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Syllabus

for
3 Year Full Time B.Voc Degree Course
in

Multi Skilled Health Worker

NSQF level	Skill Component Credits	General Education Credits	Total Credits for Award	Normal Duration	Exit Points / Awards
5	36	24	60	Two Semesters	Diploma
6	72	48	120	Four Semesters	Advanced Diploma
7	108	72	180	Six Semesters	B Voc degree

Year wise Multi Skilled Health Worker Curriculum

TOTAL DURATION OF COURSE: 3 Years

- ✓ After completion of Year - 1 Diploma is awarded.
- ✓ After completion of Year - 2 Advance Diploma is awarded.
- ✓ After completion of Year - 3 B. VOC Degree is awarded

Program Outcomes:

- Perform routine clinical laboratory procedures within acceptable quality control parameters in Hematology, Chemistry, Immunohematology, and Microbiology under the general supervision of a Clinical Laboratory Scientist or Pathologist.
- Demonstrate technical skills, social behavior, and professional awareness incumbent upon a laboratory technician.
- Apply systematized problem solving techniques to identify and correct procedural errors, identify instrument malfunctions and seek proper supervisory assistance, and verify the accuracy of laboratory results obtained.
- Operate and maintain laboratory equipment, utilizing appropriate quality control and safety procedures.
- Recognize and participate in activities which will provide current knowledge and upgrading of skills in laboratory medicine.
- By the end of the course the student is able to perform Holistic care of the individuals, families and community in both institutional settings and also community health organizations independently.
- Participate in local, state and National Health programmes and campaigns.
- The student will be able to participate as members of Health team in preventive & promotive Health services.
- Render First Aid & Referral services
- Identifies common Ailments and provide treatment.
- Provide maternal and child health care in institutions and in rural set up.
- Provide referral services for diagnosis treatment and rehabilitation.
- Participate in the prevention and control measures of Nutritional and communicable problems.
- Participate in Family Welfare Programme.

Course Relevance:

The medical sector in India is going through a boom phase. B. Voc in Medical Lab Technology is being one of such important course under the medical sector. With the growing complexity of the course, the scope of this course had expanded over the years. Medical lab technology in India has a whole variety of fields. The medical treatment starts only after the diagnosis of the disease and diagnose, doctors need various kinds of analysis through tests. On the basis of the outcome of these tests, they treat and give advice for prevention. This is where the crucial role of Medical Laboratory Technology comes in picture. Medical lab technicians can find employment in hospitals, medical pathology labs, research labs, urologist office, private laboratory, blood donor centers, Healthcare center or clinics and pharmaceuticals. One can also work as a freelancer as well as a Phlebotomist and have great earnings. Medical lab technicians can also find jobs in research facilities, crime laboratories, universities, pharmaceutical companies and military.

SKILLS

- Brings Health awareness among individuals, families and community.
- Develop skills in providing holistic care to the sick peoples.
- Develop basic skills in immunization
- Develop skills in communication to provide health education services
- Participate in prevention & control of communicable disease cares.
- Provide first and emergency and disaster care
- Develop skills organize and conduct various clinics at different healthcentres.
- Able to motivate eligible couples to adopt family planning methods.

**B.Voc in Multi Skilled Health
Worker
1st Year (Semester-1)**

Category	Paper code	Type of course (Th./Pr.)	Paper name	Marks distribution					
				Theory	Practical	Internal/Assignment	Attendance	Credits	Total marks
Skill Paper	MSHW 101	Th. + Pr.	Concept of health and disease.	40	20	10	5	6	75
	MSHW 102	Th. + Pr.	Basic biochemistry and biophysics	40	20	10	5	6	75
	MSHW 103	Th. + Pr.	Human Anatomy	40	20	10	5	6	75
General Paper	MSHW 104	Th. + Pr.	Computer Skill	20	20	5	5	4	50
	MSHW 105	Th. + Pr.	Human Physiology	40	20	10	5	6	75
Communication Skill	MSHW 106	Th. + Pr.	Communication English	20	20	5	5	2	50
Total marks									400

B.Voc in Multi Skilled Health Worker 1st Year (Semester-2)

Category	Paper code	Type of course (Th./P)	Paper name	Marks distribution					
				Credits	Theory	Practical	Internal/Assignment	Attendance	Total marks
Skill Paper	MSH W201	Th. + Pr.	Principles of epidemiology and epidemiological methods.	6	40	20	10	5	75
	MSH W202	Th. + Pr.	Basic instrumentation and application	6	40	20	10	5	75
	MSH W203	Th. + Pr.	Immuno-haematology	6	40	20	10	5	75
General Paper	MSHW 204	Th. + Pr.	Environment and Health	4	20	20	5	5	50
	MSHW 205	Th. + Pr.	Human Nutrition	6	40	20	10	5	75
Communication Skill	MSH W206	Th. + Pr.	IEC	2	20	20	5	5	50
Total marks								30	400

IEC: Information, education, and communication.

B.Voc in Multi Skilled Health Worker 2nd Year (Semester-3)

Category	Paper code	Paper name	Type of course (Th./Pr.)	Credit	Marks distribution				
					Theory	Practical	Internal	Attendance	Total marks
Skill paper	MSHW 301	Medical Microbiology and Immunology	Th. + Pr.	6	40	20	10	5	75
	MSHW 302	Clinical Pathology & Serology	Th. + Pr.	6	40	20	10	5	75
	MSHW 303	Cytotechnology & Histotechnology	Th. + Pr.	6	40	20	10	5	75
General paper	MSHW 304	First aid and emergency care and Mental health	Th. + Pr.	4	20	20	5	5	50
	MSHW 305	Human Physiology-II	Th. + Pr.	6	40	20	10	5	75
DSE-1	MSHW 306	Project on Diagnostic / Pathological Centre	Pr.	2	0	50	0	0	50
Total marks									400

DSE- Discipline Specific Elective.

**B.Voc in Multi Skilled Health Worker
2nd Year (Semester-4)**

Category	Paper code	Paper name	Type of course (Th. /Pr.)	Credit	Marks distribution				
					Theory	Practical	Internal	Attendance	Total marks
Skill paper	MSHW 401	Research Methodology	Th. + Pr.	6	40	20	10	5	75
	MSHW 402	Medical Statistics	Th. + Pr.	6	40	20	10	5	75
	MSHW 403	Health Centre Management	Th. + Pr.	6	40	20	10	5	75
General paper	MSHW 404	Drug Management	Th. + Pr.	4	20	20	5	5	50
	MSHW 405	Medical Nutrition Therapy	Th. + Pr.	6	40	20	10	5	75
DSE-2	MSHW 406	Project on Primary Health Care Centre	Pr.	2	0	50	0	0	50
Total marks									400

DSE- Discipline Specific Elective

B.Voc in Multi Skilled Health Worker
3rd Year (Semester-5)

Component	Paper code	Paper name	Credit	Marks distribution				Total marks
				Theory	Practical	Internal	Attendance	
Skill paper	MSHW501	Primary Health Care	6	40	20	10	5	75
	MSHW502	Role of MSHW on Health Problems-Diseases	6	40	20	10	5	75
	MSHW503	Role of MSHW as MIDWIFERY	6	40	20	10	5	75
General paper	MSHW504	Drug Management	6	40	20	10	5	75
	MSHW505	Hospital Information System, Front Desk Coordinator and Medical Record System	4	20	20	5	5	50
DSE-3	MSHW506	Visit a Multispecialty hospital/Nursing Home and Preparation of Project	2	-	50	-	-	50
Total marks								400

DSE- Discipline Specific Elective

B.Voc in Multi Skilled Health Worker
3rd Year (Semester-6)

Component	Paper code	Paper name	Credit	Marks
Students Industrial Attachment	MSHW 600P	Internship	30	500
Students will complete 6 months Internship in the Industry Partner Health Point Hospital, Kolkata.				

