

Physiology Programme Outcome & Course Outcome

	Objective of Programme / Course Outcome	Employability of Programme / Course	Attainment of Programme / Course Outcome
Courses	UG: Semester I		
SH/PHY/101/C-1: Cellular Basis of Physiology	<p>CO1: Student will learn about different body fluid components, body organ system, cell organelles, tissue-organ system, cellular physiology, transport system in human body across the cell membrane, intracellular communication between cells in human body, cell cycle, cell division, homeostasis and physiology of ageing.</p> <p>CO2: Student will gain practical knowledge about identification of stained sections of different mammalian tissues and organs.</p>	Students who complete this programme can find employment in Schools, Colleges and University teaching, in pathological laboratory for blood constituent determination and tissue section identification.	Usually we take traditional classroom teaching, ICT classes, project work, guided reading, and practical classes to learn individually.
SH/PHY/102/C-2: Biological Physics and Enzymes	<p>CO3: Student will learn about basic concepts of biophysics such as solution, bonds and forces between bio-molecules, colloid, surface tension, osmosis, diffusion, biological aspects of flow and pressure, dialysis, chromatography, electrophoresis, cell fractionation, nanoparticles, thermodynamics and enzyme kinetics.</p> <p>CO4: Student will gain practical knowledge about blood pressure measurement of human volunteer and determination of enzymatic activity of biological sample.</p>	Students become enrich through this programme for their further study. There is huge research scope on nanoparticles, enzymes, even in pharmaceutical fields.	We provide traditional classroom teaching, ICT classes, project work, guided reading, practical classes and modern laboratory instrument handling (Colorimeter, spectrophotometer etc) to learn individually.
SH/PHY/103/GE-1: Community and Public Health	CO5: Student will learn about basic concepts about community and public health	Students who complete this programme can find employment in SSC jobs.	We provide traditional classroom teaching, ICT classes, project work,

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	<p>issues, nutritional values of common Indian foodstuffs, calorie requirement, diet management of obese, diabetic, hypertensive person and athletes, sound pollution and community health issues.</p> <p>CO6: Student will gain practical knowledge about qualitative assessment of noise, preparation of survey report of dietary intake in the surroundings area, field survey on immunization, role of ICDS/Anganwadi and Mid-day Meal programme.</p>	<p>There is more research scope on Community health, nutritional assessment of any area.</p>	<p>guided reading, practical classes and laboratory instrument handling (Sound Level Meter) to learn individually.</p>
<p>SP/PHY/101/C-1A: Physiological Aspects of Community Health</p>	<p>CO7: Student will learn about basic concepts about community and public health issues, nutritional values of common Indian foodstuffs, calorie requirement, diet management of obese, diabetic, hypertensive person and athletes, sound pollution and community health issues.</p> <p>CO8: Student will gain practical knowledge about qualitative assessment of noise, preparation of survey report of dietary intake in the surroundings area, field survey on immunization, role of ICDS/Anganwadi and Mid-day Meal programme.</p>	<p>Students who complete this programme can find employment in school teaching. There is immense research scope on Community health, nutritional assessment of any area.</p>	<p>Usually we take traditional classroom teaching, ICT classes, project work, guided reading, practical classes and laboratory instrument handling (Sound Level Meter) to learn individually.</p>
UG: Semester II			
<p>SH/PHY/201/C-3: Physiology of Nerve and Muscle cells</p>	<p>CO9: Student will learn about physiology of nerve and muscle, synaptic and neuro muscular junctional transmission, neurotransmitter chemistry, and initiation of impulses in sense organs.</p>	<p>Students become enrich through this programme for their further study. There are immense research scope in neurophysiology, drug dose measurement etc.</p>	<p>We use a combination of traditional classroom teaching, ICT classes, project work, guided reading, practical classes and modern laboratory instrument handling,</p>

