Throughout the Microbiology course, attempts are made at emphasizing those infectious diseases that are of great actual or potential importance to humans.

**Aims & Intended Learning Outcomes**

**Aims of the Course**
- To provide students with the latest information in scientific microbiological methods.
- To provide advanced knowledge, understanding, and critical judgment appropriate for the medical profession in microbiology.

**Intended Learning Outcomes of the Course:**

* At the end of the course the student should be able to:
* Describe in details the morphology, the culture, spread, biochemical activities, antigenic characters, pathogenesis, laboratory diagnosis, treatment & prevention & control measures of each bacteria.
* Define the organs commonly involved in the infection.
* Recall the relationship of this infection to symptoms, relapse and the accompanying pathology.
* Explain the methods of microorganisms control, e.g. chemotherapy & vaccines.
* Solve problems in the context of this understanding.
* Demonstrate practical skills in fundamental microbiological techniques.
* Present and interpret results obtained from using these techniques.
* Present information clearly in both written and oral form.
Course objectives of Microbiology:

Objectives of medical Microbiology are classified into ultimate objectives which to be fulfilled by the end of the course and the sub-objectives which to be conducted during the whole course to achieve the ultimate objectives.

ULTIMATE OBJECTIVES:
The students will acquire fairly good knowledge about endemic bacteria & viral infectious diseases, its impact upon health in UAE and the universe.

The different modules enclosed below will contain the different bacteria, viruses & fungi causing different infections in different systems of the body.

Outline of the course content:
Students are obliged to attend all scheduled meetings of the class.

Course Structure
The course in Medical Microbiology covers Bacteriology, virology and Mycology as enclosed below.

Throughout this course, considerable emphasis is laid on the medical aspects of Microbiology including:
1. Identification of bacteria, viruses & fungi
2. Morphology.
3. Cultural characters.
4. Biochemical activities.
5. Treatment.
6. Prevention & control.

INSTRUCTION MEDIA AND METHODS OF TEACHING

1. Programmed Lectures:
   Lecturing program: 89 hours teaching lectures, distributed upon 2 semesters of the 2nd academic year. 76 hour teaching lectures, distributed upon 2 semesters of the 1st academic year. The lectures are given by senior academic staff, who has experience in teaching, delivering lectures.
   - Participation of students is essential, they are informed previously about the topic of the lecture.
   - In the beginning of the lecture, the teacher inquires about students’ expectation and sets objectives of the lecture.
   - Some important points of the previous lecture are asked about.
   - Students ask about non-clear points and the teacher joins the previous with the new lecture.
   - Teacher proposes some simple problems to be solved by students currently during the lecture.
   - At the end, a summary of the content is presented by 2 or 3 students. Followed by organized summary by the teacher.
• Visual aids like transparencies, power point presentations are used in the lecture.
• Audio - visual video films are also used to illustrate and clarify theoretical lectures and make it easier to remember.

2. Practical attachment: Students are going to have practical classes of total 64 hours, in both semesters arranged according to the syllabus each session 2 hours, this applies for 1st & 2nd years.

3. Problem solving sessions. A teacher chairs the sessions and relevant tropical problems are discussed.

4. Seminar: Elective Seminar are going to be chosen by students ,presented and discussed together with other related department.

Practical Sessions:
*Practical sessions are very important to confirm the theoretical data that have been taught in lectures, so the practical sessions and the lectures are considered complementary to each other.
*Practical session is designed to identify different types of bacteria & viruses from the morphological point of view.
*At the end we can consider Microbiology an important subject in medicine as it touches deeply a lot of branches e.g. medical laboratories and tropical medicine.

Examination Procedures:
**Setting of papers:** Question papers are written and reviewed by internal examiners and checked by the External Examiner in oral examination day.
**Marking:** Answer books are corrected and marked by the internal examiner.
**Board of Examiners:** This committee of both internal and the external Examiner evaluate all students during oral examination.
Students Evaluation Procedure:
Assessment of Microbiology Coursework
The total marks for microbiology subject in 1st year are 60 marks & for 2nd year total mark is 90 which are distributed as listed below:

Year Assessment Marks count for 30% of the final grade:
Class sharing
Class sharing counts for 5% of students final grade.
Seminars
Seminars marks count for 5% of students final grade.
Attendance
Attendance counts for 5% of students final grade.

Final Exams Marks count for 70% of the final grade:
Written Papers
Written papers count for 35% of students final grade.
Oral exam. marks
Oral marks count for 20% of students final grade.
Practical exam. marks
Practical marks count for 20% of students final grade.
Developments achieved in year 2004-2005

I) Educational (theoretical & practical achievements:

1- Practical session have been introduced for First Year students. A total of 56 hrs, on a weekly basis of 2 hrs month December, February, March, April, May, June. July.
   - These practical sessions included practical demonstrations for students.
   - Active participation of students in preparing & cultivating bacteriological media at microbiology labs of DMCG.
   - Active participation of students in performing bacteriological staining technique at microbiology labs of DMCG.
   - Active participation of students to perform antibiogram at microbiology labs of DMCG.
2- Hospital Fields studies to visit hospital microbial labs and Dubai Medical Center Hospital.
3- Seminars held at the department in relating to their microbiological studies.
4- Encouragement of self learning by case presentation curried by 2-3 students, presented guided discussed by the Prof. Nadia Mokhless.
5- This was performed on weekly basis in a session of 2 hours (topics enclosed below)