First Semester Detailed Syllabus

Skill Paper

Skill Paper: Concept of health and disease

Credits: 6 [Theory-4 credits/60 hrs & Practical-2 credits/60 hrs.]

MSHW101T: Concept of health and disease (Theory):

(Credit-4)

Biomedical, ecological, psychological and holistic concept of health. Definition of health by WHO. Dimensions of health. Positive health and concept of well-being. Physical quality of life index (PQLI). Human development index (HDI). Determinants of health. Right and responsibility of health. Indicators of health. Health care, health policy and health system. Concept of disease with natural history and control and prevention. Changing pattern of disease. Communicable diseases and non-communicable diseases.

MSHW101P : Concept of health and disease (Practical)

(Credit-2)

A report preparation on community health and diseases.

Skill Paper: Basic biochemistry and biophysics

Credits:6

[Theory-4 credits/60 hrs & Practical-2 credits/60 hrs.]

MSHW102T: Basic biochemistry and biophysics (Theory):

(Credit-4)

1. **Carbohydrates Chemistry:** Classification, isomerism of monosaccharide. Properties of monosaccharide, Structure and functions of modified monosaccharides, disaccharides, oligosaccharides, polysaccharides & mucopolysaccharides.
2. **Lipid Chemistry:** Classification of fatty acids (straight chain fatty acid, Substituted fatty acids, cyclic fatty acids). Isomerism of fatty acids. Properties of fatty acids, Glycerol. Characterization of fats, phospholipids, micelle, bilayer, liposome, glycolipids, steroids and sterols.
3. **Protein Chemistry:** Classification of amino acids and their functions. Isomerism and properties of amino acids. Properties of protein. Structure of proteins (Primary, Higher orders, Bonds

stabilizing higher structures, secondary (alpha helix, beta pleated sheet, beta bend and omega loop and Triple helix supercoil, and tertiary supersecondary motifs with domain). Nucleotides and their bases, deoxyribonucleic acid, ribonucleic acid, genetic codes.

4. **Biophysics:** Diffusion, absorption, osmosis, viscosity, surface tension, colloids–physiochemical properties and their biological importance. Principles and uses of colorimetry, chromatography, photometry and electrophoresis. Biological importance of acid, base, buffer, pH and acid-base balance. Definition, classification, specificity of enzymes, enzyme kinetics including factors affecting enzyme activity, enzyme inhibition, and coenzyme in metabolism, isoenzyme.

MSHW102P: Basic biochemistry and biophysics (Practical)

(Credit-2)

1. **Determination of pH:** in acids, alkalis and buffers using pH meter and indicators.
Colorimeters: Use of colorimeter in UV and visual range, (principle to be explained and demonstrated with one example for each).
2. **Separation techniques:** Chromatography-
Thin layer Chromatography. (**Amino acids or Fatty acids-** One example for each may be demonstrated from extraction of any food item).
3. **Enzyme Assays:** Serum Alkaline phosphatase (ALP), Serum Glutamate Oxaloacetate Transaminase (SGOT), Serum Glutamate Pyruvate Transaminase (SGPT).

Skill Paper: Human Anatomy

Credits:6

[Theory-4 credits/60 hrs & Practical-2 credits/60 hrs.]

MSHW103T: Human Anatomy (Theory)

(Credit-4)

Parts of blood vascular system. Anatomy of upper and lower respiratory tract. Anatomy of Gastrointestinal tract, urogenital system. Endocrine system including reproductive organs. Integumentary system, CNS & PNS of human body and surface anatomy. Basic idea about the Fascia and muscles of head, neck face, trunk, upper limb and lower limb, muscles of eye. General structure of all bones of skeleton and their attachment, Classification of joints, joint of head, neck, trunk, upper limb,

shoulder girdle and pelvic girdle.

MSHW103P: Human Anatomy (Practical)

(Credit-2)

1. Identification of surface land marks of a human body.
2. Study on muscles of trunk, lower and upper extremities and face on a dissected human body. Study on bone on human body with special reference to the origin and insertion of muscles and ligaments.
3. Study on gross anatomy of respiratory, digestive, endocrine, urinary and genital system on a dissected human body.
4. Study on the anatomy of CNS and PNS on a dissected human body.

General Paper

General Paper : Computer Skill

[Credit: 4 Theory-2 Credit & Practical-2 Credit]

MSHW104T: Computer Skill (Theory) (Credit-2)

1. **Computer fundamental** – Basic anatomy of computer, generation of computer, application of computer.
2. **Hardware and Software concept** – Storage devices, system software, multi programming operating system, multi tasking operating system.
3. **Computer viruses** - Computer viruses, working of viruses, network viruses, antivirus, common antivirus software.
4. **Data Processing** – Types of data, types of data processing, step in data processing, application of data processing. Principle of Programming.

MSHW104P: Computer Skill (Practical) (Credit-2)

1. Tabular form of data presentation in computer.
2. Use of Microsoft Word and Excel with specific problem.

General Paper : Human Physiology

MSHW105: Human Physiology Credits: 6

[Theory-4 Credits & Practical-2 Credits]

MSHW105T: Human Physiology (Theory)

(Credit-4)

- 1. Cell and tissue introduction:** Basic concept of cell structure, structure of cellular contents and transport across membranes, Different type of tissues, distribution and function.
- 2. Cardiovascular system:** Cardiac cycle, cardiac output, blood pressure, heart rate and their regulation. Coronary circulation, renal circulation, hepatic circulation, cerebral circulation. Erythropoiesis, stem cell concept in bone marrow, haemoglobin and their functions, blood coagulation, blood groups, regulation of blood PH.
- 3. Respiration:** Mechanism of inspiration, expiration, gaseous transport through blood, breathing rate regulation, hypoxia, asphyxia, dyspnoea and oxygen therapy.
- 4. Endocrine system:** Different hormones in endocrine system. Action of pituitary, thyroid, parathyroid, adrenal and gonadal hormones.
- 5. Digestive system:** Digestion of carbohydrate, protein, fat, egg, milk and absorption of different food stuffs. Absorption of water. Movement of small intestinal tract and their role.
- 6. Skin and body temperature:** Structure of the skin, function of the skin. Body temperature regulatory process in human - role of endocrine and nervous system.

MSHW105P: Human Physiology (Practical)

(Credit-2)

Staining of Squamous epithelium. Measurement of Heart rate and Blood pressure, PFI (Harvard Step Test) in different posture. Blood group determination. Identification of blood cells and TC, DC. Separation of acellular and cellular components. Study on Superficial and Deep reflexes. Haemoglobin estimation by Sahli's or Drabkin's method. ESR by Westergren method. Muscle striation study by Methelene blue. Study of nodes of Ranvier by Silver chloride method. To demonstrate microscopic structure of Tongue, Oesophagus, Stomach, Small intestine, Duodenum, jejunum, Ileum, parotid gland, large intestine, Pancreas, Liver, Lungs, Skin, kidney, Spleen, Lymph gland, Thyroid gland, Uterus, Testis, Ovary, Spinal cord, Cerebrum, Cerebellum, with permanent slides.

Communication Skill

Credit:2

MSHW106T: Communication Skill (Theory:20)

Credits-2

1. Reading: Techniques of reading, Identifying the context & the central idea.
2. Writing: Rewriting a story from a point of view of different characters with given statements, Technical report writing, resume writing, An application writing for employment etc.
3. Basic Grammar: Vocabulary- distinction words having related meaning, Descriptive approaches, use of antonym. Grammar in spoken & written. Making statements.
4. Practice: Exercise on the use of different grammatical constructions in context. Identification of the use of above given grammatical devices from different text like newspaper, poems, stories etc. Dialogues, Public speech, Telephonic conversation, Project on TV programme & newspaper.

