

Curriculum
for the
Two Years' Post Matric Competency Based
Diploma in
Public Health Technology
(New Scheme)

First Edition 2013



Punjab Medical Faculty

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Preface

After introduction of the new service structure for Allied Health Professionals (AHPs) in 2012, the qualification requirement for entry in service has been changed to a diploma of two years' duration. This decision has necessitated the development of curricula for the new scheme of studies. The evolving health needs of the community, exponential advances in medical and allied technologies and changes in health services provision, functions and structure also demand continual and responsive changes in education and training programs meant for AHPs. The revised curricula would carry out the following important functions:

- link pre-service education and training with actual tasks AHPs have to perform after being employed, especially in the public sector
- modernize training program by weeding out subjects that have become obsolete and including subjects that are currently considered essential
- provide clarity on subjects and topics to be taught delimiting the breadth and depth of teaching
- give clarity to examiners on what is to be tested and how
- stimulate critical faculties of both teachers and students to conceptualize topics rather than memorizing them.

Focus of the new curricula would be on integration of tasks and multi-skilling of students. Thus there would be a common knowledge base for all courses in the form of a *Core Course* which would provide insight into essential technical knowledge besides providing base for development of the education for Allied Health Sciences up to post graduate level. The goal of this document has been to outline a common body of knowledge that is essential for entry-level public health technicians.

The new curriculum for Public Health Technology replaces and augments the previous curriculum for Sanitary Inspectors. This needs based curriculum places practical skills development at high priority. The successful students will have a broader horizon, have multiple skills and will be competent to perform duties of existing cadres of Sanitary Inspectors, Vaccinators and Communicable Diseases Supervisors. This training program will cater to needs of the following cadres depicted in the new service rules for allied health professionals (2012): Public Health, PHC, Healthcare Outreach, and Nutrition.

General Outline

Aim of this curriculum is to equip students with the relevant professional knowledge, skills and techniques to enable them to apply their acquired expertise for efficient health service delivery. At the end of training the student should be able exhibit the following general and specific competencies:

A. General learning objectives

1. Act upon his / her job description ethically keeping in mind the requirements of community and people at large.
2. Demonstrate empathy and humane approach towards communities and exhibit interpersonal behavior in accordance with the societal norms and expectations.
3. Demonstrate sufficient understanding of basic sciences related to his technology and be able to integrate such knowledge in his / her work.
4. Play the assigned role in the implementation of national health programs.

B. Specific learning objectives:

A student should gain knowledge, develop competencies and be enabled to:

1. Act as observer and participating in all activities of public health importance taking place at district and municipal levels.
2. Appreciate and understand different laws of public health significance.
3. Demonstrate knowledge of standard charts related to health and sanitation.
4. Demonstrate different health education methods, their use and implementation.
5. Demonstrate a comprehensive knowledge of sewerage system and treatment plant.
6. Demonstrate an appropriate working knowledge of water purification plant; chlorination and inspection of well; collection of water sample from tap, canal and sending to lab.
7. Demonstrate the knowledge of waste disposal unit and sanitary latrine.
8. Demonstrate the working knowledge of the principles and practices of environmental sanitation related to food protection, environmental contamination, infectious diseases and health nuisance abatement, with some knowledge of chemistry and bacteriology.
9. Perform and interpret both physical and chemical tests using appropriate field equipment, and use critical thinking and problem-solving skills to analyze, interpret and respond to public health situations and emergencies.

C. Work activities and skills

1. Perform all the duties imposed on him / her by statutes, orders, or regulations and by any by-laws or instructions of the local authority for protection and promotion of health of the communities.

