

PATHOLOGY & MICROBIOLOGY

A. Subject aims:

The aims of the subject is to acquaint the students with aetiology and pathology of the diseases, to enable them to formulate and interpret laboratory investigation and to correlate with the principle of homoeopathy and shall enable the student to:-

1. impart and improve the community health;
2. carryout bedside laboratory tests;
3. interpret laboratory result and understand their implications;
4. develop attitude and knowledge for research in the subject.

Study of pathology must be in relation with the concept of miasm an evolved by Dr. Hahnemann. Student should be taught the importance of susceptibility and immunity which explains the homoeopathic concepts of disease and cure.

B. Subject objective:

1. understand the mechanism and pathological processes of producing diseases.
2. correlate with the other subjects taught to in the pre-clinical, para-clinical and clinical subjects of this course.

C. Course composition & teaching hours:

1. Lectures 200 hours,
 2. Tutorial, discussion, etc50 hours.
 3. Practical & demonstrations....100 hours
- 350 hours.

D. Evaluation in the Second professional BHMS examination:

Theory(MCQ-25%+75%SAQ)).....	200 marks
Two papers (100+100)	
Practical	200 marks
[2 experiments-	40 × 2 = 80
Instruments (spotting)-	40
Table viva	20
Practical Note Book	10
Oral/viva-voce	50]
	400 marks

**PATHOLOGY & MICROBIOLOGY
PAPER-I
HOM-203A**

**Detailed Course contents
(PATHOLOGY)**

1. Introduction,

- * Definition of pathology;
- * Historical background of pathology;
- * Meaning of aetiology, pathogenesis and pathology;
- * Branches of pathology-- general pathology, haematology, bacteriology, immunology, parasitology and virology & mycology.
- * Conception of pathology from the homoeopathic point of view.

2. General pathology:

- (a) Injurious agent and their effects on cells:

- Reversible cellular damage-- cloudy swelling, hydropic degeneration, vacular degeneration, fatty changes, glycogen infiltration and hyaline change;
 - Irreversible damage-- Necrosis & Gangrene: Apoptosis.
- (b) Inflammatory responses: definition, classification, cardinal sign.
- * Acute inflammation:
 - Definition and causes,
 - Vascular changes,
 - Formation of inflammatory exudates, Phagocytosis.
 - Tissue changes,
 - Complications of acute inflammation,
 - Fate of acute inflammation;
 - Chemical mediators.
 - * Chronic inflammation:
 - Definition aetiology, classification and characteristics.
 - Non-specific and granulomatous,
 - Fate of chronic inflammation;
- (c) Healing(repair):
- Healing of inflammatory tissue damages in regeneration and repair,
 - Wound healing-- by primary union (1st. intention), and by secondary union (2nd.intention),
 - Wound contraction-- formation, character and functions of granulation tissues,
 - Factors influencing wound healing,
 - Complications of wound healing;
- (d) Oedema:
- Pathogenesis and mechanism – localized and generalized,

- Types of clinical oedema-- cardiac, renal, pulmonary, nutritional and hepatic,
- (e) Hyperaemia and congestion:
 - Causes and mechanism of hyperaemia and congestion,
 - Tissue changes in hyperaemia and congestion;
- (f) Haemorrhage:
 - Effects of haemorrhage and compensatory mechanism,
 - Shock-- definition, types and compensatory mechanism of shock, effects of shock in different organs;
- (g) Coagulation disorders: Thrombosis-
 - Pathogenesis- thrombus formation in heart, arterial and venous system.
 - Effect of thrombi,
 - Fate of thrombi.
- (h) Embolism:
 - Definition and types of emboli,
 - Effects and fate of emboli;
 - Pulmonary embolism.
- (i) Infarction:
 - Definition and types,
 - Pathogenesis, common site of infarct,
 - Tissue changes in infarct,
 - Fate of infarct;
 - Infarction of heart.
 - Ischaemia- definition, cause, effects.
 - Thrombosis- definition, cause, commonsites, effects, fates.
- (j) Disorder of pigment metabolism: bilirubin, iron.
- (k) Immunology:
 - The immunological system- its development,

- The antigens and antibodies,
- Mechanism of antibody formation,
- Antigen-antibody reactions,
- Immunity-- natural and acquired immunity,
- Methods of inducing immunity (active & passive immunity),
- Immunological disorders,
- Hypersensitivity states.