MSHW106P: Communication Skill (Practical: 20)

1. Presentation on a given topic.
2. Viva.

Second Semester Detailed Syllabus

Skilled Paper

Skill Paper: Principles of epidemiology and epidemiological methods.

Credits: 6

[Theory-4 credits/60 hrs & Practical-2 credits/60 hrs.]

MSHW201T: Principles of epidemiology and epidemiological methods. (Theory)

(Credit-4)

Epidemiology-definition, aims, approach, measurements, mortality rates and ratio. Epidemiologic methods-descriptive, analytical, case-control, cohort, RCT. Infectious disease epidemiology-infection, contamination, infestation, host, contagious disease, communicable disease, epidemic, endemic, sporadic, pandemic, exotic, zoonoses, epizootic, enzootic, nosocomial infection, opportunistic infection, itrogenic disease, eradication. Dynamics of disease transmission, modes of transmission, susceptible host-defences, herd immunity.

MSHW201P: Principles of epidemiology and epidemiological methods (Practical):

(Credit-2)

A report preparation on epidemiological survey from a health sector.

Skill Paper: MSHW202: Basic instrumentation and application

Credits:6

[Theory-4 credits/60 hrs & Practical-2 credits/60 hrs.]

MSHW202T: Basic instrumentation and application (Theory):

(Credit-4)

Basic laboratory principles, safety measure rules and regulation of BSL and biosafety cabinets. Code of conduct of medical laboratory personnel. Organization of clinical laboratory and role of medical laboratory technician. Medical laboratory professional - professionalism in laboratory workers, Code of conduct, communication between physician and lab technician. Common Lab accidents and ways for its prevention, First aid in the clinical laboratory, Common Laboratory hazards, Waste disposal in the labs Introduction to basic pathology of body fluids. Working

Principle, components and application of microscope, spectrophotometer, colorimeter, centrifuges, autoclave, laminar flow, incubator, blood cell counter, ELISA, semi and full autoanalyzer, HPLC, Electrophoresis, RT-PCR, FACS.

MSHW202P: Basic instrumentation and application (Practical): (Credit-2)

Preparation of SOP for microscope, spectrophotometer, colorimeter, centrifuges, autoclave, laminar flow, incubator, blood cell counter, ELISA, semi and full autoanalyzer, HPLC, Electrophoresis, RT-PCR, FACS using any one parameter.

Skill Paper: Haematology Credits:6

[Theory-4 credits/60 hrs & Practical-2 credits/60 hrs.]

MSHW203T: Haematology (Theory): (Credit-4)

Basic requirements of haematology laboratory, cleaning of laboratory glassware in Haematology, Sterilization process. Genetics in blood banking, Blood collection & preservation including cryopreservation, Coombs tests-significance. Haemoglobin, its synthesis and types, normal and abnormal haemoglobins, extravascular and intravascular haemolysis. Haemolytic anaemia, pathogenesis and laboratory investigations, principle and procedure of special test. Haemolytic disease of new born, Haemostasis, Idea about Thalassaemia and sickle cell anaemia. Blood donor selection, screening, Transfusion transmitted diseases & their lab diagnosis. Blood Components, Preparation, Indications, Storage, difficulties and autologous transfusions. HLA- theory importance in transplantation, disease associations & basic techniques used in tissue typing. Automation in Haematology Laboratory.

MSHW203P: Haematology (Practical): (Credit-2)

1. Specimens, Blood collection & preservation using different anticoagulants & preservative solutions.
2. Experiments on TC & DC, PCV, MCV, MCH, MCHC and ESR. (Wintrob method) Determination of haemoglobin by haemoglobin meter and by colorimetric method. Determination of Bleeding time and clotting time, PT
3. Screening test for sickle cell anemia and slide identification of Thalassaemia. Test Compatibility testing- cross matches.
4. Investigation of transfusion reactions of haemolytic disease of new born HBsAg & HIV Antibody testing in blood bank, auditing in blood banks how to store blood.

General Paper: Environment and health

Credit:4

[Theory-2 Credits & Practical 2 Credits]

MSHW204T: Environment and health (Theory):

1. Ecosystems: What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

2. Natural Resources: Renewable and Non-renewable Resources. Land resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Joint forest management. Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter---state). Energy resources: Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

3. Environmental Pollution: Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution. Nuclear hazards and human health risks. Solid waste management: Control measures of urban and industrial waste. Pollution case studies. Noise pollution.

4. Environmental Policies & Practices: Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD). Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context. Environmental policy and gender issues.

5. Human Communities and the Environment: Human population growth: Impacts on environment, human health and welfare. Resettlement and rehabilitation of project affected persons; case studies. Disaster management: floods, earthquake, cyclones and landslides. Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan. Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness, case studies.

MSHW204P: Environment and health (Practical):

Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc. Visit to a local polluted site---Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds and basic principles of identification. Study of simple ecosystems---pond, river, Delhi Ridge, etc. Disaster management. Coastal ecosystem.

General Paper: Human Nutrition

Credits: 6

[Theory-4 Credits & Practical-2 Credits]

MSHW205T: Human Nutrition Credits (Theory):

1. **Nutrition during infancy:** Breast feeding, Formula feeding, Weaning, Supplementary foods, Nutritional management of Preterm baby.
2. **Nutrition for children:** Diet in early childhood, elementary school age, high school age.
3. **Nutrition during pregnancy and lactation:** Nutritional demands of Pregnancy, Food selection during Pregnancy, Complications of pregnancy and dietary management, Diet during Lactation.
4. **Nutrition to athletes:** Nutritional requirements and dietary management in sports man and athletes, Meal planning for athletes.
5. **Geriatric nutrition:** Planning of meals for older people, Nutrition of aged persons, Physiological complications in geriatric group and dietary modifications required, Oxidative stress and aging and role of antioxidative nutrients for preventing aging.

MSHW205P: Human Nutrition Credits (Practical):

1. Preparation of normal diet chart for infant (6-12 months). Preparation of normal diet chart for preschool children.
2. Preparation of normal diet chart for college student.
3. Preparation of normal diet chart for pregnant mother and lactating mother.

Note: In laboratory note book, calculation of nutritive value should be recorded according to portion size of specific diet for particular individual.

Communication Skill

MSHW206: Information, education and communication Credit:2

Theory-2 Credits

MSHW206T: Information, education and communication (Theory):

1. Basics of communication- nature, characteristics, functions, process, models, elements, principles, barriers, perception, persuasion and empathy, types of communication, levels (settings) of communication transactions, process of listening. Communication systems and communication theories- human interaction theories, mass communication theories, message design theories, communication systems, culture and communication.
2. Objective of communication, Elements of communication, Basic principle of communication, Information centered methods, Health group communication method, Behaviour-centred method – their advantages, Barrier of communication. Concept of Mass Communication method, Mass Communication. Media – their advantages and limitation. Impact of Education on Knowledge, Attitude and Practice development in the field of Health.

MSHW206P: Information, education and communication (Practical):

Assignment program on Information Education and Communication (IEC) in a community.

Third Semester Detailed Syllabus

Skilled Paper

[Theory-4 credits/60 hrs & Practical-2credits/60 hrs.]

MSHW301T: Medical Microbiology and Immunology (Theory; Credit-4):

1. Bacteriology: Morphology and Structure of bacteria- organization of cell wall, cell membrane, flagella and capsules in bacteria, Morphogenesis in bacteria, formation of spores and cysts. Bacterial growth- Extrinsic and intrinsic factors affecting growth. Binary fission of bacterial growth, Bacterial growth curve, Types of culture media, Methods of isolation. Bacteriophages: Morphology, multiplication, detection and enumeration. Physical and chemical methods used in sterilization and disinfection, importance of sterilization and disinfection.

