B.D.S COURSE
MICROBIOLOGY / SYLLABUS

(With effect from 2010-11 onwards)
GENERAL MICROBIOLOGY

a) AIMS:
To introduce the students to the exciting world of microbes. To make the students aware of various branches of microbiology and the role of microbes in human diseases. The objectives of teaching microbiology can be achieved by various teaching techniques such as:
- Lectures
- Lecture Demonstrations
- Practical exercises
- Audio visual aids
- Small group discussions with regular feedback from the students.

b) OBJECTIVES:

i. Knowledge and Understanding
At the end of the Microbiology course the student is expected to:
1. Understand the basics of various branches of microbiology and able to apply the knowledge relevantly.
3. Understand and practice various methods of Sterilisation and disinfection in dental clinics.
4. Have a sound understanding of various infectious diseases and lesions in the oral cavity.

ii. Skills
1. Student should have acquired the skill to diagnose, differentiate various oral lesions.
2. Should be able to select, collect and transport clinical specimens to the laboratory.
3. Should be able to carry out proper aseptic procedures in the dental clinic.

c) COURSE CONTENT:
A brief syllabus of Microbiology is given as follows:

i. General microbiology:
3. Detail account of Sterilisation and Disinfection.
4. Brief account of Culture media and Culture techniques.
5. Basic knowledge of selection, collection, transport, processing of clinical specimens and identification of bacteria.

ii. Immunology:
1. Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease.
2. Immunity
3. Structure and functions of Immune system
4. The Complement System
5. Antigen
(6) Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body.
(7) Immune response
(8) Antigen - Antibody reactions - with reference to clinical utility.
(9) Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.
(10) Hypersensitivity reactions
(11) Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures.
(12) Immunology of Transplantation and Malignancy
(13) Immune haematology

iii. Systematic bacteriology:
(1) Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus Meningococcus - brief account of each coccus - detailed account of mode of spread laboratory diagnosis, Chemotherapy and prevention.
(2) Detailed account of Cariogenic Streptococci
(3) Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation.
(4) Mycobacteria - Tuberculosis and Leprosy
(5) Clostridium - Gas gangrene, food poisoning and tetanus.
(6) Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.
(7) Spirochaetes - Treponema pallidum - detailed account of Oral Lesions of syphilis, Borrelia vincentii, Actinomycetes.

iv. Virology:
(1) Introduction
(2) General properties, cultivation, host - virus interaction with special reference to Interferon.
(3) Brief account of Laboratory diagnosis, Chemotherapy and immunoprophylaxis in general.
(4) A few viruses of relevance to dentistry.
   a) Herpes Virus
   b) Hepatitis B Virus - brief about other types
   c) Human Immunodeficiency Virus (HIV)
   d) Mumps Virus
   e) Brief- Measles and Rubella Virus
(5) Bacteriophage - structure and Significance

v. Mycology:
(1) Brief Introduction
(2) Candidosis - in detail
(3) Briefly on oral lesions of systemic mycoses.

vi. Parasitology:
(1) Brief introduction - protozoans and helminths
(2) Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.
f) **Theory: 65 Hours**

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<th>Hours</th>
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<td>1. Introduction, History and classification.</td>
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<td>2. Morphology, Physiology of Bacterial cell.</td>
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<td>3. Bacterial Genetics</td>
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<td>4. Infection</td>
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<td>2. Antigen</td>
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<td>3. Antibodies</td>
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<td>4. Structures and functions of Immune system</td>
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<td>6. Antigen and antigen reactions &amp; compliment</td>
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<td>7. Hypersensitivity</td>
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<td>8. Autoimmunity</td>
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<td>9. Immunology of transplantation</td>
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<td>2. Streptococci (Dental Caries)</td>
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<td>3. Pneumococci</td>
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<td>4. Meningococci &amp; Gonococci</td>
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<td>5. Corynebacterium diphtheria</td>
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<td>6. Bacillus</td>
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<td>7. Clostridia</td>
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<td>8. Non sporing Anaerobes</td>
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<td>9. Mycobacteria</td>
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<td>10. Spirochaetes (Treponema, leptospira and Borrelia)</td>
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<td>11. Normal bacterial flora of the Oral Cavity</td>
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<td><strong>IV. VIROLOGY</strong></td>
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<td>1. General properties of viruses</td>
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<td>2. Herpesviruses</td>
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<td>3. Measles and Mumps</td>
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<td>4. Rabiesvirus.</td>
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<td>5. Hepatitisviruses</td>
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<td>6. Human Immunodeficiency Virus (HIV)</td>
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<td>7. Oncogenic viruses &amp; Poliomyelitis</td>
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<td><strong>V. PARASITOLOGY</strong></td>
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<td>1. Introduction to parasitic diseases</td>
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<td>2. Entamoeba histolytica, Malaria, Leishmania</td>
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<td><strong>VI. MYCOLOGY</strong></td>
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<td>2. Rhinosporidiosis</td>
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<td><strong>VII. APPLIED MICROBIOLOGY</strong></td>
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<td>1. Immunisations chedule, Collection of materials, Experimental animals &amp; hospital infections – in brief</td>
<td>02</td>
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vii. **Practicals/Demonstrations: 50 Hours**