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	CO10: Student will achieve practical knowledge about the instrument used to study the mechanical responses of skeletal muscle, isolation and staining of nerve fibre and muscle fibre, and calculation of measurement of different effect in normal and effected heart curve.		drug doses application on amphibian and mammalian specimens.
SH/PHY/202/C-4: Chemistry of Biomolecules	CO11: Student will learn about basic concepts of bio-molecule chemistry such as carbohydrates, proteins, lipids, DNA and RNA. CO12: Student will achieve practical knowledge about qualitative assessment of physiologically important bio-molecules.	Biochemical field has enough research scope in every angle.	We afford traditional classroom teaching, ICT classes, project work, guided reading and practical classes.
SH/PHY/203/GE-2: Developmental Biology and Embryology	CO13: Student will learn about basic concepts of human reproductive system, gametogenesis, fertilization, blastula formation, gastrulation and Organogenesis. CO14: Student will achieve practical knowledge about hematoxyline and eosin staining of ovarian tissue section, and demonstration of mammalian embryo preservation.	Students who complete this programme can find employment in SSC jobs. There is sufficient research scope on reproductive physiology branch.	We provide traditional classroom teaching, ICT classes, guided reading and practical classes.
SP/PHY/201/C-1B: Developmental Aspects of Embryo and Foetus	CO15: Student will learn about basic concepts of human reproductive system, gametogenesis, fertilization, blastula formation, gastrulation and Organogenesis.	Students who complete this programme can find employment in school teaching. There is enough research scope on reproductive physiology branch.	We afford traditional classroom teaching, ICT classes, guided reading and practical classes.

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	CO16: Student will achieve practical knowledge about hematoxylene and eosin staining of testicular and ovarian tissue sections, and demonstration of mammalian embryo preservation.		
UG: Semester III			
SH/PHY/301/C-5: Circulating Body Fluids	<p>CO17: Student will learn about components and function of blood, bone marrow, immune mechanisms, blood grouping and Rh typing, hemostasis, physiology of lymph. And clinical implication of different components of blood.</p> <p>CO18: Student will achieve practical knowledge about preparation and staining of blood film, identification of blood cells, haemoglobin estimation, bone marrow staining and blood group determination and Rh typing.</p>	Students who complete this programme can find employment in SSC jobs and in pathological laboratory (Haematological field). Students also become enrich about his/ her blood composition.	We give traditional classroom teaching, ICT classes, project work, guided reading and practical classes.
SH/PHY/302/C-6: Circulation	<p>CO19: Student will learn about origin of the heart beat and the electrical activity of the heart, dynamics of blood and lymph, cardiovascular regulatory mechanisms, special regional circulations, cardiovascular homeostasis in health and disease.</p> <p>CO20: Student will achieve practical knowledge about preparation of ringer lock solution, effect of temperature, fluid pressure and excess ion, acetylcholine, adrenaline on the movement of perfused heart of toad, and</p>	Students become enrich through this programme for their further study. There is immense research scope in haematology field. They also get job in School teaching.	We afford traditional classroom teaching, ICT classes, project work, practical classes and modern laboratory instrument handling (ECG machine etc), drug doses application on amphibian and mammalian specimens.

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	interpretation of ECG recording graph.		
SH/PHY/303/C-7: Function of the Nervous System	<p>CO21: Student will learn about functions of the nervous system such as reflexes, sensory and motor pathways, mechanism of sleep, electrical activity of brain, posture and movement, neural basis of instinctual behaviour and emotions.</p> <p>CO22: Student will achieve practical knowledge about superficial and deep reflexes hand grip strength, reaction time by stick drop test, memory test, and two point discrimination test.</p>	Students get enrich through this programme for their further study. There are huge research scope in neurophysiology, drug dose measurement etc.	Usually we provide traditional classroom teaching, ICT classes, project work, guided reading, practical classes and modern laboratory instrument handling, drug doses application on amphibian and mammalian specimens.
SH/PHY/305/SEC-1: Detection of Food Adulteration	CO23: Student will achieve practical knowledge about qualitative tests for identifying food adulterants in food samples.	Students become self confident about purity of food materials. They can easily detect faulty food stuffs in laboratory and can find job in Government sectors as Assistant.	We provide traditional classroom teaching, ICT classes, project work, guided reading, practical classes and modern laboratory safety system techniques.
SH/PHY/304/GE-3: Environmental Pollution and Human Health	<p>CO24: Student will learn about causes, health hazards and managements of air, water, soil, sound, radionuclide and arsenic pollution.</p> <p>CO25: Student will achieve practical knowledge about effect of temperature on cardiac rhythm, determination of particulate matter in air sample, measurement of dissolved oxygen, measurement of noise by sound level meter, measurement of p^H of soil.</p>	Students who complete this programme can find employment in school teaching. There is enough research scope on Environmental physiology and health hazards branch.	We provide traditional classroom teaching, ICT classes, project work, guided reading, practical classes and laboratory instrument handling (Sound Level Meter, p ^H meter) to learn individually.
SP/PHY/301/C-1C:	CO26: Student will learn	Students who complete	We provide traditional