2. Virology: Influenza, Measles, Rabies, Kalazar, Swain-flu and SARS covid 2. Concept of viroids and prions.

3. Medical Entomology and Parasitology: Basic concept of Medical Entomology and Parasitology. Arthropods of medical importance. Arthropods borne disease and their transmission. Principle of arthropod control. Mosquito– role of this arthropod in disease transmission, Diseases types, Controlling measures. Houseflies – Role of disease transmission and controlling measures. Flea – role of disease transmission and controlling measure & itch mite. Filaria – causes, symptoms and controlling measures. Taeniasis – causes, symptoms and controlling measures.

4. Algae & Fungi: Morphology, fine structure and role in disease of fungi, actinomycete and algae.

5. Clinical Immunology: Basic concept of Immune system. Types of immunity, cellular, humoral, active, passive, natural, and acquired immunity. Primary immune organs. Antibody formation and antigen-antibody reaction, type of reaction. Immunoglobins—type, structure and their specific importance. Role of complements in human immunity. Basic concept of immunization. Primary and secondary response of immunization. Vaccination and Booster dose. Immunodeficiency diseases. Immunosuppression - role of organ transplantation. Auto immune disease: Type –I Diabetes Mellitus Hashimoto disease, Myasthenia Gravis, Rheumatoid Arthritis and Systemic Lupus Erythromatosus (SLE).

MSHW301P: Medical Microbiology and Immunology (Practical; Credit-2):

1. Sterilization techniques and cleaning of glassware.
2. Preparation of culture media, biochemical test for bacterial differentiation.
3. Examination of skin scapper fungi and Acid fast bacilli and examination of sputum for Acid fast bacilli detection.
4. Biochemical tests for bacterial differentiation.
5. Gram staining: Gram positive and Gram negative bacteria staining.
6. Collection, Presentation & Identification of different diseases caused by Arthropods (Housefly, Mosquito etc.)
7. Whole mount preparation of slide for diagnosis of different diseases causing arthropods for their detailed anatomical studies.
8. Identification of different disease caused by Helminth and Protozoan parasites.
9. Identification of different phases of life cycle of arthropods protozoa, helminth, having medical importance for causing disease.
10. Slide identification of microfilaria, *Taenia solium*, Ascaris, and deferent stages of malarial patients.
11. Examination of stool for OPV (Ova Parasite Cyst).
12. Determination of 'ABO' blood grouping and 'Rh' typing. Antigen-Antibody reaction testing by precipitating ring. Ouchterlony test.
13. Quantitative assay of Immunoglobins in plasma. (IgG, IgM).

MSHW302T: Clinical Pathology & Serology (Theory; Credit-4):

1. **Urine:** Collection of urine specimen, types of urine specimen and preservation of urine. Routine examination of urine – Physical and Microscopic examination. Chemical test of urine for glucose, protein, Ketone bodies, bilirubin, urobilinogen & blood.
2. **Stool:** Collection of stool specimen, types of stool specimen and preservation of stool. Microscopic examination of stool. Routine test for stool and occult blood test. Collection and preparation of specimen used in serological laboratory.
3. **Sero-diagnostic tests:** Principle of sero-diagnostic tests, precipitation, flocculation, agglutination, neutralization and coagulation. Serological test for syphilis (STS) and VDRL, CRP, RPR test. WIDAL test for Salmonella typhi. Immunological test for pregnancy (direct and indirect). Intradermal hypersensitivity test – Montoux test. ASO test.
4. **Clinical biochemistry:** Determination of glucose, urea, creatinine, uric acid, bilirubin, Triglyceride, cholesterol and Phospholipids, LDL, VLDL, HDL in plasma / blood.
5. **Liver function tests:** Total protein, Albumin, Globulin ratio, ALP, ALT, AST, Conjugated and Unconjugated bilirubin.

6. **Gastric function tests:** Free acidity, Total acidity, total acidity, gastric pH, gastric enzyme analysis.

7. **Clinical reproductive physiology:** Sperm count, sperm motility, sperm morphology, fructose estimation of semen. Sperm viability test. Primary idea on Assisted Reproductive Technology (ART). Acid phosphatase in semen.

MSHW302P: Clinical Pathology & Serology (Practical; Credit-2):

1. Physical and Microscopic examination of urine.
2. Bio-chemical estimation of glucose in urine.
3. Bio-chemical estimation of protein and ketone bodies in urine, bile salt, bile pigment, urobilinogen and blood in urine.
4. Laboratory testing of CSF, Serous fluid, Gastric juice, and Synovial fluid.
5. Collection and processing of CSF and its laboratory investigation.
6. Routine test and microscopical test for stool and occult blood test. Study of precipitation, agglutination and coagulation test.
7. VDRL test, WIDAL test, RPR, ASO test.
8. CRP test, RA test, AIDS test, STS test.
9. Immunological test for pregnancy.(direct and indirect)
10. Montoux test.
11. Preparations of plasma, serum, and protein free filtrate from blood for biochemical analysis.
12. Determination of blood glucose, total protein in serum, blood urea, blood creatinine, serum uric acid, serum TG, blood cholesterol and blood Phospholipids and Ketone bodies.
13. Experiment on glucose tolerance test.
14. Hormone assay by ELISA reader – Estrogen, Testosterone, T3 and T4, LH, FSH, PRL, Insulin, Glucagon, Glucocorticoids, GH.
15. Sperm count, sperm motility, sperm morphology, fructose assay in semen, Acid Phosphatase in semen. Sperm viability test.

MSHW303T: Cytotechnology & Histotechnology (Theory; Credit-4):

1. Equipments used in Cytotechnology and Histotechnology.
2. Specimen preparation in Cytotechnology and Histotechnology –fixation, dehydration, clearing, embedding, section cutting, mounting staining. Stain preparation. Haematoxylin, eosin, trichrome stain, PAS stain.

3. Techniques followed in routine Haematoxylin – Eosin staining, Trichrome staining, PAS staining, Geimsa staining.

4. Idea about frozen section techniques and automation of histotechnology laboratory.

MSHW303P: Cytotechnology & Histotechnology (Practical; Credit-2)

1. Tissue collection and fixation.

2. Dehydration of collected tissue sample in the graded alcohol.

3. Stain preparation – Haematoxylin, eosin, PAS, Trichrome, iron haematoxylin.

4. Staining techniques using above stains.

5. Preparation of specimen for cytological evaluation by papaniculus staining, crystal violet staining.

6. Characterization of benign and malignant cells.

General Paper

General Paper: First aid and emergency care (Credit-4; Theory-2 and Practical-2)

MSHW304T: First aid and emergency care and Mental health (Theory; Credit-2):

1. **Importance and principles of first aids:** Definition, aim and importance of first aid. Rules or general principles of first aid.

2. **Life saving measures:** Management of emergency situation, general rules for first aid, observations, examinations, tests of body temperature, rapid pulse, breathing, blood pressure, weight and height ,case study of physical examination.

3. **Dressing and bandages:** First aid in the injuries of the skin (wounds, burns and scalds, bites and stings), first aid in injuries to bones, joint and muscles (fracture), transport of casualties, first aid in loss of consciousness, first aid in convulsions and hysteria, first aid in shock, first aid for foreign bodies in the ear, eye, nose and throat, artificial breathing, first aid in asphyxia, first aid in poison.

4. **Mental Health:** Introduction to psychology, mental hygiene and health, self understanding and growth. Mental illness: normal and abnormal behavior.