II) Administrative achievements:

1. Official visit to Al-Ain Emirates University microbiology department to update DMCG microbiology laboratories & courses.
2. Reestablishment of new microbiology lab equipments (enclosed below).
3. Integration of Microbiology & Immunology in the integrated "Organ system course) booklets previously followed by other departments.
4. Reestablishment of booklet of microbiology (Theoretical Practical) that includes introductive to the course, objectives, prerequisites, out course.
5. Composition of the department assessment files including the following:
   - Course file checklist.
   - Portfolios and recitals.
   - Department assessment forms.
   - Plan of Department.
   - Syllabus.
   - Department progress.
   - Handouts.
   - Final exam & MCQ questions.
   - Results.
6. Composition of a course of molecular & bacterial genetics.
7. Renewal of DMCG library & its enforcement with journal, books, e-journals.

Plan Of Development In Microbiology Department

1. Stressing more on the case study as to our opinion, it is crucial to the students in the pre-clinical phase. Thus our future plan to direct the teaching method towards case study and problem solving.
2. Annual addition of more fixed microbiology slides to the practical sessions plus addition of colored labeled charts for different bacteria & viruses.
3. Planned cooperation with Dubai medical center to allow students to prepare and examine fresh smears for different bacteria.
4. Establishment of a new microbiology laboratory
5. Establishment of correlation between DMCG students & hospital medical laboratories.
6. Establishment of correlation between DMCG students & Infection Control units in the hospitals.
MICROBIOLOGY COURSE CONTENT

MICROBIOLOGY COURSE CONTENT FOR FIRST YEAR
GENERAL MICROBIOLOGY AND IMMUNOLOGY

I) General microbiology:
By the end of the course the student should:
1. Learn the morphology & bacterial cell structure.
2. Define bacterial spore structure, sporulation, & germination.
3. Understand bacterial physiology, growth & metabolism.
4. Learn about antimicrobial chemotherapy & bacterial drug resistance.
5. Understand & learn about genetics including mutation, genetic transfer between bacteria & genetic recombination.
6. Define & understand the mechanism of normal flora of human body at different anatomical sites.
7. Understand pathogenesis & virulence factors of bacteria.

II) General Virology:
1. Understand general properties of viruses, including morphology, classification & others.
2. Learn about bacteriophage.
3. Understand the immune response to viral infection.
4. Understand & learn about interferon including types, mechanism of action & its clinical application.
5. Recognise different group of antiviral drugs used for treatment of viral infections.
6. Understand concept of viral vaccine.

III) General mycology:
1. Understand basic mycology.
2. Learn structure & growth.
3. Understand pathogenesis.
4. Define fungal toxins
5. Define methods of laboratory diagnosis.
6. Know principal antifungal therapy.
7. Get acquainted with classification of medically important fungi.

IV) Immunology:
1. Understand the mechanism & types of immune systems of the human body.
2. Learn about the human immune system.
3. Define cells of the immune system.
4. Define events taking place in specific immune response.
5. Define types of antigens.
6. Understand & learn about complement system: including classical & alternative pathway & their outcomes.
7. Define types of immunoglobulins; both structure & function.
8. Know about different antigen – antibody reactions applied for laboratory diagnosis.
9. Understand the major histocompatibility antigens & their clinical significance.
10. Learn about cytokines.
11. Define immunological tolerance.
12. Define immunodeficiency diseases (congenital & acquired)
13. Learn about hypersensitivity reactions & its types.
14. Learn about autoimmune diseases.
15. Define transplantation antigens & graft rejection.
16. Understand the tumour immunology.
MICROBIOLOGY COURSE CONTENT FOR SECOND YEAR
SYSTEMIC MICROBIOLOGY

CVS MODULE
GENERAL MODULE

PREREQUISITES FOR THE GENERAL MODULE:

- The student should have good basis of eukaryotic cell.
- The student should have good basis on the difference between eukaryotic & prokaryotic cell.

1. Bacterial
   a) Introduction & Classification
   b) Bacterial cell structure.
   c) Bacterial physiology & growth-Pathogenesis
   d) Bacterial genetics
   e) Antimicrobial chemotherapy
   f) Microbial flora of human body.

Objectives:
The student should be able to:
   a) Discuss the classification of bacteria.
   b) Describe the bacterial cell structure.
   c) Explain the bacterial physiology & growth-Pathogenesis.
   d) Discuss the bacterial genetics.
   e) Discuss about Antibacterial chemotherapy & Drug resistance.

2. General Virology:
   a) General properties & Classification
   b) Virus replication
   c) Laboratory diagnosis
   d) Host response to viral infection.
   e) Interferon
   f) Antiviral
   g) Viral vaccine
   h) Bacteriophage

Objectives:
The student should be able to:
   a) Discuss about classification of virus
   b) Describe the viral cell structure.
   c) Explain viral physiology & growth-Pathogenesis.
   d) Describe viral genetics.
   e) Discuss about Antiviral chemotherapy & Drug resistance.
   f) Discuss viral vaccines
3. General mycology

Objectives:

The student should be able to:

a) Discuss about classification of fungi.
b) Describe the fungal cell structure.
c) Explain fungal physiology & growth-Pathogenesis.
d) Describe fungal genetics.
e) Discuss about Antifungal chemotherapy & Drug resistance.