2. Collect information of communicable diseases (also called infectious or contagious diseases) and epidemics within his jurisdiction and give immediate notice to the health officer of the occurrence of the same; whenever it appears to him that the intervention of the health officer is necessary, he shall immediately inform the health officer of it.
3. Attend to the instructions of the health officer with respect to any measures, such as the quarantining or disinfecting of a house or any infected person or thing, or other measures for preventing the spread of any infectious or epidemic disease of a dangerous character.
4. Promote public health whenever an opportunity arises and conduct health education sessions at schools and in communities both urban and rural focusing on general and food and water sanitation
5. Inspect all shops and places kept or used for the preparation, storage, or sale of any article of food for human consumption and examine any article therein and take such proceedings as may be necessary. This involves great attention to such premises as slaughterhouses, catering establishments, dairies and bake houses, factories, wharves, and markets.
6. To report to his local authority, any noxious or offensive businesses, trades, or manufactories established within the district and take such action as may be necessary to abate the nuisances and prevent their recurrence.
7. Safeguard the water supplies and take samples for analysis as to purity. Shall chlorinate/disinfect wells and other sources of water supply in his jurisdiction routinely (twice per year) and again if there is an epidemic.
8. To supervise the service of public cleansing (including refuse collection and disposal). This entails the organization of the collection and disposal of house and trade refuse by hygienic means in the most economic method suitable to the district.
9. Able to perform and interpret both physical and chemical tests using appropriate field equipment.
10. Control pest infestation. This requires the organization of systematic inspection and treatment of all premises and sewers liable to infestation by rodents and such action as is necessary to abate infestation.
11. Must properly collect and handle samples of dust, gases, vapors, and other potentially toxic materials to ensure personal safety and accurate test results.
12. At the RHC/BHU level he shall be called to inspect residential, commercial and industrial sewerage system lines before being laid. He shall inspect open drains and issue notices wherever necessary.
13. Shall assist other designated personnel in performing emergency duties during disasters; he shall collect water samples during floods and provide first aid to victims of floods, bomb blasts and earthquakes; he shall provide first aid to victim of haemorrhage, wounds, burns, asphyxia, shock, poisoning, foreign bodies, snake and insect bites, heat exhaustion and heat stroke where necessary..

D. Distribution of Training Time

The two years' program would be divided in three distinct parts (Papers). There will be a 'Core Course' which would be common for all technologies. The examination for this component will be taken at the end of first academic year. The teaching for specific aspect of this technology will be divided in two sections; examination for these will be held at the end of second academic year – however, teaching for specific techniques will start from the first year.

A typical training day for students at training institutions routinely comprises of five hours. Keeping a generous allowance of holidays and weekends, an academic year for students would be 200 days. Therefore, 1000 teaching hours would be available in 12 months. In the new scheme of studies, for the Core Course the proportion of classroom teaching and practical training (applied learning activities) would be 60:40; whereas this proportion for the specific techniques would be 40:60 and the time allocations for dividing teaching time between various topics, units and sub-units will be done accordingly as depicted below:

Core Course	500
Section I (Paper I)	750
Section II (Paper II)	750
Total	2000

The marks distribution for this diploma would be:

Subject	Marks
First Year	
Core Course	100
Viva	100
Second Year	
Section I	100
Section II	100
Practical / Viva Section I	100
Practical / Viva Section II	100
Total:	600

E. Essential Teaching Requirements

I. Training requirements/instructional methodologies (Process)

- a. Teaching staff will be given in-service training as recommended by PMF from time to time.
- b. Teachers will use a combination of interactive programmed instructions (non-IT), class teaching with exercises using audiovisual aids, mini-lectures, group discussions, simulations and case studies as instructional/teaching methodologies.
- c. IT will be employed for teaching where necessary.
- d. A combination of English and Urdu languages will be used as medium of instruction.
- e. Teachers will encourage students to ask questions; they will encourage debate and discussion in class to inspire and hone thinking skills of students. Students will be given the opportunity to engage in activities that promote divergent thinking skills. Students will be encouraged to work independently, as well as in small groups and as a whole class, to form creative associations of ideas across discipline lines.

II. Practical learning component

Practical training will supplement teaching of basic subjects. Field learning will be carried out with districts and municipal health administration and at related places of public health significance. Teachers will ensure that students are given field learning activities that are relevant to the topic being taught in the class in order for them to develop relevant practical skills.

The detail of specifications for the institution imparting education according to the new scheme of studies – including the facilities for practical attachment – is available in ‘New Affiliation Criteria’ for such institutions.

F Organization of Units of Curriculum

The different units presented in the subsequent sections would comprise of the following components, not essentially in the sequence depicted below:

- a. Learning Focus (contents, hours, weightage for assessment)
- b. Rationale
- c. Scope
- d. Learning Objectives (aims and learning outcomes)
- e. Practical Learning Component (where applicable)

G Revisions and Updating of Curriculum

The curricula are ever evolving organic documents. Regular reviews and revisions are, therefore, essentially required to keep them in pace with modern needs; topics that are required now might outlive their utility in a few years. Updating curricula therefore forms the basis for quality teaching as well as professional competence of AHPs. This would be ensured by technology-wise panels of experts notified by the Health Department.

SECTION 1

(Paper I)

Unit 1	Communicable Diseases Control
Unit 2	Elementary Entomology and Parasitology
Unit 3	Immunity and Vaccination
Unit 4	Vector Born Diseases
Unit 5	Public Health Administration
Unit 6	Vital Statistics

Unit 1

Control of Communicable Diseases

1. Learning Focus	
Sources, channels and transmission of infections	15 hour
Classification of infections	10 hour
Common water born diseases	15 hours
Common air born diseases	10 hours
Measures for controlling infections	10 hour
Class Room Teaching	60 hours
Practical Attachments	50 hours
Total Teaching	110 hours
Weightage for assessment	30%

2. Rationale

The overall understanding of mechanism of spread of infectious diseases would help PHTs to better perform their primary task i.e. prevention and control of diseases. The **goal** of this unit, therefore, is to impart an appreciation of the broader concepts of sources of infections and identification of specific communicable diseases in order to participate in prevention and control programs.