MSHW304P: First aid and emergency care and Mental health (Practical; Credit-2)

1. Preparation of first aid kit.

2. Dressing, bandaging and splinting (spiral, reverse spiral figure of 8 spica, shoulder, hip, ankle, thumb, finger, stump, single and double eye, single and double ear, breast, jaw, capelin), triangle bandage uses, abdominal binder and bandage, breast binder, T and many tail bandage, knots reef, clove.
3. Transportation of the injured.
4. CPR: Mouth to mouth, Sylvester Schafer, External cardiac massage.

General Paper: Human Physiology-II

(Credit-6; Theory-4 and Practical-2)

MSHW305T: Human Physiology-2 (Theory; Credit-4):

1. Nerve muscle physiology: Neurone: Structure, degeneration, regeneration, denervation hypersensitivity, electro genesis of action potential. Neuro muscular transmission and its clinical application. Functional anatomy of skeletal muscle. Mechanism of muscle contraction and relaxation, contracture, rigor mortice, isotonic & isometric contraction, energy sources and metabolism, motor unit, size principle, recruitment. Types of smooth muscles and mechanism of contraction.

2.Reproductive system: Sex differentiation and development of Reproductive system. Aberrant sexual differentiation, chromosomal abnormalities, developmental abnormalities. Puberty, precocious and delayed puberty. Male reproductive system: Spermatogenesis, endocrine functions of testis, abnormalities of testicular function, cryptorchidism, male hypogonadism, sterility. Female reproductive system: ovary, oogenesis, ovulation, corpus luteum, ovarian hormones – oestrogen, progesterone, relaxin, control of ovarian functions by hypothalamic and pituitary hormones. Menstrual cycle: ovarian cycle, uterine cycle, hormonal basis, abnormalities of menstruation, infertility. Pregnancy: Fertilization, implantation, placental hormones, pregnancy tests, parturition. Lactation. Contraception.

3.Excretory System: Functional anatomy of kidney, nephron-structure, parts, function, types. Juxtaglomerular apparatus: autoregulation, peculiarities, measurement. Glomerular filtration: filtration barrier, forces governing filtration, measurement. Tubular functions: reabsorption, secretion, Tm values. Regulation of ECF – volume, osmolality and electrolytes. Acid base balance (to be taught in biochemistry). Micturition. Renal function tests, renal clearance, abnormal constituents of urine. Renal failure symptoms.

4.Nervous system: Organisation of nervous system, functional anatomy of brain and spinal cord, neuron, neuroglia. Cerebral circular, CSF, blood-brain barrier. Synapse – types, properties, synaptic transmission, neurotransmitters. Sensory receptors: classification, generator potential, properties. Reflex action: definition, reflex arc, stretch reflex, inverse stretch reflex, withdrawal reflex

5.Sensory system: Touch, pain, temperature, vibration, proprioception, ascending tracts, sensory cortex.

Pain: types, visceral pain, pain inhibiting mechanism, gating of pain, opioids, analgesia, hyperalgesia, thalamic syndrome. Motor system: motor cortex, descending tracts – pyramidal & extrapyramidal tracts, upper motor neurone lesion, lower motor neurone lesion, hemiplegia, paraplegia, monoplegia. Injuries of spinal cord: complete transaction, hemisection. Tabis dorsalis, syringomyelia, section of anterior root & posterior root. Cerebellum: structure, parts, connections, functions, features of cerebellar lesion. Basal ganglia: components, connections, functions, applied. Muscle tone, posture, equilibrium, regulation of muscle tone & posture, vestibular apparatus. Autonomic nervous system: organization and functions. Hypothalamus: structure & functions, temperature regulation. Physiology of thalamus, reticular formation, RAS. EEG, sleep and wakefulness. Physiology of limbic system. Higher functions of the brain: learning & memory, speech.

6. **Special Sense:** Smell: receptor, pathway. Taste: taste buds, pathway. Vision: structure of eyeball, structure of retina, visual pathway and effects of lesion, image forming mechanism, light reflex, accommodation, errors of refraction, electrophysiology of eye, colour vision, colour blindness, dark adaptation. Hearing: functional anatomy of the ear, functions of middle ear, organ of corti, hair cell physiology-endocochlear potential, auditory pathway, sound localization, pitch discrimination, deafness.

MSHW305P: Human Physiology-2 (Practical; Credit-2):

1. Clinical examination of CVS: Arterial pulse, apex beat, heart sounds, recording of blood pressure and effects of posture and exercise on BP.
2. Clinical examination of nervous system: Examination of cranial nerves. Examination of sensory system.
3. Examination of motor system- examination of superficial and deep reflexes, examination of muscle tone and power.
4. Demonstration of ECG, EEG, EMG, ophthalmoscope, bicycle ergometer and arterial blood gas analysis.
5. Pregnancy Test.
6. Colour blind test.
7. Visual acuity test.
8. Audiometric test

DSE- Discipline Specific Elective (Credits-2)

MSHW306P: Project on Diagnostic / Pathological Centre.

Fourth Semester Detailed Syllabus

Skilled Paper:

Credits:6

[Theory-4credits/60hrs& Practical-2 credits/60hrs.]

MSHW401T: Research Methodology (Theory)

(Credit-4)

1. Fundamentals of research

Meaning and objective of research, types of research (basic, applied and patent oriented), defining research problem, research process and steps involved in research process, research proposal or synopsis.

2. Literature survey and documentation

Methods of literature survey, use of library, books, journals, e-journals, thesis, chemical abstracts and patent database, importance of documentation, documentation techniques, use of computer programs/packages (online resources such as scientific search engines and online servers) in literature survey and documentation.

3. Data collection, analysis and hypothesis

Classification of data, methods of data collection, sample size, sampling procedure and methods. Data processing and graphical representation of data. Hypothesis: Types of hypothesis (experimental and nonexperimental). Hypothesis testing (parametric and nonparametric tests), types of errors and their control.

4. Research ethics, plagiarism and impact of research

Research ethics, responsibility and accountability of the researchers, Plagiarism.

5. Technical writing and reporting of research

Types of research report: Dissertation and thesis, research paper, review article, short communication, conference presentation, meeting report etc. Structure and organization of research reports: Title, abstract, key words, introduction, methodology, results, discussion, conclusion, acknowledgement, references, footnotes, tables and illustrations. Use of reference managing software (such as MENDELEY, ENDNOTE). Impact factor, rating, indexing and citation of journals.

MSHW401P: Research Methodology (Theory)**(Credit-2)**

Formulate a research design with a strong hypothesis and mention the gap in the chosen research area and prepare a report as per a standard SJR, SCI or Elsevier journal (Preparation of Manuscript), a report preparation on Review and Literature with the help of research publications and power point presentations.

Skilled Paper: Medical Statistics**Credits:6****[Theory-4credits/60hrs& Practical-2 credits/60hrs.]****MSHW402T: Medical Statistics****(Theory)****(Credit-4)**

1. Conceptual understanding of statistical measures, Classification and tabulation.
2. Measurement of central tendency, Frequency distribution, Histogram, Frequency polygon, Binomial distribution, Normal distribution, Parametric and nonparametric tests.
3. Sampling Statistics: Mean, median, mode, standard deviations, standard errors, sampling distributions, degrees of freedom, probability distribution: normal, binomial, and Poisson distributions.
4. Testing of hypothesis, Chi-square test, Goodness of fit, student 't' test, Correlation, Regression and prediction ANOVA, posthoc analysis.
5. E. Correlation - product moment correlation, partial correlation, multiple correlations, Regression - simple and multiple linear regressions.

MSHW402P: Medical Statistics**(Practical)****(Credit-2)**

1. Computation and significance of partial correlation coefficient between two variables. 2. Computation and significance of multiple correlation coefficient between a continuous measurement variable and two others continuous measurement variables.
3. Computation and significance of point biserial r between a continuous measurement variable and a genuinely dichotomous qualitative variable.
4. Computation and significance of biserial r between a continuous measurement variable and an artificially dichotomized variables.
5. Computation of percentile values from grouped data.
6. Testing the goodness of fit of a continuous frequency distribution with best –fitting normal distribution by Chi square test and G test.