At the end of the practical session the student should be able to explain the following concepts:

General

1. Safety precautions in the laboratory.
2. Microscope
3. Morphology of bacteria
4. Sterilization
5. Culture media
6. Cultivation of bacteria
7. Identification of bacteria
8. Anaerobiosis
9. Antibiogram

Immunology:

1. Antigen-antibody reaction

Laboratory diagnosis of viral infections:

1. Sampling
2. Direct detection [EM, FAT, immunodiffusion, ELISA, NA probing, PCR]
3. Virus isolation [Tissue culture, Chick embryo, Animal inoculation]
4. Serology [IF, ELISA, CFT, HAI]
5. Immunoblotting technique

PREREQUISITES FOR THE CARDIOVASCULAR SYSTEM:

- The student should have good basis in anatomy & histology of the heart, pericardium, blood vessels.
- The student should have good basis in physiology & pathology of the heart, pericardium, blood vessels.
- The student should have good basis of immunology.
- The student should have good basis of general microbiology.

Rheumatic fever

Objectives

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. group A streptococci
- Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
• At the end of this practical session the student should be able to explain the following concepts:
  1. ASOT
  2. Blood Culture [[Sampling, isolation, identification, serotyping, new molecular techniques, antibiogram]

Pericarditis

Objectives
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition
  e.g. Viral: Coxsackie B
  Bacterial: Staphylococci, Haemophilus Influenza
  Tuberculosis: Mycobacterium TB.
  Syphilis: Treponema Pallidium
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Discuss & apply various diagnostic methods.
• Discuss the basic concept of treatment.
• At the end of this practical session the student should be able to explain the following concepts:
  1. Blood Culture [Sampling, isolation, identification, serotyping, new molecular techniques, antibiogram]
  2. Viral diagnosis:
     a) Serlogical methods
     b) PCR [DNA/RNA]

Myocarditis

Objectives
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition
  e.g. Virus: Coxsackie B, Influenza, rubella, Polio, Adenovirus, Echovirus
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
• At the end of this practical session the student should be able to explain & apply the following concepts:
  3. Blood Culture [Sampling, isolation, identification, serotyping, new molecular techniques, antibiogram]
  4. Viral diagnosis:
     a) Serlogical methods
     b) PCR [DNA/RNA]
**Infective Endocarditis**

**Objectives**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Streptococci viridians, Streptococci group C,G, Enterococci fecalis, Staphylococcus aureus, Staphylococcus epidermidis, Haemophilus influenza, Haphrophilus, Histoplasma, Brucella, Candida, Aspergillus, Coxiella burnetti.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

At the end of this practical session the student should be able to explain the following concepts:
- Blood Culture [Sampling, isolation, identification, serotyping, new molecular techniques, antibiogram]

**Infection of blood vessels**

**Objectives**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition
  i) e.g. Haemorrhagic fever: Arbovirus: EEV, WNF, California Encephalitis Virus, Crimean Congo virus, RVF virus, Sandfly fever virus, Y-fever virus.
  ii) Vasculitis & Thrombosis: Rickettsiae.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

At the end of this practical session the student should be able to explain the following concepts:
1. Blood Culture [[Sampling, isolation, identification, serotyping, new molecular techniques, antibiogram]
2. Viral diagnosis:
   a) Direct detection of antigen & nucleic acid detection.
   b) Isolation
   c) Serological methods.

d) **KS: HHV**

**Objectives**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
RESPIRATORY MODULE

PREREQUISITES FOR RESPIRATORY SYSTEM:

- The student should have good basis in anatomy & histology of the nose, larynx, trachea, bronchi, bronchioles & the lungs.
- The student should have good basis in physiology & pathology of the nose, larynx, trachea, bronchi, bronchioles & the lungs.
- The student should have good basis of immunology.
- The student should have good basis of General microbiology.

UPPER RESPIRATORY TRACT INFECTIONS:

Diseases of the nose (Rhinoscleroma)

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should be able to explain the following concepts:
  a) Culture [Sampling, Isolation, Identification, Serotyping, Antibiogram]
  b) Direct antigen detection kits

Viral Diagnosis:
- a) Serology
- b) PCR [Detection of RNA/DNA]

Common cold

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. rhinovirus, coronavirus.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should be able to explain the following concepts:
  a) Culture [Sampling, Isolation, Identification, Serotyping, Antibiogram]
b) Direct antigen detection kits

**Viral Diagnosis:**

a) Serology  
  b) PCR [Detection of RNA/DNA]

**Sinusitis**

**Objectives:**

**At the end of this session the student should be able to:**

- List the different etiological agents involved in this condition e.g. Streptococci pneumoniae, Haemophilus Influenza  
- Describe the basic characteristics of each microorganism.  
- Explain the underlying pathogenesis/modes of spread  
- Recognise the clinical features.  
- Describe & apply various diagnostic methods.  
- Discuss the basic concept of treatment.