(l) Autoimmune disorder- mechanism,

(m) Growth disorder:

- Hypertrophy, atrophy, hyperplasia, metaplasia, dysplasia, hypoplasia, agenesis, aplasia; anaplasia.

(n) Neoplasia:

- Definition, aetiology, pathogenesis,
- Classification of tumours,
- Common benign tumours of epithelial and connective tissues,
- Common malignant tumours of epithelial and connective tissues,
- Characteristics of benign and malignant tumours,
- precancerous lesion
- Spread of malignant tumours, Metastasis.
- Grading and staging of malignant tumours,
- Laboratory diagnosis- biopsy, exfoliative cytology.

3. Haematology:

(a) Blood :

- Composition of blood, normal values of RBC, haemoglobin, WBC & platelets, haematocrit values, ESR, formation of blood.

Important Haematological diseases:

(b) Anaemia:

- Definition and classification of anaemia,
- Deficiency anaemia-- iron deficiency anaemia, megaloblastic anaemia,
- Anaemia associated with various diseases-- haemorrhage, infection, renal failure, liver disease, malignancy, collagen diseases,
- Haemolytic anaemia-- causes and types.
- Aplastic anaemia;
- (c) Haemoglobinopathies:
 - Sick cell anaemia,
 - Thalassemia;
- (d) Leucocytosis, leucopenia;
- (e) Lymphocytosis, Eosinophilia, Polycythemia;
- (f) Leukaemia:
 - Definitions and classification,
 - Acute leukaemia,
 - Chronic leukaemias;
- (g) Haemorrhagic disorder;
 - Purpura-- definition, types and causes.
 - Coagulation time, Bleeding time, Prothrombin time,
 - Bone marrow examination.
- (h) Blood groupings and blood transfusion
 - (i) Systemic pathology-
 - Diseases of alimentary system
 - Diseases of cardiovascular system
 - Diseases of respiratory system
 - Diseases of endocrine glands

PATHOLOGY & MICROBIOLOGY
PAPER-II
HOM-203B

Detailed Course contents
(MICROBIOLOGY)

Courses on microbiology- Introduction to microbiology- historical survey. The subject microbiology includes- bacteriology, virology, mycology and parasitology.

4. Bacteriology:

- * Introduction to bacteriology and its necessity;
- * Study of bacteria :
 - methods of study--examination under microscope-
 - (1) hanging drop preparation,
 - (2) staining (Gram's staining, AFB staining);
- * Bacterial anatomy;
- * Classification of bacteria(different types)
- * Bacterial cultivation-
 - culture media-- classification and uses;
- * Sterilization and disinfection- methods and uses;
- * Bacterial pathogenesis and bacterial infection;
- * Bacterial metabolites-- bacterial toxins;
- * Staining of bacteria, Infection;
- * Systemic bacteriology:

Study of different bacteria. In systemic bacteriology the students will be required to know the different strains of bacteria and the diseases they produce. Cultural characteristics, colonial appearances and biochemical activities of the bacteria should not be made essential for the students to learn. However, the students should be able to identify the common

organisms in the culture plates in the practical class room and in the practical examinations. Teaching should include systemic study (morphology, staining & cultural characters, pathogenesis and laboratory diagnosis) of the following bacteria-

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|---------------------------|--------------------------------|
| - (i) Staphylococci, | - (ix) Proteus, |
| - (ii) Streptococci, | - (x) Vibrios (Comma bacilli), |
| - (iii) Pneumococci, | - (xi) Bordetella, |
| - (iv) Niesseria group, | - (xii) Corynebacterium group, |
| - (v) Coliform group, | - (xiii) Mycobacterium group, |
| - (vi) Salmonella, | - (xiv) Clostridium group, |
| - (vii) Shigella, | - (xv) Spirochetes. |
| - (viii) Eschericia coli, | - (xvi) Bacillus anthraxis |

5. Toxaemia, septicaemia, bacteraemia.

6. Virology:

- * General characteristics of viruses- structure, composition, classifications, multiplication
- * Viral infections-host's response to viral infections, virus immunology,
- * Characteristic feature, Pathogenesis and laboratory diagnosis of the common viruses -
 - Poxvirus,
 - Herpes virus,
 - Adenovirus,
 - Rubella,
 - Common cold
 - Enteroviruses (poliomyelitis, septic meningitis),
 - Hepatitis viruses (Hepatitis-A, B & C),
 - HIV Virus,
 - Rabies virus,
 - Measles Virus,
 - Mumps Virus.

