# Syllabus of Medical Microbiology (Experiment) Shandong University School of Basic Medical Sciences

Writers:

Time: 2019.9

## 1. Basic information of the course

| | | | | | |
|---|---|---|---|---|---|
| Course Name | Medical Microbiology | | | | |
| Course Code | | | | | |
| Teaching Department | Department of Medical Microbiology | | | | |
| Experiment Type | ☑Professional basic experiment ☑Professional experiment ☑Comprehensive experiment<br>☐Innovative experiment ☐Open experiment | | | | |
| Course Type | ☑Compulsory ☐Elective | | | | |
| Experimental Type | ☐Independent course ☑Non-independent course | | | | |
| For Which Major | Clinical Medicine | | | | |
| Credits | | Lecture Hours | 48 | Experiment Hours | 32 |
| Prerequisite course | | | | | |
| Website of the course | cell and molecular medicine experiment teaching platform | | | | |

## 2. Course Description

Medical Microbiology is a fundamental course with strong practicality and close relationship with clinical practice. Medical Microbiology Experiment is a practical course that complements the theoretical lecture. Through morphological observation, pathogenic cultivation and identification, and other basic techniques, Medical Microbiology Experiment consolidates students' understanding of Medical Microbiology and establish students' awareness of "sterility". It also lays the foundation for following course and clinical practice.

## 3. Course character and teaching objective

**【Teaching objectives】**

Medical Microbiology Experiment is an independent professional basic course. The main purpose and task is to enhance students' perceptual understanding of pathogenic microorganisms and strengthen students' grasp and understanding of theoretical knowledge through observing the morphology and structure of pathogenic microorganisms such as bacteria, viruses, fungi and so on. Through learning basic medical microbiology experimental operations such as bacterial culture, identification and so on, Medical Microbiology Experiment can cultivate students' awareness of "sterility", enhance students' practice and mastery of experimental diagnostic methods of pathogenic microorganisms, and cultivate students' hands-on ability and analytical ability. In addition, Through innovative experiments such as experimental design , Medical Microbiology Experiment can cultivate students' innovative thinking ability, scientific research ability and application ability of basic knowledge.

**【Teaching requirements】**

Through observing the morphology and structure of pathogenic microorganisms such as bacteria, viruses, fungi and learning basic medical microbiology experimental operations such as bacterial culture, identification etc, Medical Microbiology Experiment can cultivate students' awareness of "sterility", enhance students' practice and mastery of experimental diagnostic methods of pathogenic microorganisms, and cultivate students' hands-on ability and analytical ability.

## 4. Teaching content and teaching hour allocation

### Experiment 1 Title: Morphological observation of bacteria (4 credit hours)

**【teaching objectives and requirements】**

Observation of basic morphology and structure of bacteria, the use of oil microscope, bacterial gram staining.

**【main instruments and medicines】**

Optical microscope

**【experimental requirements】**

aseptic operation

### Experiment 2 Title: Culture of conventional bacteria (4 credit hours)

**【teaching objectives and requirements】**

Introduction to common culture medium, ultraviolet sterilization experiment, methods of bacterial culture and inoculation, observation of bacterial growth phenomenon and metabolites (name and student number are written on the marking plate) (scoring of bacterial streaking results)

**【main instruments and medicines】**

incubator, commonly used sterilization instruments: high pressure steam sterilizer

**【experimental requirements】**

aseptic operation

### Experiment 3 Title: Culture of unconventional bacteria, Microbial Antibiotic Susceptibility Test (4 credit hours)

**【teaching objectives and requirements】**

Culture of anaerobic bacteria, L-type bacteria and so on, Microbial Antibiotic Susceptibility Test, culture of skin and pharyngeal bacteria

**【main instruments and medicines】**

Optical microscope

【**experimental requirements**】

aseptic operation

## Experiment 4 Title: Isolation and identification of pathogenic cocci, culture and identification of bacteria in skin and pharynx (4 credit hours)

【**teaching objectives and requirements**】

Morphological observation of pyogenic cocci, culture characteristics of pyogenic cocci, identification of pathogenic cocci in clinical samples, plasma coagulase test of staphylococcus, culture and observation of skin and pharyngeal bacteria and identification of pharyngeal bacteria ( scoring of gram staining identification result), and arrangement of colony count experiment

【**main instruments and medicines**】

Optical microscope

【**experimental requirements**】

aseptic operation

## Experiment 5 Title: Microbiological examination of intestinal pathogenic bacteria, morphological observation and culture of mycobacterium tuberculosis (4 credit hours)

【**teaching objectives and requirements**】

Microbiological examination method of intestinal pathogenic bacteria, morphological observation of mycobacterium tuberculosis, acid-fast staining, introduction of colony count by each group, and the teacher determined the scheme

【**main instruments and medicines**】

Optical microscope

【**experimental requirements**】

aseptic operation

## Experiment 6 Title: Morphological observation and culture of virus , colony count (4 credit hours)

【teaching objectives and requirements】

Observation of virus morphology, CPE and virus inclusion bodies;Virus culture (cell culture video), colony count, and arrangement of fungal specimens

【main instruments and medicines】

Optical microscope

【experimental requirements】

aseptic operation

## Experiment 7 Title: Morphological observation and culture of fungi (4 credit hours)

【teaching objectives and requirements】

Fungal culture,Morphological observation of fungi, fungal staining (own specimen + teacher providing candida albicans), and analysis of bacterial colony count results

【main instruments and medicines】

Optical microscope

【experimental requirements】

aseptic operation

## Experiment 8 Title: The operation test (4 credit hours)

【teaching objectives and requirements】

complete gram staining procedures

【main instruments and medicines】

Optical microscope

【experimental requirements】

aseptic operation

# 5. Annual update of the experimental projects

The experiment was designed by colony counting experiment

## 6. The corresponding relationship of experimental teaching

| | 1.Practical Ability | 2.The ability to use knowledge to analyze phenomena | 3.Strengthen the ethical concept of experimental animal | 4.Cultivating clinical thinking ability |
|---|---|---|---|---|
| Experiment 1 | √ | √ | | √ |
| Experiment 2 | √ | √ | | √ |
| Experiment 3 | √ | √ | | √ |
| Experiment 4 | √ | √ | | √ |
| Experiment 5 | √ | √ | | √ |
| Experiment 6 | √ | √ | | √ |
| Experiment 7 | √ | √ | | √ |
| Experiment 8 | √ | √ | | √ |

## 7. Assessment and evaluation methods

**【Examination contents】**

The final result is a combination of attendance, experimental report, and experimental results (gram staining and Bacteria Streaking Isolation) and operation examination (aseptic technique).

**【Achievement evaluation】**

The proportion of each department is as follows: attendance (20%), experiment report (30%), experiment result (20%), operation examination (30%).

## 8. Textbooks and bibliography

**【Textbooks】**

Zhou yabin. Experimental study on medical immunology and pathogen biology (3rd edition). Beijing: science press, 2018

**【Bibliography】**

Hu xiaomei, rao xiancai. Experimental guide for medical microbiology. Beijing: science press, 2017