**Adenotonsillitis**

**Objectives:**

**At the end of this session the student should be able to:**

- List the different etiological agents involved in this condition e.g. Bacterial: streptococci, staphylococci, pneumococci, Corynaebacterium Diphteriae  
  Viral: Rhinovirus, adenovirus & enterovirus  
- Describe the basic characteristics of each microorganism.  
- Explain the underlying pathogenesis/modes of spread  
- Recognise the clinical features.  
- Describe & apply various diagnostic methods.  
- Discuss the basic concept of treatment.

**Pharyngitis**

**Objectives:**

**At the end of this session the student should be able to:**

- List the different etiological agents involved in this condition e.g. Bacterial: streptococci, staphylococci, pneumococci, Corynaebacterium Diphteriae, Vincent’s spirillum  
  Viral: Enterovirus, Coxsackie A virus  
  TB pharyngitis: ulceration & tuberculoma  
- Describe the basic characteristics of each microorganism.  
- Explain the underlying pathogenesis/modes of spread  
- Recognise the clinical features.  
- Describe & apply various diagnostic methods.  
- Discuss the basic concept of treatment.  
- At the end of this practical session the student should be able to explain the following concepts:  
  a) Culture [Sampling, Isolation, Identification, Serotyping, Antibiogram]  
  b) Direct antigen detection kits
Viral Diagnosis:

a) Serology  
b) PCR [Detection of RNA/DNA]

Syphilis

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Treponema Pallidium.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

Infectious mononucleosis & Nasopharyngeal carcinoma

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Ebstein Barr virus.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should be able to explain the following concepts:
  a) Culture [Sampling, Isolation, Identification, Serotyping, Antibiogram]
  b) Direct antigen detection kits

Viral Diagnosis:
- a) Serology  
- b) PCR [Detection of RNA/DNA]

Acute laryngotracheobronchitis

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Parainfluenza virus type2, Haemophilus Influenza type B.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
Acute Epiglottitis

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Haemophilus Influenza.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

Ear:

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Otitis externa: Staphylococcus aureus, Pseudomonas pyocaenus
  Otitis media: Streptococci pneumoniae, Haemophilus Influenza, Streptococcus Pyogenus.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should be able to explain the following concepts:
  a) Culture [Sampling, Isolation, Identification, Serotyping, Antibiogram]
  b) Direct antigen detection kits

Viral Diagnosis:

- Serology
- PCR [Detection of RNA/DNA]

Influenza:

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Influenza virus A & B
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
**LOWER RESPIRATORY TRACT INFECTION:**

**Bronchitis & Bronchial Asthma**

**Objectives:**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition
  e.g. Bacterial: Streptococci pneumoniae, Haemophilus Influenza
  Viral: Respiratory Syncytial Virus.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should be able to explain:

  Sputum Examination & Culture [ Sampling, processing, isolation, identification, serotyping, antibiogram]

**Cystic Fibrosis**

**Objectives:**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition
  e.g. Respiratory tract infection is caused by Pseudomonas.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

**Pneumonia**

**Objectives:**

At the end of this session the student should be able to:

- Enumerate the different etiological agents involved in this condition
  e.g. Bacterial: Streptococci pneumoniae, Mycoplasma pneumoniae, Haemophilus
  Influenza, Chlamydia psittaci, Chlamydia pneumoniae, Staphylococcus aureus,
  Coxiella burnetti, Legionella pneumophilia, Klebsiella pneumoniae, Pseudomonas
  aeruginosa, Moraxella catarrhalis, Bacterioids.
  Viral: Influenza virus, Adenovirus, Varicella zoster, Cytomegalovirus, SARS,
  Parainfluenza virus, Measels, Respiratory Syncytial Virus, Hanta virus
  (ROBO).
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should be able to explain:

  Sputum Examination & Culture [ Sampling, processing, isolation, identification, serotyping, antibiogram]
**Tuberculosis**

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Mycobacterium tuberculosis.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

**Lung abscess**

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Staphylococcus aureus, Klebsiella pneumoniae.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

**Fungal respiratory tract infection.**

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

**Infectious diseases of the Larynx & trachea (Laryngeotracheobronchitis)**

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Staphylococcus aureus, Klebsiella pneumoniae.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread.
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
Infectious diseases of Pleura.

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

GIT MODULE

PREREQUISITES FOR THE GASTROENTEROLOGY SYSTEM:

- The student should have good basis in anatomy & histology of the mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum & the anal canal.
- The student should have good basis in physiology & pathology of the mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum & the anal canal.
- The student should have good basis of immunology.
- The student should have good basis of general microbiology.

Salivary gland infection {Sialadenitis}

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Streptococci pyogenus, Staphylococci aureus & Streptococci pneumoniae.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should explain the following concepts:
  1) Specimen [saliva, gastric biopsy, aspirate, secretions]
  2) Culture, identification, antibiogram, new molecular techniques.

Parotid gland {Parotitis}

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. mumps virus.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
**Gastritis & Peptic ulcer**

Objectives:

At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Helicobacter pylori.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should explain the following concepts:
  1) Specimen [Saliva, gastric biopsy, aspirate, secretions]
  2) Culture, identification, antibiogram, new molecular techniques.