7. Mycology:

- * Classification of fungus,
- * General characteristics of common fungus,
- * The common pathogenic fungus—classifications, diseases produced by them and laboratory diagnosis.

8. Parasitology:

- * Definition & introduction of medical parasitology in relation to common parasitic diseases in Bangladesh and their broad classification.
- * Host-parasite relationship.
- * General mode of infection.
- * Protozoa- classification.
 - Rhizopoda- classification, morphology, life cycle, pathogenesis, pathology, laboratory diagnosis of *Entamoeba histolytica* (amoebiasis).
 - Mastigophora- classification, morphology, life cycle, pathogenesis, pathology, laboratory diagnosis of *Leishmania donovani* (kala-azar).
 - *Giardia lamblia* & *trichomonias*- life cycle, pathogenesis, pathology, laboratory diagnosis.
 - Sporozoa- classification, morphology, life cycle, pathogenesis, pathology and laboratory diagnosis of *Plasmodia* (malaria), *Toxoplasma*.
- * Helminthology- broad classification.
 - Cestodes (Tape worm)- classification.
 - = *Taenia saginata* & *Taenia solium*- habitat, morphology, life cycle, pathogenicity, and laboratory diagnosis.

- = Echinococcus granulosus- habitat, morphology, life cycle, pathogenicity, and laboratory diagnosis.
- Trematodes- classification, morphology, life cycle and pathogenesis of Fasciolopsis buski.
- Nematodes- classification, general characteristics and life cycle.
- = Ascaris lumbricoides- habitat, morphology, life cycle, pathogenicity, and laboratory diagnosis.
- = Ankylostoma duodenale & N. americanus- habitat, morphology, life cycle, pathogenicity, and laboratory diagnosis.
- = Trichuris trichiura, Enterobius vermicularis- habitat, morphology, life cycle, pathogenicity, and laboratory diagnosis.
- = Wuchereria bancrofti- habitat, morphology, life cycle, pathogenicity, and laboratory diagnosis.

9. Systemic pathology-

- Common disorders of central nervous system.
- Disease of Urinary system.
- Common disorders of male and female genital organs.
- Skeletal and muscular disorders.
- Common skin disorders.

PRACTICAL

General pathology:

1. Introduction: Records & Note Book.
2. Histopathology: Slides of abscess, acute appendicitis, ulcer, granulomas (TB node), chronic cholecystitis, adenocarcinoma, squamous cell carcinoma.

Haematology:

3. Introduction: Records & Note Book.
4. Collection of blood for different purpose, anti-coagulants.
5. Estimation of haemoglobin.
6. Total counts of WBC, RBC, platelets, circulating eosinophils.
7. Differential count of WBC.
8. PCV and haematocrit values.
9. Estimation of ESR.
10. Making and staining of blood films, Leishman's stain.
11. Demonstration of osmotic fragility tests.
12. Bleeding time and coagulation time.

Microbiology:

13. Introduction: Records & Note Book.
14. Use of microscope and care of the instruments.
15. Sterilization- demonstration of different methods of sterilization, sterilization of media.
16. Media- different media, preparation, uses and disposal.
17. Staining procedure:
 - Gram staining,
 - AFB staining.

17. Study of common bacteria- isolation and Identification of individual bacteria.
18. Demonstration of serological tests: Widal test, V.D.R.L, Anti-Streptolysin-O Titre (ASO titre) test, ABO blood grouping.

Clinical pathology:

19. Examination of Stool- ME/RE (macroscopic & microscope demonstration should include ova of parasites, cysts of protozoa), occult blood test.
20. Examination of Urine- ME/RE (macroscopic & microscope and chemical test for albumin, sugar, urobilinogen), pregnancy test.
21. Examination of sputum- (macroscopic and microscopic) Gram and AFB stain.
21. Examination of pus- (Gram & AFB stain).
22. Semen analysis.
23. Blood sugar (Fasting & random sugar), Blood urea, Serum cholesterol, Serum bilirubin.

Demonstration of morbid specimen:

24. Disorder of cardiovascular system, respiratory system, kidney, female reproductive organs, and breast.

Practical Note Book

The Practical Note Book for practical works must be maintained by the student and signed with remarks of the teacher and that must be submitted along with the progress card during Examinations for evaluation by the examiners.