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<p>Environmental Hazards and Human Physiology</p>	<p>about causes, health hazards and managements of air, water, soil, sound, radionuclide and arsenic pollution.</p> <p>CO27: Student will achieve practical knowledge about effect of temperature on cardiac rhythm, determination of particulate matter in air sample, measurement of dissolved oxygen, measurement of noise by sound level meter, measurement of p^H of soil.</p>	<p>this programme can find employment in school teaching and can find job in PHE departments. There is enough research scope on Environmental physiology and health hazards branch.</p>	<p>classroom teaching, ICT classes, project work, guided reading, practical classes and laboratory instrument handling (Sound Level Meter, p^H meter) to learn individually.</p>
<p>SP/PHY/304/SEC-1: Food Pollutants Lab</p>	<p>CO28: Student will achieve practical knowledge about qualitative tests for identifying food adulterants in food samples.</p>	<p>Students become self confident about purity of food materials. They can easily detect faulty food stuffs and can find job in Government Laboratories on food quality detection.</p>	<p>We give traditional classroom teaching, ICT classes, project work, guided reading, practical classes and idea on modern laboratory safety system techniques.</p>
<p>UG: Semester IV</p>			
<p>SH/PHY/401/C-8: Energy Balance, Metabolism, and Nutrition</p>	<p>CO29: Student will learn about energy metabolism, metabolism of carbohydrate, protein, fat and cholesterol, and nutritional science to some extent.</p> <p>CO30: Student will achieve practical knowledge on application of colorimetry, quantitative estimation of glucose, amino nitrogen, and percentage quantification of lactose in milk.</p>	<p>Students get enrich through this programme for their further study. There is immense research scope in biochemistry field. They also get job in SSC jobs.</p>	<p>We apply traditional classroom teaching, ICT classes, project work, guided reading, practical classes and modern laboratory safety system techniques.</p>
<p>SH/PHY/402/C-9: Gastrointestinal Function</p>	<p>CO31: Student will learn about gastrointestinal tract function such as digestion, absorption, and regulation of gastrointestinal function.</p> <p>CO32: Student will achieve</p>	<p>Students become enrich through this programme for their further study. There is enough research scope in this field. They also get job in School teaching.</p>	<p>We provide traditional classroom teaching, ICT classes, project work, guided reading, practical classes and modern laboratory instrument handling, drug doses</p>

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	practical knowledge on application of Dale's apparatus, kymographic recording of normal movement of rat's intestine, and effect of hypoxia, acetylcholine, and adrenaline on normal intestinal movement.		application on amphibian and mammalian specimens.
SH/PHY/403/C-10: Respiration	CO33: Student will learn about pulmonary function, gas transport between the lungs and the tissues, regulation of respiration, respiratory adjustments in health and diseases. CO34: Student will achieve practical knowledge on measurement of peak expiratory flow rate, O ₂ saturation by pulse oxymeter, forced expiratory volume and lung function test.	Students who complete this programme can find employment in SSC jobs. They can also get information about their status on respiratory system effectiveness.	We give traditional classroom teaching, ICT classes, project work, guided reading and practical classes.
SH/PHY/405/SEC-2: Clinical Biochemistry	CO35: Student will achieve theoretical knowledge about photo-colorimetric estimation of blood glucose, blood inorganic phosphate, serum total protein, albumin globulin ratio and serum amylase activity.	Students become enrich through this programme for their future study. There is a lot research scope in clinical biochemistry field. They also get job in biochemical laboratory in different academic institutions and pathological laboratory.	We give traditional classroom teaching, ICT classes, project work, guided reading, practical classes on modern laboratory techniques for human blood analysis.
SH/PHY/404/GE-4: Biotechnology	CO36: Student will learn about basic idea of biotechnology such as it's importance, cloning, gene therapy, hybridoma, monoclonal antibody, DNA fingerprinting, PCR, RT-PCR, and tissue culture. CO37: Student will achieve	Students get enrich through this programme for their further study. There is huge research scope in Molecular Biology and Biotechnology field. They also get job in SSC jobs.	Usually we provide traditional classroom teaching, ICT classes, project work, guided reading, practical classes and ideas on modern laboratory safety system techniques.

