anthropometric parameters along with calculation of BSA and BMI.
- From this core course learners will develop their ability to measure relative humidity and noise level at work place.

Or

DSET-3: Environmental Physiology and Toxicology

- From this discipline specific course students will develop their knowledge on environmental pollution and its health hazards.
- They will develop their ideas on radioactive pollution and concept of hygiene, sanitization and their impact on public health.
- Learner will grow their knowledge on air, water and food borne diseases and also food additive and food adulteration along with vector borne epidemic diseases.
- Student will gain their knowledge on environmental management, environmental

ethics, conservation and different Acts and its importance.

- This course will help our students to enhance their skill to measure dissolved oxygen in water sample.
- They will be able to measure relative humidity and suspended particulate matter in air.
- Lerner will also get their skill to measure noise and light intensity of different working places.
- From this discipline specific elective course student will also develop their ability to soil pH in different climatic areas.

DSET-4: Sports and Exercise Physiology

- From this course students will develop their knowledge on Sports and Exercise Physiology.
- This course will fortify our student to develop their knowledge on Physiological work and endurance activity.
- Learner will learn about role of exercise and training on health and wellbeing.
- Student will gather their knowledge about cardio-respiratory responses during different grades of exercise.
- This course will also provide basic concept of bioenergetics with different sources of energy during exercise.

DSEP-4: Sports and Exercise Physiology Lab

- From this course students will develop their skill on measurement and interpretation of blood pressure.
- Student will increase their ability to determine Physical Fitness Index and to record recovery pulse rate after dynamic and static exercise.
- They will also be able to calculate endurance time by handgrip dynamometer.
- Learner will develop their knowledge to determine $VO_{2\,max}$ by Queen College Step Test.

Or

DSET-4: Nano-biotechnology and Bioinformatics

- This course will provide specific idea about nanoscience and nano-biotechnology.
- This course will fortify our student to develop their knowledge on characterization of nanomaterials.
- They will get information about application of nanomaterials in modern science and cancer therapy.
- Student will gather their knowledge about loading and unloadingof desired substances to and from the nano- particle.
- This course will also provide basic concept of bioinformatics with different major bioinformatic resources.