7. Computation and significance of one-way model I analysis of variance and multiple comparison t-test and Scheffe's F test.

MSHW403T: Health Centre Management (Theory)

(Credit-4)

1. Concept of health centre Management

Definition : Principles, Elements, Line of authority.

2. Health centre

SC/PHC/CHC – Organization of functions, facilities, records and reports, Centre activity plans. Conduct of clinics and special programmes, Referral systems, conducting meetings, IEC activities.

3. Health Team

Concept of health team, Importance of Team approach, Staffing pattern in SC/PHC/CHC Roles and responsibilities of each member in the team.

4. Health Administration in India – National/State/Local level,

Health care delivery systems : Public, Private National & International health agencies and NGO organizations, AYUSH, Arogya Sree services Health,

5. Maintenance of stocks :

Maintenance of supplies, drugs, equipment, stock indenting, calculation of indents as per population requirement, Management Information and Evaluation System (MIES), Maintenance of stock records and reports.

6. Population Education and Family Welfare :

Population trends in India – Vital statistics, birth and death rates, growth rate, NRR, fertility rate, couple protection rate, family size – Role of mass media and IEC – Identification of eligible couples and those need contraceptive methods – information related to contraception and importance of choice – Natural and temporary methods of contraception – Permanent methods – New methods nor plant and injectables – Emergency contraception – follow up of contraceptive users – Role of MSHW.

7. Co-ordination :

Inter sectoral co-ordination – Co-ordination with village health guides – School teacher, AWWs – ASHA – NGOs – Other Governmental organizations.

8. Implementation of National Health Programme

National Health Programmes and role of the MSHW.

9. Staff development –

Continuing education for staff development – Methods of staff development – Intervene education programmes, circulars, handouts, journals, meetings.

MSHW403P: Health Centre Management (Practical)**(Credit-2)**

1. Management of SC/PHC/CHC/Area hospital: Management of equipment, Management drugs & Solution, In directing and storage, Management of Iceland refrigerators (LLR) and cold chain system.
2. Organization & conducting various clinics.
3. Maintenance of records & reports and Preparing action plans.
4. Participate & conduct meetings weekly with medical officer, monthly with District medical and health officer, Asha workers meeting.
5. Visits : Observing administration of health at various levels .
6. Visit to FPAI, APSACS, DTCCB – DOT ART Centres & Leprosy rehabilitation Centres.

General Paper**MSHW404T: Drug Management (Theory)****(Credit-2)****1. Types of drugs:**

Different systems of medicine: Allopathy and AYUSH – Classification of drugs – Forms and characteristics of drugs – Abbreviations used in medication – Administration of drugs – policies and regulations, as per protocols and standing orders- classification of drugs.

2. Administration of drugs:

Routes of administration – Oral, parental (intramuscular, intradermal, subcutaneous, intravenous) rectal, local and others Administration of drugs precautions, principles safety measures observation and recording – Role of MPHWF in the administration of drugs.

3. Drugs used in Minor Ailments:

Common drugs for fever, cold and cough, aches and pains, loose motions – Drug kit in the sub centre, content and its use – Storage and care of drugs.

4. Common Emergency Drugs

I.V fluids, antibiotics, injections and magnesium Sulphate, Deriphylline, avil and other anti histamine, vitamin K, anti rabies vaccine, ante snake venoms as per the protocol, precautions for administration.

5. Nutraceuticals and supplemental drugs: The food products used as nutraceuticals can be categorized as dietary fibre, prebiotics, probiotics, polyunsaturated fatty acids, antioxidants and other different types of herbal/ natural foods.

6. Antibiotics and types, mechanism of actions.

MSHW404P: Drug Management (Practical)**(Credit-2)**

A report preparation on drugs used by various people in community as per various ailments from registered health practitioners, self or unskilled persons.

MSHW405T: Medical Nutrition Therapy (Theory)**(Credit-4)**

1. Basic Concepts of diet therapy: Transformation of normal diet to therapeutic diet, classification of therapeutic diets.
2. Team approach to health care: Assessment of patients' needs.
3. Routine Hospital Diets: Regular, light, soft, fluid, parenteral and enteral feeding
4. Inborn error of metabolism – Lactose Intolerance, Galactosamia, Phenylketonuria and its dietary management.
5. Etiology, symptoms, diagnostic tests and dietary management of intestinal diseases: Diarrhea, Steatorrhoea, Diverticular disease, Inflammatory bowel disease, Ulcerative Colitis, Flatulence, Constipation, Irritable Bowel Syndrome, Haemorrhoids.
6. Etiology, symptoms, diagnostic tests and dietary management of Malabsorption syndrome, Celiac sprue, tropical sprue, Intestinal brush border deficiencies (Acquired disaccharide intolerance), Protein losing enteropathy.
7. Disease of the liver, Exocrine Pancreas and Biliary System. Liver function tests, application of diet therapy and nutritional care in liver disease. Dietary care and management in Viral Hepatitis, Cirrhosis of liver, Wilson's diseases. Dietary care and management in diseases of Gall Bladder and Pancreas Cholelithiasis, Cholecystitis, Cholecystectomy, Pancreatitis.
8. Anaemias: Pathogenesis and dietary management - Nutritional Anaemias, Sickle Cell Anaemias, Thalassemia, Anaemia resulting from Acute Haemorrhage.
9. Arthritis and gout: Etiology, symptoms, diagnostic tests and dietary management.
10. Etiology and symptoms of diabetes mellitus, heart diseases, kidney disease and kidney stone.

MSHW405P: Medical Nutrition Therapy (Practical)**(Credit-2)**

1. Planning and preparation of clear fluid/ full fluid diet for diarrhoea patient.
2. Planning and preparation of soft/semi solid diet for Steatorrhoea patient.
3. Planning and preparation of diet for Diverticular disease patient.
4. Planning and preparation of diet for Ulcerative Colitis patient.

5. Planning and preparation of diet for Flatulence patient.
6. Planning and preparation of diet for Constipation patient.
7. Planning and preparation of diet for Irritable Bowel Syndrome patient.
8. Planning and preparation of diet for Haemorrhoids patient.
9. Planning and preparation of diet for Celiac sprue patient.
10. Planning and preparation of diet for Anaemia patient.
11. Planning and preparation of diet for Arthritis and gout patient.

DSE-2

MSHW 406: Project on Primary Health Care Centre (Practical)

Credit:2

A report preparation on project based on primary health care survey and power point presentations.

Fifth semester Detailed Syllabus

Skill Paper

Credits:6[Theory-4credits/60hrs&Practical-2 credits/60hrs.]

MSHW501T:Primary Health Care (Theory)

(Credit-4)

1. The Hospital

Functions – Classification – Admission and discharge procedure of a patient

2. Preparation of patient unit

Optimum environment for patient

- Factors of safety – Furnishing for the patient unit – Bedmaking –different types of bed – closed – opened – occupied – operation – Cardiac– Fracture – amputation

3. Hygiene of the Body :

Personal and individual Hygiene – Care of mouth, Skin, hair and nails –Sexual hygiene – Hygiene and comfort needs of the sick, - Care of pressurepoints, positioning and changing –Care of hair wash – Care of hand andnails, Hand washing – Care of eye wash – Mouth care, Elimination- care ofbowels and bladder

4. Collection of specimen :-

Principles and methods of collection of specimen and handling bodydischarges – Collection of specimen of blood, spectrum, urine, stool – Safedisposal of body discharges.