1. **Demonstrations:**
   a) Morphological forms of microbes
   b) Different morphological forms of bacteria, viruses, fungi, parasites.
c) Sterilization Methods – Specified techniques – their uses.
d) Culture Media – transport media
e) Special staining techniques, stained preparations – dark ground microscopy.
f) Demonstration of bacteria in stained clinical material.
g) Demonstration of viruses – Permanent preparations morphology, inclusion bodies.

(2) **Practicals:**
   a) Simple staining of bacteria
   b) Gram’s staining – isolated bacteria – Clinical materials.
c) Ziehl-Neelsen staining – prepared and fixed smears.
d) Collection of materials for culture – pus, blood.

(3) **List of practical materials slides for demonstration:**
   a) Staphylococcus
   b) Streptococcus
   c) Gonococcus
   d) Pneumococcus
   e) Mycobacterium Tuberculosis
   f) Mycobacterium leprae
   g) Anthrax
   h) Cl. Tetani
   i) Spirochaetes
   j) Gram Negative Bacilli
   k) Candida
   l) Actinomyces

(4) **Slides for practical exercises:**
   a) Grams stains  
      (i) Staphylococci  
      (ii) Gram negative bacilli  
      (iii) Mixture of any two organisms  
      (iv) Gram stain of the oral cavity  
   b) Alberts stain–Kleb's Loffeler's Bacilli(KLB) culture, slide  
   c) Ziehl-Neelson's stain - Sputum positive for AFB

(5) **Media for demonstration:**
   i. Un-inoculated media:
      (i) Nutrient agar plate  
      (ii) Blood agar plate  
      (iii) Chocolate agar plate  
      (iv) Macconkey agar plate  
      (v) Glucose citrate broth(Blood culture bottle)  
      (vi) Lowenstein Johnson's Mediaslope  
      (vii) Loefflers serum slope  
      (viii) Sabourauds slope  
      (ix) Milk agar plate  
      (x) Robert Cooked Meat broth  
   ii. Inoculated media:
      (i) Nutrient agar with staphylococci
(ii) Blood Agar with Alpha Haemolytic Streptococci
(iii) Blood Agar with Beta Haemolytic Streptococci
(iv) Potassium Tellurite with growth of C. diphtheriae
(v) Milk agar with staphylococci
(vi) Antibiocis sensitivity plate

iii. Animals:
(i) Guinea pig
(ii) Rabbit
(iii) Mice

iv. Instruments:
(i) VDRL slide
(ii) Tuberculin syringe
(iii) Sterile swab
(iv) Seitz filter
(v) MacIntosh Fildes jar
(vi) Widal rack with tubes
(vii) Micro titre plate
(viii) Disposable syringe
(ix) Surgical gloves

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d) Scheme of Examination

1. Theory

Distribution of Topics and Type of Questions for University written examination:

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<td>One question from Immunology</td>
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<td>One question from Systematic Bacteriology</td>
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<td>One question from General bacteriology</td>
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<td>One question from Systematic Bacteriology</td>
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<tr>
<td>Two questions from Virology</td>
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| Total                                           |                                   |       |

(1) University written Examination: 50Marks
(2) University Viva: 15Marks
(3) Internal Assessment: 10 Marks

iv. Practicals:

(1) Internal Assessment: 10 Marks
(2) University Practicals: 40Marks

Grand Total 125Marks

Mark distribution for University practical examination

Spotters
- Slides: 5x 2 Marks
- Media: 3x2 Marks
- Instruments: 2x2 Marks
- Gram's Stain: 7 Marks
- Ziehl-Neelsen's Stain: 8 Marks
- Practical work record: 5 Marks