3. Scope

This unit would focus on imparting concepts of causation, spread and manifestation of diseases of communicable nature. Only broad areas would be covered and treatment component would not be included. The diseases briefly covered would include: diarrhea and dysenteries, enteric group of fever, trachoma, influenza, T.B., diphtheria, infective hepatitis, scabies, mumps, measles, chicken pox, poliomyelitis, anthrax, tetanus, yellow fever, brucellosis, rabies, whooping cough, leprosy, AIDS, malaria, cholera and plague.

4. Learning Objectives

After completing unit 1 the students will be able to:

- i. define Incubation and infective periods; carrier states
- ii. appreciate the spread mechanisms of communicable diseases
- iii. categorize common diseases of infectious nature
- iv. list out notifiable diseases
- v. describe the steps for controlling infections: notification; early detection and prompt treatment; isolation; disinfection; investigation of attack of illness
- vi. describe management of biting animals

Unit 2

Elementary Entomology and Parasitology

1. Learning Focus	
Common protozoa (Plasmodium, E. histolytica)	10 hours
Common insects of medical importance	15 hours
Broad outline of morphology and life history of important vectors	15 hours
Common helminthes (round, hook, thread, tap worms)	10 hours
Class Room Teaching	50 hours
Practical Attachments	50 hours
Total Teaching	100 hours
Weightage for assessment	25%

2. Rationale

Public health is a comprehensive subject and deals in particular with the mode of transmission of communicable diseases which may be protozoal or helminthic in origin. Similarly insects act as vectors of bacteria, viruses, rickettsial and parasitic infections. A brief resume of subject is, therefore, included to assist the students in appreciating the mode of transmission and the prophylactic measures for the prevention of parasitic infections of individuals and communities.

3. Scope

Students will be apprised about the relationships between parasites, intermediate host and definite host. They will also understand the life histories of important parasites, helminthes and vectors. The parasites would include: Entamoeba histolytica and Plasmodium. The helminthes would include different intestinal worms, whereas insects would include mosquitoes transmitting malaria and dengue fevers.

4. Learning Objectives

After completing unit students will be able to:

- i. list out the important parasites, worms and insects of medical importance
- ii. understand the life cycles of important parasites, worms and insects
- iii. appreciate the mechanisms of interactions between parasites, worms and insects with humans.

Unit 3

Immunity and Vaccination

1. Learning Focus	
Antigens, antibodies and immunity	4 hours
Vaccination against communicable diseases	8 hours
Types of vaccines, their protection and side effects	6 hours
Safe injection practices and disposal of injection wastes	6 hours
Preparation and administration of vaccines	6 hours
Cold chain system	8 hours
Supplementary vaccination activities	6 hours
Class Room Teaching	40 hours
Practical Attachments	100 hours
Total Teaching	140 hours
Weightage for assessment	20%

2. Rationale

Vaccination has become the foremost activity for prevention of communicable diseases and the PHTs need to have a thorough understanding of the processes involved. The **goal** of this unit is to impart an understanding of the concept of immunity and make students proficient in the techniques of vaccination

3. Scope

This unit will prepare the PHTs to efficiently take up vaccination activities. The understanding of antigen and antibody interaction will form the basis for understanding the importance of immunization as an important public health activity. More emphasis would be on skill development and a substantial portion of this unit would be assigned for field activities. Importance of integrating immunization activities with provision of all other services would be highlighted.

4. Learning Objectives

After completing this unit students will be able to:

- i. understand the concept of immunity and its significance in prevention of diseases
- ii. list out the vaccine preventable diseases
- iii. appreciate the importance of maintenance of cold chain and significance of safe injection practices
- iv. develop skills to administer vaccines proficiently

Unit 4

Vector Born Diseases

1. Learning Focus	
Detection of cases of malaria and dengue	20 hours
Instruments and techniques for insecticidal and larvicidal activities	15 hours
Precautions and personal protection during spraying operations	15 hours
Class Room Teaching	50 hours
Practical Attachments	100 hours
Total Teaching	150 hours
Weightage for assessment	25%

2. Rationale

Even with advancements in Public Health, old vector born diseases (VBDs) like malaria are not only resurgent but have also developed drug resistance. New diseases like dengue fever are becoming endemic and pose serious threats every year. The **goal** of this unit is to make students understand interactions of parasite, vector and host and make them skillful in prevention and control activities.