**Esophageal infections**

Objectives:

At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Candida, Herpes Simplex, Cytomegalovirus
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

**Gastroenteritis**

Objectives:

At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Bacteria: E.coli, Shigella, Salmonella, Campylobacter.
  Viruses: Rota virus (Infantile gastroenteritis)
  Norwalk virus (Adult gastroenteritis)
  Adenovirus, Coronavirus
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should explain the following concepts:
  1) Stool culture [Stool examination i.e. processing, identification, antibiogram]
  2) Blood culture
  3) Serological test
**Intestinal TB**

**Objectives:**
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Mycobacterium Tuberculosis.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

**Acute terminal ileitis**

**Objectives:**
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. yersinia.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

**Hepatitis (Acute+ Chronic)**

**Objectives:**
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Viruses: hepatitis viruses A,B,C,D,E,G, EBV, CMV, yellow fever virus.
  Bacteria: Leptospira icterohaemorrhagiae, Coxiella burnetti.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should explain the following concepts:
  1) Serological profile [ELISA TEST]
  2) PCR [DNA/RNA]
  3) Quantitative PCR

**Bacterial peritonitis**

**Objectives:**
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. E.coli, klebsiella & enterococci, clostridia, pseudomonas, bacteriods.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
At the end of this practical session the student should explain the following concepts:
1) Specimen [Saliva, gastric biopsy, aspirate, secretions]
2) Culture, identification, antibiogram, new molecular techniques.

Hepatocellular carcinoma
Objectives:
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition e.g. HBV, HCV.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment

Liver abscess
Objectives:
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition e.g. Streptococci faecalis, Proteus vulgaris, E.coli, Staphylococci aureus, Streptococci milleri & anaerobic organisms such as Bacteriodes.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
• At the end of this practical session the student should explain the following concepts:
  1) Specimen [Saliva, gastric biopsy, aspirate, secretions]
  2) Culture, identification, antibiogram, new molecular techniques.

Diseases of the Pancreas [Pancreatitis]
Objectives:
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition e.g. Mumps, Coxsackie B.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
• At the end of this practical session the student should explain the following concepts:
  1) Specimen [Saliva, gastric biopsy, aspirate, secretions]
  2) Culture, identification, antibiogram, new molecular techniques.
**Pseudomembranous colitis**

**Objectives:**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Clostridium Difficile.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment

**Appendix**

**Objectives:**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment

**Diseases of the Gall Bladder**

**Objectives:**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment
PREREQUISITES FOR RENAL MODULE SYSTEM:

The student should have good basis in:
- Anatomy, histology, physiology & pathology of the Kidneys, Ureter, Bladder, Urethra.
- The student should have good basis of immunology.
- Biochemistry of Renal function test.

Diseases of the glomeruli:
Objectives:
At the end of this session the student should be able to:
1. List the different etiological agents involved in this condition e.g. Acute diffuse glomerulonephritis: Nephrogenic Lancefield group A β Haemolytic Streptococci.
2. Describe the basic characteristics of each microorganism.
3. Explain the underlying pathogenesis/modes of spread
4. Recognise the clinical features.
5. Describe & apply various diagnostic methods.
6. Discuss the basic concept of treatment.

Diseases of the Tubules & Urinary Tract Infection:
Objectives:
At the end of this session the student should be able to:
1. List the different etiological agents involved in this condition e.g. E.coli, Proteus, Klebsiella, Enterococcus faecalis, Staphylococcus epidemidis, Staphylococcus aureus, Pseudomonas, BK-virus( immunological complement), Adenovirus type 11,21 Acute haemorrhagic cystitis.
2. Describe the basic characteristics of each microorganism.
3. Explain the underlying pathogenesis/modes of spread
4. Recognise the clinical features.
5. Describe & apply various diagnostic methods.
6. Discuss the basic concept of treatment.
7. At the end of the practical session student be able to explain the following concepts:
   Urinary tract infections, TB of urinary tract:
Examination, Urine culture: a) Sampling, processing & indentification
   b) Antibiogram
   c) Colony count
   d) New molecular techniques

Tuberculosis of Urinary Tract
Objectives:
At the end of this session the student should be able to:
1. List the different etiological agents involved in this condition e.g. Mycobacterium TB infection
2. Describe the basic characteristics of each microorganism.
3. Explain the underlying pathogenesis/modes of spread
4. Recognise the clinical features.
5. Describe & apply various diagnostic methods.
6. Discuss the basic concept of treatment.

**Renal carbuncle [Renal cortex abscess]**

**Objectives:**

**At the end of this session the student should be able to:**

1. List the different etiological agents involved in this condition e.g. Blood borne Staphylococcus aureus infection.
2. Describe the basic characteristics of each microorganism.
3. Explain the underlying pathogenesis/modes of spread.
4. Recognise the clinical features.
5. Describe & apply various diagnostic methods.
6. Discuss the basic concept of treatment.

**Obstructive diseases & Calculi**

**Objectives:**

**At the end of this session the student should be able to:**

1. Enumerate the different etiological agents involved in this condition.
2. Learn the basic characteristics of each microorganism.
3. Understand the underlying pathogenesis/modes of spread.
4. Focus on clinical features.
5. Learn various diagnostic methods.
6. Understand the basic concept of treatment.