5. Disinfection and sterilization :

Principles and methods of antiseptis, disinfection and sterilization – Methods of disinfecting different equipment – Methods of sterilizing different equipments.

6. Bio-Medical Waste Management

Waste disposals – infections and non infections concepts, principles and methods at different levels.

MSHW501P:Primary Health Care (Practical)

(Credit-2)

Practice basic health care procedures in outpatient & inpatient departments.

1.Fever :

Vital signs : Temperature, pulse, respiration Blood pressure – Temperature maintenance and the physiology of fever – Fever types, and stages – causes of fever – Common conditions causing fever, malaria, typhoid, Acute respiratory infection (ARI) etc. –Management of patient with fever –Alternate system of medicine.

2.Respiratory Problems :

Common respiratory problems types, classification – cold and cough, ARI tonsillitis, bronchitis, Pneumonia and tuberculosis – causes signs and symptoms treatment of respiratory problems – Management, Role and responsibilities of MSHW in case of patients with respiratory problems including home care remedies.

3.Aches and pains :

Causes and nursing Management of tooth ache ear ache, abdominal pain, head ache, joint pains – Management.

4.Digestive problems :

Indigestion – anorexia – Vomiting, distension and constipation – Haemorrhoids, hernia – ulcers, and intestinal obstruction – Role of MSHW in the community including Home care remedies.

5.Urinary Problems :

Signs and symptoms of renal conditions – Retention of urine, renal colic, edema – Role of MSHW in the community including Home care remedies.

6.Cardio Vascular problems :

Signs and symptoms of cardiac conditions and blood related problems, Heart attack, Chest pain, Anemia – hypertension and leukemia – care of a cardiac patient at home – Role of MSHW in the community including Home care remedies.

7.Diseases of the Nervous system :

Signs and symptoms of neurological problems – head ache, back ache, and paralysis, care of a patient with stroke at home – care of pressure points, back care, changing of positions, active and passive exercise, body support to prevent contractures – Role of MSHW in the community including home care remedies.

8.Metabolic diseases :

Diabetes signs and symptoms – complications diet and medications – Skincare – foot care – urine testing and administration of insulin injections.

9. Care of Handicap :-

Handicap – different types – counselling for prevention of certain handicaps– understanding the handicapped person. Helping family to ensure needbased care.

MSHW502P: Role of MSHW on Health Problems-Diseases (Practical)

(Credit-2)

Give care to sick people at Upgraded PHC/CHC/District hospital/Area Hospital. Assess and take care of Sick patients with different diseases.

MSHW503T:Role of MSHW as MIDWIFERY(Theory)

(Credit-4)

1.Normal pregnancy

Signs and symptoms of pregnancy – Various diagnostic tests forconfirmation of pregnancy – physiological changes during pregnancy –Minor ailments during pregnancy & their management.

2.Antenatal care

Registration – taking history of pregnant women – physical examination,investigation – routine and specific prophylactic medications – Need basedhealth information and guidance – Nutrition in pregnancy – special needs apregnant women – involvement of husband and family – identification ofhigh risks cases and referral preparation of mother for delivery.

3.Normal Labour

Onset and stages of labour, physiological changes, changes in uterinemuscles and cervix – lie, attitude, position, denominator and presentation offoetus – Foetal skull, mechanism of labour- Identification of high risk casesFoetal distress and maternal distress during labour – partograph in themanagement of Normal Labour – Role of MPHWF and referral

4. Care during normal labour

History of labour – Importance of 6 ‘c’ – Monitoring progress of labour with partograph, preparation for delivery – Care of mother in first and second stage of labour preparation for delivery – care of mother in first and secondstage of labour – assist and conduct child birth –

immediate care of newborn resuscitation, apgar score, cord care – Delivery of placenta and examination of placenta – care of mother in third and fourth stage -Recognize degree of tear and appropriate care and referral – Establishment of breast feeding, exclusive breast feeding – Kangaroo mother care – Babyfriendly hospital initiative – Record child birth and ensure birth registration.

5. Normal puerperium

Physiological changes during postnatal period – postnatal assessment – Minor ailments during puerperium and their management – care of mother DIET, REST, EXERCISE, HYGIENE – Management of breast feeding prophylactic medicines – Special needs of postnatal women – Need based health education.

6. High risk New born Preterm/low birth wt babies – special needs of high risk babies – care at home – referral follow up – care during asphyxia, convulsions, Vomiting – case of tetanus, meningitis, sepsis, diarrhea.

7. Abnormalities of pregnancy :

Common abnormalities of pregnancy hyperemesis gravidarum, leaking and bleeding per vagina – Anemia of pregnant women – preeclampsia and eclampsia and toxemia of pregnancy – Indication of premature rupture of membranes, prolonged labour, anything requiring manual practices, UTI, obstetrical shocks, uterine abnormalities, ectopic pregnancy – Disease complicating pregnancy – T.B, diabetes, Hypertension.

8. Abortion :

Types of abortion, causes of abortion – Need for safe abortion – referral – complications of abortions – medical termination of pregnancy – care of women who had abortion. Application of MTP.

9. High risk labour :

Common high risks of labour – Abnormal presentations – Abnormal uterine action – cephalopelvic disproportion (CPD) – Prolonged labour identification immediate management and referral – Emergency care of mother during transfer to hospital – Role of MSHW.

10. Abnormal puerperium

Postpartum Haemorrhage and its management – Retention of urine breast complications during lactation and their management – Psychiatric complications – Role of MSHW.

11. Medications used in Midwifery

Pain relieving drugs – Anesthetic drugs – For uterine contractions – for controlling bleeding – for preventing postnatal infection – for preventing eclampsia – Antibiotics – IV fluids – Role of MPHW(F)

12. Women's Health problems

Complications related to child birth – VVF, RVF, prolapsed and incontinence – cervical erosion and leucorrhoea – purities Cancers, cervical, breast – papsmear for detection of cancer cervix – Tumors – Fibroids – Menstrual disorders, Menopause and its complications – classification and causes of infertility in male and female investigations and treatment – Identification of couples, counseling, referral and follow up.

13. RTIs and STIs

Causes and signs and symptoms of STI and RTIs – Syndromic approach for treatment. Referral treatment and follow up care – Information, education and communication for prevention and treatment. HIV/AIDS – epidemiological facts related to spread of infection methods of transmission, effects of immunity and signs and symptoms the AIDS pt community support and home care – counseling process and techniques – counseling of HIV positive patients and pregnant women – Standard safety measures – voluntary counseling and testing centre – Integrated counselling and testing centre (ICTC) activities – Antiretroviral Therapy (ART) – Prevention of parent to child transmission (PPTCT) – Prophylaxis and breastfeeding guidelines.

MSHW503P: Role of MSHW as MIDWIFERY (Practical) (Credit-4)

1. Midwifery and nursing, care of mothers at risk (Observe pregnant women at hospital and pregnant women at home) Including estimation haemoglobin and IFA treatment – Give TT injection to women – observation and assist deliveries – Monitor and maintain partograph for conduct cases. Follow up of postnatal mother in the hospital. Conduct health education for groups of mothers

2. Conduct antenatal examinations at home – participate in antenatal clinics in sub centre – two, identify high risk mother and refer – follow up of postnatal mother for 3 days (or) at least three home visits. Care of new born in the home 10 – Conduct health education groups of mothers and individuals – 2 each

3. Identify high risk antenatal mothers and give care – 3 observe caesarean section – two - prepare

for caesarian section – two observe abnormal deliveries -5 Prepare for MTP and observe procedures
-2 Take care of women with abortion-2

4. Prepare and assist number of cases may be from clinical, community sterilization of 5 female and 2 Male cases, perform number of cases may be from clinical (01) community the following
Insects IUCDS – 5 Oral pills-5, condoms-5 other methods-5

Educate eligible couples on different methods contraception – perform/assist with the following
contraceptive methods IUCD – Insertion – Oral pills, condoms, Sterilization, other methods.

General Paper

MSHW504T: Drug Management (Theory) (Credit-4)

1. Types of drugs

Different systems of medicine: Classification of drugs – Forms and characteristics of drugs – Abbreviations used in medication – Administration of drugs – policies and regulations, as per protocols and standing orders- classification of drugs.

2. Administration of drugs.

Routes of administration – Oral, parental (intramuscular, intradermal, subcutaneous, intravenous) rectal, local and others Administration of drugs precautions, principles safety measures observation and recording.

3. Drugs used in Minor Ailments.

Common drugs for fever, cold and cough, aches and pains, loose motions – Drug kit in the sub centre, content and its use – Storage and care of drugs.

4. Common Emergency Drugs

I.V fluids, antibiotics, injections and magnesium Sulphate, Deriphylline, avil and other anti histamine, vitamin K, anti rabies vaccine, ante snake venoms as per the protocol, precautions for administration.

MSHW504P: Drug Management (Practical) (Credit-2)

Give care to sick people at Upgraded PHC/CHC/District hospital/Area Hospital. Assess and take care of Sick patients with different diseases.

MSHW505T:Management of Hospital Services System (Theory) (Credit-4)

1.Health centre

SC/PHC/CHC – Organization of functions, facilities, records and reports
Centre activity plans –
Conduct of clinics and special programmes –Transfer systems.

2.Health Team

Concept of health team – Importance of Team approach – Staffing pattern in SC/PHC/CHC
Roles and responsibilities of each member in the team.

3.Legal and Medical Issues in Hospitals

Law and establishment of hospitals-private / public hospitals, legal requirements under medical council Acts. West Bengal Clinical Establishment Act and rules 2017 (as amended to date). Legal aspects relating to organ transplantation, MTP Act, 1971, Basics of Drugs and Cosmetic Acts, anaesthesia. ESI Act, PNDT Act, AERB, ICMR Guideline of Scientific Research Members, clinical trials.

4.Management of Hospital Services

4.1.Out Patient Services

Overview of the department, daycare, accident and emergency services, physical medicine and rehabilitation, occupational therapy unit, physiotherapy department

4.2.In Patient Services

Nursing service and ward management, critical care services – ICU, CCU, NICU, medical services, surgical services – operation theater, nuclear medicine, burn unit, nursing services, and administration.

4.3.Speciality Services

Pediatrics, OBG & GYN, ENT, Ophthalmology, Orthopedic, Psychiatry, Anaesthesia, Dental

4.4. Super-speciality Services

Cardiology, Thoracic Surgery, Neurology, Neurosurgery, Nephrology-
Dialysis Unit, Transplantation Services.

4.5.Support Services

Diagnostic-Radiology & Imaging Services, Hospital Laboratory, etc, Blood Bank & Transfusion Services, Ambulance Services, Pharmacy, CSSD, Oxygen Manifold/ Concentrator, Dietary Service, Hospital Laundry and Linen, Medical Social Worker, Marketing and Public Relations, Finance, and Administrative Departments, Outsourcing.

4.6. Utility Services

Housekeeping, Hospital Engineering and Maintenance, Biomedical Department, Central Stores, and Purchase Department, Medical Records-confidentiality of records, reception, enquiry, registration, and admission, central billing and accounts, Cafeteria/canteen, Mortuary.

5. Miscellaneous

Hospital Acquired Infection (HAI)- Committee formation and reporting, Fire safety in a hospital classification of fire, the procedure for evacuation. Telemedicine- introduction, importance, practice guidelines-protocols & Standards as per NMCN.

6. Maintenance of stocks :

Maintenance of supplies, drugs, equipment, stock indenting – calculation of indents as per population requirement – Management Information and Evaluation System (MIES) – Maintenance of stock records and reports.

7. Population Education and Family Welfare :

Population trends in India – Vital statistics, birth and death rates, growth rate, NRR, fertility rate, couple protection rate, family size – Role of mass media and IEC – Identification of eligible couples and those need contraceptive methods – information related to contraception and importance of choice – Natural and temporary methods of contraception – Permanent methods – New methods – Nor plant and injectables – Emergency contraception – follow up of contraceptive users – Role of MSHW.

8. Co-ordination :

Inter sectoral co-ordination – Co-ordination with village health guides – School teacher, AWWs – ASHA – NGOs – Other Governmental organizations.

9. Implementation of National Health Programme

National Health Programmes and role of the MSHW.

10. Staff development –

Continuing education for staff development – Methods of staff development – Interview education programmes, circulars, handouts, journals, meetings.

11. Health Insurance

Concepts of insurance, life and nonlife, Government Health Insurance Scheme (State & Central Level). Operations in Health Insurance: Introduction to Claims management, the significance of claims settlement, nature of claims from various classes of insurance, the role of Third Party

Administrators. Risk assessment, underwriting, and premium setting. Marketing and servicing of Health Insurance, Different elements of insurance marketing, uniqueness of insurance markets, distribution Channels for selling insurance: role of regulatory authority in supervising promotional activities

12. Inventory Control and Management

12.1. Hospital Inventory Management

Definition of inventory- Need of control, objectives of inventory control, impact on the profitability of the organization, different types of hospital inventories, categories of materials in hospital as un-expendable and expendable, classification of un-expendable items, hospital maintenance items, spare parts stocking policies for capital items.

12.2. Inventory Control

Selective inventory controls- the concept of selective inventory control, basis, and use of different types of selective controls-ABC, VED, FSN, SDE, and mixed methods. A brief introduction to HML, GOLF, and XYZ system. Costs associated with inventories – Ordering cost, carrying cost, over-stocking cost, under-stocking cost, and Relevance of service level. Derivation of EOQ formula, reasons to modify EOQ to suit real-life situations, the effect of quantity and price discounts on EOQ. Just in time Lead-time analysis, elements of lead-time Inventory models: safety stocks, fixation of re-order level and desired inventory level, designing of Q and P models of inventory control. Supply Chain Management (SCM): Concept of SCM, components, hospital supply chain management, global competitive scenario. **Hospital Stores Management** Hospital Stores Organization: Objective, function, relevance, and importance of store keeping, functions, and responsibilities of stores, elements of good stores organization, stores organization in hospitals: centralized and decentralized stores. Stores layout, principles for building designs for stores, factors influencing stores layout, storage facility, bin location, Stock accounting and stock recording are different methods of stock verification, investigation of discrepancies, reconciliation, stock adjustment, writing off, and stock valuation. Stock valuation methods -LIFO, FIFO, Brief Introduction of Simple and weighted average method.

MSHW505P: Hospital Information System and Medical Record System (Theory) (Credit-2)

Health care quality management.

IPD and OPD reception

Medical records

Invention management

Patient care management

MSHW506P: Visit a Multispecialty hospital/Nursing Home and Preparation of Project (Theory)
(Credit-2)

Visit a Multispecialty hospital/Nursing Home and Preparation of Project and prepare a report and present.

Sixth semester Detailed Syllabus
B.Voc in Multi Skilled Health Worker
3rd Year (Semester-6)

MSHW600P: Details syllabus Credit 30

Students Industrial Attachment Internship

Students will complete 6 months Internship in the Industry Partner Health Point Hospital, Kolkata.

They will perform and engage with various activities in various departments/section of hospital include:

1. MEDICAL RECORDS DEPARTMENT.
2. OPD.
3. IPD RECEPTION.
4. OT.
5. ICU.
6. NURSING CARE.
7. UTILITY AND HOUSEKEEPING.
8. OPERATIONS.

Students prepare reports separately regarding various activities in various departments/ section of hospital and present it separately before examination board.