3. Scope

This unit will prepare the PHTs to efficiently take up prevention and control activities for VBDs. For undertaking such activities an understanding of life cycles of both parasites and vectors will be essential. Specific larvicidal and mosquito control techniques will be taught with special focus on skill development for spraying activities.

4. Learning Objectives

After completing unit students will be able to:

- i. understand the life cycles of important parasites and vectors
- ii. skillfully undertake different vector control activities including:
 - a. mechanical, biological and chemical interventions
 - b. planning and execution of spraying operations including important precautions

Unit 5

Public Health Administration

1. Learning Focus	
Definition of public health and preventive medicine	8 hour
Epidemiological basis for public health	12 hours
Concepts of health and disease	10 hours
Non-communicable diseases	10 hours
Levels of prevention	10 hours
Class Room Teaching	50 hours
Practical Attachments	75 hours
Total Teaching	125 hours
Weightage for assessment	25%

2. Rationale

Serving the communities and promotion of their health is the foremost responsibility of PHTs. They need to understand the principles of public health and community medicine in order to practice them. The **goal** of this unit, therefore, is to lay down the foundations for practicing public health according to the specified job description.

3. Scope

This unit will build upon the knowledge gained in core course regarding health and primary health care. Common definitions and basics of community medicine will be taught; however, details of management and supervision will not be covered.

4. Learning Objectives

After completing this unit the students will be able to:

- i. define public health and community medicine
- ii. appreciate the general principles of public health
- iii. practice the routines for prevention and control of diseases as part of health team members

Unit 6

Vital Statistics

1. Learning Focus	
System of registration for vital events in Pakistan (urban and rural)	12 hours
Basic measurements; different types of rates (growth, death, fertility, mortality, morbidity)	12 hours
Elementary statistical methods (means, average etc)	14 hours
Role of Public Health Technicians in data collection	12 hours
Class Room Teaching	50 hours
Practical Attachments	75 hours
Total Teaching Time	180 hours
Weightage for assessment	25%

2. Rationale

Collection and analysis of data is important for meaningfully undertaking any disease control activity. PHTs, as frontline health team members, will have an important role in this regard. The **goal** of this unit is to give a broad understanding of means of data collection, converting data into significant information and analyzing this information for formulating disease control strategies.

3. Scope

Learning and understanding will focus on means of data collection, its presentation and submission. The scope of teaching will be less than graduate and post-graduate students.

4. Learning Objectives

After completing this unit students will be able to:

- i. understand the various tools and methods of data collection i.e. census, keeping of birth and death register in village and towns and other elementary statistical methods.
- ii. perform basic statistical techniques including calculation of rates and means
- iii. prepare and submit periodical reports and returns

SECTION 2

(Paper II)

Unit 1	Food and Nutrition
Unit 2	Food Adulteration
Unit 3	General Hygiene
Unit 4	Environmental Hygiene
Unit 5	Municipal and Rural Hygiene
Unit 6	Hospital Hygiene
Unit 7	Occupational Hygiene
Unit 8	Minor Sanitary Engineering

Unit 1

Food and Nutrition

1. Learning Focus	
Important constituents of food	10 hours
Balanced diet	10 hours
Relative caloric values of different foodstuffs (cereals, pulses, fruit, meat, nuts, milk and its products, beverages etc)	10 hours
Diseases conveyed by food	10 hours
Food poisoning	10 hours
Class Room Teaching	50 hours
Practical Attachments	75 hours
Total Teaching	125 hours
Weightage for assessment	25%

2. Rationale

One important duty of PHTs would be to ensure regulation regarding food quality control. However, for this purpose a basic understanding of constituents of food, their nutritional significance and the consequences of poor food quality must be understood.

3. Scope

Students will learn about the ingredients of food and importance of balanced diet. They will also be apprised about consequences of poor food intake. This unit will lay foundations for the learning of the next one on 'Food Adulteration'.

4. Learning Objectives

After completing the unit students will be able to:

- i. Realize the importance of different constituents of food and a balanced diet
- ii. Appreciate the relative values of various food stuffs e.g., cereals, pulses, vegetables, fruits, nuts, milk products, beverages, etc.
- iii. Understand the ways diseases are caused by substandard food

Unit 2

Food Adulteration

1. Learning focus	
Elementary facts about foods and their adulteration	14 hours
Duties of PHT as a food inspector	7 hours
Food spoilage and food decay	7 hours
Methods of taking food sample and forwarding it for analysis	10 hours
Food borne diseases, investigation of cases of food poisoning	12 hours
Sanitation of eating places	7 hours
Food Acts of Pakistan Penal Code	7 hours
Class Room Teaching	50 hours
Practical Attachments	75 hours
Total Teaching Time	125 hours
Weightage for assessment	25%

2. Rationale

A society without execution of vital civic responsibility of adequate food quality is considered incomplete. Ensuring quality of food quality is one of the fundamental duties of a PHT. This function is of utmost importance for prevention of food born diseases.