**Kidney Lesions**

**Objectives:**

**At the end of this session the student should be able to:**

1. List the different etiological agents involved in this condition e.g. Leptospira haemorrhagiae (Weil's disease)
   Hantavirus (HFRS = Haemorrhagic Fever renal Syndrome).
2. Describe the basic characteristics of each microorganism.
3. Explain the underlying pathogenesis/modes of spread.
4. Recognise the clinical features.
5. Describe & apply various diagnostic methods.
6. Discuss the basic concept of treatment.

**Infections of urinary bladder & ureter**

**Objectives:**

**At the end of this session the student should be able to:**

1. List the different etiological agents involved in this condition.
2. Describe the basic characteristics of each microorganism.
3. Explain the underlying pathogenesis/modes of spread.
4. Recognise the clinical features.
5. Describe & apply various diagnostic methods.
6. Discuss the basic concept of treatment.
**Urethritis**

**Objectives:**

At the end of this session the student should be able to:

1. List the different etiological agents involved in this condition
   e.g. Urethritis: Non-Gonococcal: E.coli, proteus, pseudomonas, staphylococci, streptococci, Chlamidia Trachomatis(D-K), Ureaplasma urealytica, Mycoplasma hominis.
   
   Gonococcal: Nesseria gonorrhea

2. Describe the basic characteristics of each microorganism.
3. Explain the underlying pathogenesis/modes of spread
4. Recognise the clinical features.
5. Describe & apply various diagnostic methods.
6. Discuss the basic concept of treatment.

7. At the end of the practical session student be able to explain the following concepts:

   Urethral swab culture: a) Sampling, processing & indentification
   b) Antibiogram
   c) New molecular techniques

   Viral diagnosis: a) Sampling
   b) Antigen detection
   c) Nucleic acid detection
   d) Viral isolation
   e) Serology

**Case study**

**Case study**

**GIT MODULE**

**PREREQUISITES FOR THE GASTROENTEROLOGY SYSTEM:**

- The student should have good basis in anatomy & histology of the mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum & the anal canal.
- The student should have good basis in physiology & pathology of the mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum & the anal canal.
- The student should have good basis of immunology.
- The student should have good basis of general microbiology.

**Salivary gland infection {Sialadenitis}**

**Objectives:**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Streptococci pyogenus, Staphylococci aureus & Streptococci pneumoniae.
- Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
• At the end of this practical session the student should explain the following concepts:
  3) Specimen [saliva, gastric biopsy, aspirate, secretions]
  4) Culture, identification, antibiogram, new molecular techniques.

**Parotid gland {Parotitis}**

**Objectives:**
**At the end of this session the student should be able to:**
• List the different etiological agents involved in this condition e.g. mumps virus.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.

**Gastritis & Peptic ulcer**

**Objectives:**
**At the end of this session the student should be able to:**
• List the different etiological agents involved in this condition e.g. Helicobacter pylori.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
• At the end of this practical session the student should explain the following concepts:
  1) Specimen [Saliva, gastric biopsy, aspirate, secretions]
  3) Culture, identification, antibiogram, new molecular techniques.

**Esophageal infections**

**Objectives:**
**At the end of this session the student should be able to:**
• List the different etiological agents involved in this condition e.g. Candida, Herpes Simplex, Cytomegalovirus
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
Gastroenteritis

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition
e.g. Bacteria: E.coli, Shigella, Salmonella, Campylobacter.
Viruses: Rota virus (Infantile gastroenteritis)
    Norwalk virus (Adult gastroenteritis)
    Adenovirus, Coronovirus
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should explain the following concepts:
  4) Stool culture [Stool examination i.e. processing, identification, antibiogram]
  5) Blood culture
  6) Serological test

Intestinal TB

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g.
  Mycobacterium Tuberculosis.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

Acute terminal ileitis

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. yersinia.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

Hepatitis (Acute+ Chronic)

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Viruses: hepatitis viruses A,B,C,D,E,G, EBV, CMV, yellow fever virus.
    Bacteria: Leptospira icterohaemorrhagiae, Coxiella burnetti.
- Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
• At the end of this practical session the student should explain the following concepts:
  4) Serological profile [ELISA TEST]
  5) PCR [DNA/RNA]
  6) Quantitative PCR

**Bacterial peritonitis**

**Objectives:**

At the end of this session the student should be able to:

• List the different etiological agents involved in this condition e.g. E.coli, klebsiella & enterococci, clostridia, pseudomonas, bacterioids.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
• At the end of this practical session the student should explain the following concepts:
  4) Specimen [Saliva, gastric biopsy, aspirate, secretions]
  5) Culture, identification, antibiogram, new molecular techniques.

**Hepatocellular carcinoma**

**Objectives:**

At the end of this session the student should be able to:

• List the different etiological agents involved in this condition e.g. HBV, HCV.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment

**Liver abscess**

**Objectives:**

At the end of this session the student should be able to:

• List the different etiological agents involved in this condition e.g. Streptococci faecalis, Proteus vulgaris, E.coli, Staphylococci aureus, Streptococci milleri & anaerobic organisms such as Bacteriodes.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
• At the end of this practical session the student should explain the following concepts:
1) Specimen [Saliva, gastric biopsy, aspirate, secretions]
6) Culture, identification, antibiogram, new molecular techniques.

**Diseases of the Pancreas [Pancreatitis]**

**Objectives:**
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Mumps, Coxsackie B.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of this practical session the student should explain the following concepts:
3) Specimen [Saliva, gastric biopsy, aspirate, secretions]
4) Culture, identification, antibiogram, new molecular techniques.