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	practical knowledge on identification of molecular weight of protein, identification of base pair of DNA, DNA and RNA quantification, measurement of concentration of CT-DNA in a solution.		
SP/PHY/401/C-1D: Bio-engineering	CO38: Student will learn about basic idea of history of biotechnology, it's importance, cloning, gene therapy, hybridoma, monoclonal antibody, DNA fingerprinting, PCR, RT-PCR, and tissue culture. CO39: Student will achieve practical knowledge on identification of molecular weight of protein, identification of base pair of DNA, and DNA and RNA quantification.	Students become enrich through this programme for their further study. There is immense research scope in Molecular Biology, Biotechnology and Bio-engineering field. They also get job in School teaching.	We provide traditional classroom teaching, ICT classes, project work, guided reading, practical classes and ideas on modern laboratory safety system techniques.
SP/PHY/404/SEC-2: Methods in Hematology Lab	CO40: Student will learn about preparation of blood smear, identification of blood cells, determination of hematocrit, MCV, MCH, MCHC, bleeding time, clotting time, measurement of haemoglobin, and demonstration of enzymatic assay of SGOT and SGPT.	Students who complete this programme can find employment in school teaching and in pathological laboratory (Haematological field). Students also become enrich about his/ her blood composition.	Usually we provide traditional classroom teaching, ICT classes, project work, guided reading and practical classes.
UG: Semester V			
SH/PHY/501/C-11: Special Senses	CO41: Student will learn about special senses of human body like vision, hearing, smell and taste. CO42: Student will achieve practical knowledge on staining and identification of fixed nervous tissue, determination of visual acuity,	Students get enrich through this programme for their further study. There are immense research scope in neurophysiology, Clinical detection of sense organ deformity etc.	Usually we provide traditional classroom teaching, ICT classes, project work, modern charts, guided reading, practical classes on modern laboratory instruments like audio meter, perimeter etc.

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	colour blindness, and application of perimetry and audiometry.		
SH/PHY/502/C-12: Endocrinology	<p>CO43: Student will learn about different endocrine glands present in human body such as thyroid, pancreas, adrenal, pituitary, pineal and their control and metabolism of calcium and physiology of bones.</p> <p>CO44: Student will achieve practical knowledge on effects of oxytocin on uterine contraction, effect of adrenaline on intestinal and uterine movement, and also growth chart interpretation.</p>	Students become enrich through this programme for their further study. There is enough research scope in endocrinology.	We provide traditional classroom teaching, ICT classes, project work, guided reading and practical classes.
SH/PHY/503/DSE-1: Biological Statistics	<p>CO45: Student will enrich their knowledge on biological statistics.</p> <p>CO46: Student will achieve practical knowledge on application of biological statistics.</p>	Students can apply their knowledge for statistical analysis in research. They also do master degree (M. Sc) in this subject for future study.	We give traditional classroom teaching, ICT classes, project work, statistical problems etc.
SH/PHY/504/DSE-2: Microbiology and Immunology	<p>CO47: Student will learn about structure of virus and bacteria, bacterial growth curve, pathogenic and non-pathogenic bacteria, structure of immunoglobulins, humoral and cell mediated immunity, cytokines, lymphokines, vaccination and immunization programme.</p> <p>CO48: Student will achieve practical knowledge on Gram staining, spore staining and blood grouping and Rh typing.</p>	Students get enrich through this programme for their future study. Microbiology has huge research scope.	We afford traditional classroom teaching, ICT classes, project work, guided reading, practical classes on culture media preparation etc.
SP/PHY/501/DSE-1A: Clinical Microbiology and Immunology	CO49: Student will learn about structure of virus and bacteria, bacterial growth curve, pathogenic and non-	Students become enrich through this programme for their future study. Microbiology and	We afford traditional classroom teaching, ICT classes, project work, guided reading, practical

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	<p>pathogenic bacteria, bacteriostatic and bactericidal agents, lytic and lysogenic cycle of virus, immunity, structure of immunoglobulins, humoral and cell mediated immunity, cytokines, lymphokines, vaccination and immunization programme, and autoimmune diseases.</p> <p>CO50: Student will achieve practical knowledge on Gram staining, and demonstration of spore staining and Radial immune-diffusion.</p>	Immunology has huge research scope.	classes on culture media preparation etc.
<p>SP/PHY/504/SEC-3: Clinical Microbiology and Laboratory Medicine</p>	<p>CO51: Student will learn theoretical knowledge about gram staining, identification of tubercular bacteria in sputum, working procedure of ECG machine, centrifuge, spectrophotometer and colorimeter.</p>	Students who complete this programme can find employment in school teaching and in pathological laboratory (Serology field).	We afford traditional classroom teaching, ICT classes, project work, guided reading, practical classes on culture media preparation etc.
UG: Semester VI			
<p>SH/PHY/601/C-13: Reproduction</p>	<p>CO52: Student will learn about human reproductive system to some extent like sex differentiation and development, male and female reproductive system, fertilization, implantation, placenta, parturition, and hormonal regulation of pregnancy.</p> <p>CO53: Student will achieve practical knowledge on study of oestrous cycle, determination of pregnancy from human urine by kit method, and staining and identification of testis, ovary and uterus.</p>	Students become enriched through this programme for their further study. There is huge research scope in this field. They also get job in School teaching.	We provide traditional classroom teaching, ICT classes, project work, guided reading and practical classes.
<p>SH/PHY/602/C-14:</p>	<p>CO54: Student will learn</p>	Students get enriched	We afford traditional

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<p>Formation and Excretion of Urine</p>	<p>about human excretory physiology including formation of urine, mechanism of urinary bladder filling and emptying, non-excretory function of urine, diuretics and renal diseases.</p> <p>CO55: Student will achieve practical knowledge on microscopic observation of RBC, pus cell and cast in urine, and identification of abnormal constituents of urine.</p>	<p>through this programme for their further study. There is immense research scope in this field. They also get job in School teaching.</p>	<p>classroom teaching, ICT classes, project work, practical work on routine analysis of urine etc.</p>
<p>SH/PHY/603/DSE-3:</p> <p>(i) Ergonomics and Occupational Physiology</p> <p style="text-align: center;">Or</p> <p>(ii) Environmental Physiology</p>	<p>CO56(i): Student will enrich their knowledge on ergonomics and occupational physiology as a whole in which proper man for proper job, productivity, profit and loss and and health hazards plus their managements are concerned.</p> <p>CO56(ii): Student will enrich their knowledge on toxicology, food toxicants, environmental pollution and health hazards, environmental pollution and human health hazards, and environmental management.</p> <p>CO57(i): Student will achieve practical knowledge on blood pressure measurement after different grades of exercise, measurement of anthropometric parameters, measurement of noise level.</p> <p>CO57(ii): Student will achieve practical knowledge on measurement of relative humidity, LD₅₀, light intensity, and noise intensity.</p>	<p>(i) Students get enrich through this programme for their further study. There is a lot research scope in this field. Ergonomics is human engineering. By applying ergonomical principles low production cost and more productivity can be possible. Man-Machine environment can be adjusted, occupational hazards can be detected and prevented.</p> <p>(ii) Environmental physiology has huge scope in research work and environmental condition determination.</p>	<p>Usually we provide traditional classroom teaching, ICT classes, project work, field base practical classes, direct interaction with the workers etc.</p>

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<p>SH/PHY/604/DSE-4: Sports and Exercise Physiology</p>	<p>CO58: To enrich the knowledge on sports and exercise physiology and occupational health hazards.</p> <p>CO59: Student will achieve on measurement blood pressure after different grades of exercise, physical fitness index, body fat percentage, endurance time by hand grip dynamometer.</p>	<p>Students become enrich through this programme for their further study. There is immense research scope in this field. Sports Physiology has a scope to further study in sport medicine, which is now a days more important in different sports.</p>	<p>We give traditional classroom teaching, ICT classes, project work, guided reading, field based practical classes.</p>
<p>SP/PHY/601/DSE-1B: Exercise and Sports Physiology</p>	<p>CO60: To enrich the knowledge on sports and exercise physiology and occupational health hazards, bioenergetics, post exercise oxygen consumption, physiology of fatigue an recovery, training to improve aerobic and anaerobic power, sport's injury.</p> <p>CO61: Student will achieve on measurement blood pressure and heart rate after different grades of exercise, physical fitness index, body fat percentage, grip strength by hand grip dynamometer and pneumographic recordings.</p>	<p>Students get enrich through this programme for their further study. There is huge research scope in this field. Sports Physiology has a scope to further study in sport medicine, which is now a days more important in different sports.</p>	<p>We give traditional classroom teaching, ICT classes, project work, guided reading, field based practical classes.</p>
<p>SP/PHY/604/SEC-4: Applied Biochemistry</p>	<p>CO62: Student will achieve theoretical knowledge about photo-calorimetric estimation of blood glucose, blood inorganic phosphate, serum total protein, albumin globulin ratio and serum amylase activity.</p>	<p>Students become enrich through this programme for their future study. There is huge research scope in clinical biochemistry. They also get job in biochemical laboratory in different academic institutions and pathological laboratory.</p>	<p>Usually we provide traditional classroom teaching, ICT classes, project work, guided reading, practical classes on modern laboratory techniques for human blood analysis.</p>

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