3. Scope

Students will learn about basics of regulatory framework for food quality control including the concerned laws and statutory bodies established for the purpose. Emphasis will be on developing demonstrable skills in carrying out this important task, including .

4. Learning Objectives

After completing unit 4 students will be able to:

- i. Understand and implement food hygiene and food standards
- ii. Undertake inspections of eating places, slaughterhouse, food sellers
- iii. List out food born diseases

Unit 3

General Hygiene

1. Learning Focus	
Hygiene and its importance	6 hours
Good personal hygiene and disease implications of poor personal hygiene	6 hours
Cleanliness of the place of living	8 hours
Class Room Teaching	20 hours
Practical Attachments	30 hours
Total Teaching Time	50 hours
Weightage for assessment	10%

2. Rationale

One of the main roles of PHTs is to promote hygiene i.e. practices which are associated with ensuring good health, disease prevention and cleanliness. They also educate people about hygiene with a view to forming habits which will lead to a healthy mode of living. They routinely visit places where food, in one form or another, is handled such as restaurants, hotels, bakeries, slaughter houses etc and where they inspect workers' personal hygiene.

Clear concepts of hygiene will form the basis of PHT training. If their foundation of learning is weak it cannot be expected from them to do justice to their day to day job duties. This could have a far reaching hazardous impact on the health of individuals, families, communities, health facility staff and PHTs themselves. This unit addresses basic concepts of general hygiene which play a major role in promoting health and disease prevention. The **goal** of this unit is for the PHT to become proficient in general hygiene-related issues.

3. Scope

Learning will focus on developing a basic understanding of the concept of hygiene. Stress will be placed on ensuring that Public Health Technicians not only practice good hygiene themselves but can demonstrate good hygiene practices to their clients. Emphasis would be on following areas: personal habits, eating and drinking, smoking, cleanliness and physical aspects of personal hygiene including: housing, food, clothing, bathing, oral hygiene, care of hands, nails, care of face, scalp, eyes, ears, nose, feet, exercise.

4. Learning Objectives

After completing this Unit students will be able to:

- i. Define the term hygiene and its importance in maintaining health
- ii. Define and describe good personal hygiene and disease implications of poor hygiene
- iii. Describe occasions when hand washing becomes essential
- iv. Demonstrate proper hand washing technique
- v. Describe cleanliness of the place of living.

Unit 4

Environmental Hygiene

1. Learning Focus	
<ul style="list-style-type: none"> • Water <ul style="list-style-type: none"> ○ Source of water supply ○ Impurities of water ○ Methods of purification ○ Water sampling and testing 	16 hours
<ul style="list-style-type: none"> • Air <ul style="list-style-type: none"> ○ Composition and properties ○ Types of ventilation ○ Impurities of air ○ Diseases produced by impure air and their prevention ○ Purification of air 	12 hours
<ul style="list-style-type: none"> • Soil <ul style="list-style-type: none"> ○ Healthy and unhealthy soil ○ Importance of soil and limitation of soil in relation to disposal of organic wastes ○ Diseases resulting from pathogens living in soil 	12 hours
Class Room Teaching	40 hours
Practical Attachments	60 hours
Total Teaching	100 hours
Weightage for assessment	15 %

2. Rationale

PHTs play a very important role in conducting activities which are aimed at improving or maintaining the standard of basic environmental conditions affecting the well being of people. These environmental conditions include (1) clean and safe water supply, (2) clean and safe air, (3) efficient and safe industrial waste disposal and (4) adequate housing in clean and safe surroundings.

This unit addresses the basic issues related to environmental hygiene. It is important to teach students about the quality of human environment and prevention and control measures used to improve the basic environmental conditions affecting human health. Students need to know about the potential health hazards arising from consumption of unsafe water, living in bad housing, and living and working in areas where the ambient air is unclean.

3. Scope

Students will learn about air and water pollution, their causes and deleterious effects. Related to water they will acquire skills of obtaining water samples for testing and learn about water purification techniques. Learning will include topics related to soil such as its types with a special reference to sandy soil and diseases related to soil. Another aspect of environmental hygiene relates to housing; in this context learning will focus on healthy and unhealthy housing, diseases caused by residing in unhealthy houses and sanitation issues to be considered at the time of planning houses.