**Pseudomembranous colitis**

**Objectives:**
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Clostridium Difficile.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment

**Appendix**

**Objectives:**
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment

**Diseases of the Gall Bladder**

**Objectives:**
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment
ENOCRIINE & REPRODUCTIVE MODULE

PREREQUISITES OF ENDOCRINE & REPRODUCTIVE SYSTEM:

- The student should have good basis in anatomy & histology of the endocrine glands & of the male & female reproductive organs.
- The student should have good basis in physiology & pathology of the endocrine glands & of the male & female reproductive organs.
- The student should have good basis of immunology.
- The student should have good basis of general microbiology.

Endocrine module:

*Thyroid {Thyroditis}*

**Objectives:**
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. streptococci, Haemophilus Influenza, Autoimmune thyroiditis.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Explain the basic concept of treatment.

**Pancreas:**

**Objectives:**
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Coxsackie-B virus.
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Explain the basic concept of treatment.

At the end of this practical session the student should be able to understand the following concepts:

1. Swab, Saliva, Biopsy:
   a) Sampling smear, isolation, identification, serotyping, antibiogram
   b) Serology

Infectious Diseases of Male reproductive system:

*External genitalia:*

**Objectives:**
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Bacterial: Treponema Pallidium [a,b,c/a,c,d,e,f,g]
  Viral: Herpes Simplex Virus
• Human immunodeficiency virus (HIV)
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.

**Prostatitis:**

**Objectives:**

At the end of this session the student should be able to:

• List the different etiological agents involved in this condition e.g. i)Acute:
  E.coli, Staphylococci aureus, Streptococci faecalis, Gonococci
  ii) Chronic:
  a) Chlamydia infection
  b) Inadequate treatment of acute prostatitis
  c) Secondary to cystitis & pyelonephritis
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Discuss & apply various diagnostic methods.
• Explain the basic concept of treatment.

**TB of Prostate & seminal vesicles**

**Objectives:**

At the end of this session the student should be able to:

• List the different etiological agents involved in this condition e.g. Mycobacterium Tuberculosis.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.

**Orchitis & Epididymorchitis**

**Objectives:**

At the end of this session the student should be able to:

• List the different etiological agents involved in this condition e.g. Mumps virus.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
5. Case Study

6. Case Study

**At the end of this practical session the student should be able to explain the following concepts:**

1. Urethral discharge, Urine, Swabs, Biopsy, Culture:
   a) Sampling smear, Isolation, Identification, Serotyping, Antibiogram
   b) Serology

**VIRAL IDENTIFICATION:**

a) Serological methods
b) PCR [DNA/RNA]

**Infectious Diseases of Female reproductive system:**

**Vulvitis**

**Objectives:**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition
e.g. **Viral Infection**
  a) Condylomata acuminata (viral warts): Human Papilloma virus
  b) Herpes genitalis
  c) Molluscum Contagiosum: Poxvirus

- **Bacterial Infection:**
  a) Chancaroid (soft chanchre): Haemophilus Ducreyi
  b) Gonorrhea: Neisseria gonococci
  c) Syphilis: Primary stage
  Secondary stage: Condylomata
  d) Lymphogranuloma venereum: Chlamydia Trachomatis
  e) Granuloma Inguinale: uncertain organism
  f) TB: Mycobacterium Tuberculosis, Mycoplasma Hominis
  g) Furunculosis: Staphylococcus aureus ➔ hair follicles on outer aspect of labia majora.

- **Fungal infection:**
  a) Candiasis
  
  - Describe the basic characteristics of each microorganism.
  - Explain the underlying pathogenesis/modes of spread
  - Recognise the clinical features.
  - Describe & apply various diagnostic methods.
  - Discuss the basic concept of treatment.

**Vaginitis**

**Objectives:**

At the end of this session the student should be able to:

- List the different etiological agents involved in this condition
e.g. Monilial vaginitis: Candida
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

**Cervicitis**

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition
  e.g. a) Noserria gonococci
  b) Herpes virus
  c) Human papilloma virus
  d) Cervical carcinoma: Herpes simplex virus type[1,2], Cytomegalovirus, Kaposi sarcoma [HHV.B]
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Explain the basic concept of treatment.

**Endometritis**

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition
  e.g. a) Actinomycosis
  b) Noserria gonococci
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Describe the basic concept of treatment.

**Pelvic Inflammatory Disease:**

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition
  e.g. a) Streptococci
  b) Staphylococci
  c) Gonococci
  d) E.coli
  e) Streptococci fecalis
  f) Bacteriods
  g) Mycobacterium Tuberculosis
  h) Anaerobic bacteria
- Describe the basic characteristics of each microorganism.
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.

**HIV & AIDS**

**Objectives:**
**At the end of this session the student should be able to:**
• List the different etiological agents involved in this condition.
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.

**At the end of this practical session the student should be able to explain the following concepts:**
Urethral discharge, Urine, Swabs, Biopsy, Culture:
  a) Sampling smear, isolation, identification, serotyping, antibiogram
  b) Serology

**VIRAL IDENTIFICATION:**

  a) Serological methods
  b) PCR [DNA/RNA]

**Diseases of Female Breast:**

**Mastitis: Acute & Chronic**

**Objectives:**
**At the end of this session the student should be able to:**
• List the different etiological agents involved in this condition
• Describe the basic characteristics of each microorganism.
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Explain the basic concept of treatment.