4. Learning Objectives

After completing this Unit students will be able to:

- i. Define the term air pollution and give examples of common air pollutants
- ii. Describe the harmful effects of air pollution on human health
- iii. Describe the World Health Organization standards for safe water
- iv. Describe water supply surveillance system
- v. Define the term water pollution and give examples of common water pollutants
- vi. Define the term water borne disease, list common examples of water borne diseases and describe their preventive measures
- vii. Describe the process and frequency of obtaining water samples and the types of testing carried out on water samples
- viii. Describe the various methods of purification of water with their advantages/disadvantages and the process of purifying water that has been stored in reservoirs
- ix. List the different types of soil
- x. List the pathogens found in soil and describe the diseases resulting from them

Unit 5

Municipal and Rural Hygiene

1. Learning Focus	
The village environment – housing and sanitation	15 hours
Village water supplies and disposal of sullage	20 hours
Disposal of dung, other animal-related material, and dead animals	15 hours
Solid waste management	10 hours
Class Room Teaching	60 hours
Practical Attachments	80 hours
Total Teaching Time	140 hours
Weightage for assessment	25%

2. Rationale

The population residing in the urban and rural areas faces various public health problems. Students will explore rural /municipal hygiene in order to understand sanitation issues that may arise for people. This knowledge will help them in preventing diseases - whether sporadic or epidemics - and promote citizens health.

3. Scope

PHTs would be enabled to deal with tasks such as giving advice on construction of latrines, wells, and hand pumps; managing safe water supply including chlorination and disinfection of wells etc. Learning will focus on water and sanitation issues related to safe water supply, proper disposal of liquid wastes (sullage), solid waste management including disposal of dung and dead animal bodies.

4. Learning Objectives

After completing this Unit students will be able to:

- i. Develop an understanding of the health problems faced by people living in rural and urban areas
- ii. Describe appropriate locations for building cattle sheds and their salient features and the correct ways of storing water and fodder for cattle
- iii. Describe sanitary hand pumps and different types of wells and latrines
- iv. Describe the protection and maintenance of ponds, methods for drawing water from ponds, and the precautionary measures taken to make pond water safe for human consumption
- v. Define the term catchment areas of drinking water and describe protection measures against impurities found in catchment areas
- vi. Describe drainage of water from villages and methods of disposal of waste water (sullage).

Unit 6

Hospital Hygiene

1. Learning Focus	
Spread of diseases by rats and rat proofing	8 hours
Prevention of bed bugs	8 hours
Cleanliness of wards and bathrooms	8 hours
Hospital waste disposal and incineration	6 hours
Class Room Teaching	30 hours
Practical Attachments	30 hours
Total Teaching Time	60 hours
Weightage for assessment	10%

2. Rationale

Hospitals are the public face of health department. Nuisance is a common happening here due to aggregation of lot of people. PHTs will have to deal with public health issues specific to hospitals. The **goal** of this unit is for the Public Health Technician to become proficient in promoting cleanliness and curbing harms caused by rodents and insects.

3. Scope

Learning will focus on developing skills for promotion of safe hygienic environment in hospitals. Students will learn about prevention of diseases spread by rats and how to perform rat proofing of hospital building. Emphasis would also be on maintaining total cleanliness in hospitals.

4. Learning Objectives

After completing Unit 1, students will be able to:

- i. Understand the issues of public health significance specific to hospitals
- ii. Execute rodent and insect proofing of hospitals

Unit 7

Occupational Hygiene

1. Learning Focus	
Types of workplace hazards and preventive measures against physical, chemical and biological hazards	15 hours
Assessment of temperature extremes (heat and cold), noise, indoor air quality, and lighting of workplace	15 hours
Prevention of accidents at workplace	15 hours
Offensive trades	15 hours
Class Room Teaching	60 hours
Practical Attachments	90 hours
Total Teaching Time	170 hours
Weightage for assessment	20%

2. Rationale

Incidence of workers' injuries and illnesses is quite high in Pakistan as workers are routinely exposed to workplace hazard. Moreover, regulations regarding occupational health and safety laws are not properly exercised. Students will explore occupational hygiene in order to understand how workplace hazards can affect the health of people not only working in such places but also of those who work or live in the neighborhood and how to prevent them.

The **goal** of this unit is for the PHTs to learn about public health issues related to workplace.

3. Scope

This unit addresses the basic issues related to occupational hygiene. Students will learn about the different kinds of hazards that can be found in workplace, their harmful effects on the health of people working in such a place or living in its neighborhood, and about the preventive measures that could be taken against these hazards. Emphasis will be on the assessment of heat and cold extremes, noise, indoor air quality, and lighting of a workplace. They will be taught about preventive measures against accidents at workplace. Finally students will learn about the different trades that classify as offensive trades.

4. Learning Objectives

After completing this Unit students will be able to:

- i. List the different types of workplace hazards and give examples
- ii. Describe diseases and other ill effects that are caused by workplace hazards and the preventive measures which should be taken against physical, chemical and biological hazards in workplace
- iii. Describe the measures needed to prevent accidents at workplace
- iv. Describe the various offensive trades, businesses, and processes
- v. Describe the steps needed to preserve health and welfare of workers in non-industrial establishments
- vi. Demonstrate skills needed to assess heat and cold extremes, noise, indoor air quality, and lighting of workplace and describe the effects of extreme cold and heat on human health
- vii. Describe the ill effects of industrial and agricultural chemicals on health.

Unit 8

Minor Sanitary Engineering

1. Learning Focus	
Conservancy system and its disadvantages	12 hours
Characteristics of sewage, sewage sampling and construction of sewage system	12 hours
Sanitary fixtures for underground sewage system	12 hours
House drainage system and surface drainage system	12 hours
Drains and pavement in villages	12 hours
Class Room Teaching	60 hours
Practical Attachments	100 hours
Total Teaching Time	160 hours
Weightage for assessment	20%

2. Rationale

At the rural level, PHT is responsible for inspecting residential, commercial and industrial sewerage system lines before they are being laid, and inspecting open drains. He takes sewage samples for the purpose of finding out how well a treatment plant is working and what operating changes may need to be made.

The **goal** of this unit is for the PHT to learn about sanitary engineering and housing.

3. Scope

This unit addresses the basic issues related to sanitary engineering. Students will explore sanitary engineering-related issues such as sewers, sewage treatment, and waste water treatment to gain skills primarily for maintaining the cleanliness of the area under their jurisdiction and for achieving the ultimate goal of disease prevention. They will also be taught about sewage system – its construction, characteristics of sewage and sewage sampling techniques with an emphasis on precautions needed for sampling. Additional topics will include components and principles of house drainage system, surface drainage system including its essential criteria and shapes, slope of house drains, and various methods of construction of drains and pavements.

4. Learning Objectives

After completing this Unit students will be able to:

- i. Define and describe conservancy system and disadvantages of disposal of waste by this system
- ii. Describe the various phases of construction of sewage system and the sanitary fixtures for underground sewage system
- iii. Describe the physical, chemical and biological characteristics of sewage and demonstrate skills in obtaining sewage samples and observing the precautions that need to be taken during sampling
- iv. Define the term house drainage system and describe its characteristics, principles and components
- v. Describe the characteristics of surface drainage system and various shapes of surface drains
- vi. Describe the characteristics of drains and various ways of constructing drains
- vii. Describe the need for paving lanes and markets in rural areas.

Section 3

Practical Training Component

Practical training will form an important part of pre-service education for PHTs. Practical training will comprise of field learning attachments, demonstrations and visits to sites of public health significance. Students will also receive practical training in the form of apprenticeship to acquire demonstrable skills which would help them in the execution of their duties once being employed. It is this aspect of the course that will determine the level of professionalism PHTs will display after employment.

During the two years of this program the students will be placed in different sections depicted below on a roster basis to gain practical experience in relevant areas under supervision of tutors and field officers.

Students will maintain a record of their attachment in the 'Practical Note Books' (one for each section), the last portion of which would be designed as a 'Log Book' which shall be a work diary and record. Special mention shall be made of the procedures, if any, conducted by the candidate. This diary shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the practical /viva examination.

Duration of this component would be 900 hours (nine months). The subject-wise details of this component are:

A: Communicable Diseases Control

Duration: three months

Field Attachments: District Officer (Health)

1. Control of Infections (6 days)
 - Measures for controlling infections
 - Process of notification of diseases
 - Visit of TB Hospital / Clinic

2. Immunization – attachment EPI Centre / teams (6 weeks)
 - Preparation and administration of EPI vaccines
 - Safe injection practices and disposal of injection wastes
 - Supplementary vaccination activities
 - Demonstration of Cold Chain System

3. Control of Vector Born Diseases (5 weeks)
 - Instruments and techniques of insecticidal and larvicidal activities
 - Demonstrations: Insects and parasites of medical significance

B: Public Health Practice

Duration: three months

Field Attachments: District Officer (Health) and Tehsil / Town Municipal Administration

- **Apprenticeship with Food Inspector**
 - Collection of food samples and launching of prosecutions.

- **Visits**

Students will be taken for day trips to the following food-related businesses

 - Ice cream factories
 - Beverage manufacturing factories
 - Milk packing factories
 - Bakeries
 - Meat/fish/poultry/vegetable markets
 - S slaughter houses, butcheries
 - Food selling stores
 - Hotels/restaurants.

- **Demonstrations**
 - Sanitary requirements in respect of slaughter houses and animal handlers
 - Inspection slaughtered meat at slaughter houses
 - Birth and death registration at office of Union Council
 - DHIS section of EDO(H) office

C: Hygiene

Duration: three months

Field Attachments: District Officer (Health) and Tehsil/Town Municipal Administration

- **Apprenticeship with Sanitary Inspector**
 - Observation of task assigned to Sanitary Inspector

- **Visits**

Students will be taken for day trips to the following:

- **Water/sewage sanitation-related sites**
 - Water supply sources
 - Water supply
 - Water supply in villages via sanitary wells, hand pumps and ponds, and catchment areas of drinking water
 - Sewage treatment plants
 - Sewage disposal plant and broad irrigation system of sewage disposal
 - Septic tank
 - Swimming pools
 - Slow sand filter
 - Collection and disposal of refuse and human excreta (dumping, trenching, water carriage system, septic tanks, activated sludge plants).
- **Rural Areas**
 - Dwellings built in sandy areas
 - Sheds, fodder and water storage areas and watering places for cattle, places for storage of grains and other food items for human consumption
 - Safe disposal of waste water, manure and dead animals
 - Conservancy system, house drains, surface drainage system, and pavements.
- **Transportation**
 - Airport, Railway Station, Bus Stand
- **Hospitals (for Hospital Hygiene)**
 - DHQ Hospital
 - TB Hospital / Clinic
 -
- **Other sites**
 - Cantonment Boards
 - Cinemas
 - Chemical industries
 - Schools
 - Offensive trades/businesses
- **Demonstrations**
 - **General hygiene**
 - Execute proper hand washing techniques
 - Inspection for personal hygiene.

- **Municipal hygiene**
 - Points to be noted and action to be taken while making a sanitary round of residential areas, shopping areas and residential cum shopping areas including practical application of health laws, by-laws, regulations.

- **Environmental Hygiene**
 - Examine ventilation of different types of buildings
 - Collect water sample from taps, wells and canals

- **Occupational Hygiene**
 - Examine temperature (heat and cold), noise, indoor air quality and lighting at workplaces.

- **Rural Hygiene**
 - Inspect and chlorinate wells
 - Conduct rat proofing.

- **Sanitary engineering and housing**
 - Carry out maintenance of underground sewers and conduct manhole inspections
 - Activated sludge method of sewage disposal
 - Collect sewage samples.
 - Learn about solid waste management

Recommended Reading for Teachers

1. Ilyas, Shah and Ansari; Community Medicine and Public Health; 5th Edition 2000; Time Publishers, Karachi
2. Essentials of Anatomy and Physiology by Seely, Stephens, and Tate (4th ed)
3. General Anatomy by Dr Ghulam Ahmad
4. Essential of Medical Physiology Vol.I & II by Mushtaq Ahmad.
5. Practical Sanitation: A Handbook for Sanitary Inspectors and Others;With Apx. On Sanitary Law, by Herbert Manley by George Reid
6. Practical Sanitation: A Handbook for Sanitary Inspectors and Others Interested in Sanitation by George Reid and Herbert Manley
7. Sanitary Inspectors' Practical Guide: With Inspection of Lodging-Houses (Under Sanitary Acts) and the Sale of Food & Drugs Amendment Act, 1879 for Sanitary ... and Local Board Districts of England by Joseph Robinson
8. Sanitary Inspector's Handbook;: A manual for sanitary inspectors and other executive public health officers, by Henry Hurrell Clay
9. Elementary Sanitary Engineering in India;: A text-book for Indian sanitary inspectors and others interested in the application of the science of sanitary engineering to tropical conditions, by George Bransby Williams
10. The Australian sanitary inspector's text book / by John L. Bruce and Theodore Mailler Kendall
11. Sanitary Inspector, Volume IV by Maine State Board Of Health.
12. Food Hygiene Microbiology and HACCP By S. J. Forsythe, P. R. Hayes.
13. Food Hygiene and Sanitation by Sunetra Roday.
14. Textbook Clinical Occupational and Environmental Medicine 2005 by Rosenstock

Acknowledgments

Grateful acknowledgement is hereby made to Dr Simon Azariah and Dr Nighat Farooqi from CIDA funded System Oriented Health Investment Project (SOHIP) for their initial work on this topic.

I am also indebted to Dr Ahsan Mahmood Gondal, Registrar PMF for providing assistance in completion of this task.

Above all, my gratitude goes to Dr Mohammad Anwar Janjua, Additional Secretary (Technical), Health Department for his valuable co-operation and contribution in completing this difficult task.

July – 2013

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