**Breast abscess**

**Objectives:**
**At the end of this session the student should be able to:**
• List the different etiological agents involved in this condition
  e.g. staphylococci, streptococci (group B), mycobacteria, treponema, mumps virus
  • Describe the basic characteristics of each microorganism.
  • Explain the underlying pathogenesis/modes of spread
  • Recognise the clinical features.
  • Describe & apply various diagnostic methods.
  • Discuss the basic concept of treatment.
3. Case study

4. Case study

CNS MODULE:
PREREQUISITES FOR THE NERVOUS SYSTEM:

- The student should have good basis in Anatomy, Histology, Physiology & Pathology of the of the brain, spinal cord & nerves.
- The student should have good basis in Biochemistry of the of the brain, spinal cord & nerves.
- The student should have good basis of immunology.
- The student should have good basis of General microbiology.

Meningitis:

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Bacteria: Nesseria meningitides, Streptococci pneumonia, Listeria monocytogenus, Gram negative bacilli, Mycobacterium TB, Treponema Pallidum.
  - Virus: Enterovirus [ECHO, Coxsackie, Polio], Mumps, Herpes simplex, HIV, EBV, Lymphocytic Choriomeningitis virus.
- Explain the basic characteristics of each microorganism.
- Describe the underlying pathogenesis/modes of spread.
- Recognize the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
- At the end of the practical session the student should explain the following concepts:
  a) CSF examination & culture:
     1. CSF culture: Sampling smear, Isolation, Identification, Serotyping, Antibiogram
     2. Blood culture
     3. Nasopharyngeal swab for detection of carriers
  b) Direct antigen detection methods.

Encephalitis:

Objectives:
At the end of this session the student should be able to:

- List the different etiological agents involved in this condition e.g. Virus: Herpes Simplex, ECHO, Coxsackie, Mumps, EBV, Adenovirus, Varicella zoster, Influenza, Measles, RVF, Rabies.
- Discuss the basic characteristics of each microorganism.
• Describe the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Discuss various diagnostic methods.
• Describe & apply the basic concept of treatment.
• At the end of the practical session the student should explain the following concepts:

1. Serological methods
2. PCR [RNA/DNA]

**Syphilis**

**Objectives:**

At the end of this session the student should be able to:

• List the different etiological agents involved in this condition e.g. Treponema pallidium
• Discuss the basic characteristics of each microorganism
• Describe the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply the various diagnostic methods.
• Discuss the basic concept of treatment.

**Rabies**

**Objectives:**

At the end of this session the student should be able to:

• List the different etiological agents involved in this condition.
• Describe the basic characteristics of each microorganism
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply the various diagnostic methods.
• Discuss the basic concept of treatment.

**Botulism**

**Objectives:**

At the end of this session the student should be able to:

• List the different etiological agents involved in this condition e.g. Clostridium.
• Describe the basic characteristics of each microorganism
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply the various diagnostic methods.
• Discuss the basic concept of treatment.

**Leprosy**

**Objectives:**

At the end of this session the student should be able to:

• List the different etiological agents involved in this condition e.g. Mycobacterium leprae
• Describe the basic characteristics of each microorganism
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply the various diagnostic methods.
• Discuss the basic concept of treatment.

**Tetanus**

**Objectives:**
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition e.g. Clostridium tetani.
• Describe the basic characteristics of each microorganism
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.

**Lyme disease**

**Objectives:**
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition.
• Describe the basic characteristics of each microorganism
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.

**Poliomyelitis**

**Objectives:**
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition e.g. Polio virus.
• Describe the basic characteristics of each microorganism
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.

**Subacute Sclerosing panencephalitis**

**Objectives:**
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition e.g. Measles
• Describe the basic characteristics of each microorganism
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.
Prionosis [Spongiform encephalopathy]

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. slow viral infections
- Describe the basic characteristics of each microorganism
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Explain & apply various diagnostic methods.
- Discuss the basic concept of treatment.

Brain abscess

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Streptococci milleri, bacteriods, staphylococci.
- Describe the basic characteristics of each microorganism
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

Brain tuberculoma

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Mycobacterium Tuberculosis.
- Describe the basic characteristics of each microorganism
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.

Spinal cord abscess

Objectives:
At the end of this session the student should be able to:
- List the different etiological agents involved in this condition e.g. Staphylococcus aureus.
- Describe the basic characteristics of each microorganism
- Explain the underlying pathogenesis/modes of spread
- Recognise the clinical features.
- Describe & apply various diagnostic methods.
- Discuss the basic concept of treatment.
Progressive multifocal leukoencephalopathy

Objectives:
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition e.g. JC- virus.
• Describe the basic characteristics of each microorganism
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment.

Multiple sclerosis

Objectives:
At the end of this session the student should be able to:
• List the different etiological agents involved in this condition e.g. Paramyxovirus
• Describe the basic characteristics of each microorganism
• Explain the underlying pathogenesis/modes of spread
• Recognise the clinical features.
• Describe & apply various diagnostic methods.
• Discuss the basic concept of treatment: