



Quality Assurance Unit



**Tanta University
Faculty of Medicine**

Department of Microbiology and Immunology

Course Specifications

**Microbiology and Immunology
Third Year**

2011-2012

3- Intended learning outcomes (ILOs):

a- knowledge and understanding:

- a1 Minimize general (bacterial, viral, fungal) morphology, physiology and genetics.
- a2 Recognize the principles of growing and cultivating microorganisms.
- a3 Identify the scientific basis of using antimicrobial agents, their mode of action, application and complications in vivo and in vitro.
- a4 Describe the host parasite relationship and microbial virulence and pathogenesis.
- a5 State (list) information of the physiology of the immune system, its structure, normal function, beneficial and harmful reactions.
- a6 Identify and Differentiate microorganisms of medical importance, their virulence, pathogenesis, clinical diseases they cause, diagnosis, treatment, prevention and control.
- a7 Discuss nosocomial infections, principles and methods of decontamination and infection prevention and control.
- a8 Define the clinical manifestations of systemic infections and different organisms causing them, and how to reach a diagnosis.
- a9 explain the basis of molecular biology

b- Intellectual skills

- b1 Classify microorganisms as a bacterium, virus or fungus according to standard taxonomy.
- b2 Distinguish different laboratory procedures necessary to approach diagnosis of the common infectious clinical conditions with prioritization of the most appropriate and most cost effective tests to be used.
- b3 Interpret results and reports of microbiological, serological, immunological and molecular tests.
- b4 Predict the appropriate antibiotics used in treatment of each disease.
- b5 Discuss the danger of handling and use of infectious agents on community.
- b6 Differentiate between the principles of sterilization and infection control procedures in laboratories and hospitals

c- Professional & practical skills

- c1 Perform Simple, Gram and Zeihl- Neelsen strains of bacteria and identify according to morphology and the characteristics of stained preparations.
- c2 Examine microscopic stained preparations of the most medically important bacteria.
- c3 Investigate culture media (with and without growth) and the different biochemical tests used to identify bacteria and diagnose infectious diseases.
- c4 Solve some common microbiologically related medical problems
- c5 Construct different methods of sterilization, disinfection and infection control.
- c6 Show antibiograms used for choice of proper antibiotics.
- c7 demonstrate and perform some antigen antibody reactions

d-General transferable skills

- d.1- Able to deal with information technology.
- d.2- Communicate effectively with all potential health care providers

d.3- Collaborate with his colleagues in a team work inside the lab, as well as solving problems.

4- Topics (Contents of the course)

| Topic | No. of hrs. | | | Tutorial sessions |
|--|-------------|--|-----------|-------------------|
| | Lectures | Practical and small group demonstrations | Total | |
| <u>I) General bacteriology</u> | <u>14</u> | <u>14</u> | <u>28</u> | <u>10</u> |
| <u>1. Introduction</u> | <u>1</u> | - | <u>1</u> | - |
| <u>2. Morphology and structure</u> | <u>2</u> | <u>2</u> | <u>4</u> | <u>2</u> |
| <u>3. Physiology and metabolism</u> | <u>2</u> | - | <u>2</u> | <u>2</u> |
| <u>4. General methods for identification of bacteria</u> | - | <u>6</u> | <u>6</u> | |
| <u>5. Microbial genetics</u> | <u>2</u> | - | <u>2</u> | <u>2</u> |
| <u>6. Sterilization</u> | <u>2</u> | <u>2</u> | <u>4</u> | <u>2</u> |
| <u>7. Chemotherapy</u> | <u>2</u> | <u>2</u> | <u>4</u> | <u>2</u> |
| <u>8. infection and resistance</u> | <u>1</u> | - | <u>1</u> | <u>1</u> |
| <u>REVISION</u> | <u>2</u> | <u>2</u> | <u>4</u> | - |
| <u>II) Immunology</u> | <u>18</u> | <u>8</u> | <u>26</u> | <u>20</u> |
| <u>1. Host parasite relationship</u> | <u>1</u> | - | <u>1</u> | - |
| <u>2. Innate immunity</u> | <u>1</u> | - | <u>1</u> | <u>2</u> |
| <u>3. cells of immune response</u> | <u>1</u> | - | <u>1</u> | <u>1</u> |
| <u>4. Antigens</u> | <u>1</u> | - | <u>1</u> | <u>2</u> |
| <u>5. Acquired immunity and cytokines</u> | <u>2</u> | - | <u>2</u> | <u>2</u> |
| <u>6. Humoral immune response</u> | <u>2</u> | - | <u>2</u> | <u>2</u> |
| <u>7. Complement system</u> | <u>1</u> | <u>2</u> | <u>3</u> | <u>1</u> |
| <u>8. Antigen - antibody reactions</u> | <u>2</u> | <u>4</u> | <u>6</u> | <u>2</u> |
| <u>9. Host defense against infection and cancer</u> | <u>1</u> | - | <u>1</u> | <u>2</u> |
| <u>10. Hypersensitivity</u> | <u>2</u> | - | <u>2</u> | <u>2</u> |
| <u>11. Tolerance, autoimmunity, Immunodeficiency</u> | <u>1</u> | - | <u>1</u> | <u>2</u> |
| <u>12. Transplantation and graft rejection</u> | <u>1</u> | - | <u>1</u> | <u>2</u> |
| <u>REVISION</u> | <u>2</u> | <u>2</u> | <u>4</u> | - |
| <u>III) Systemic bacteriology</u> | <u>33</u> | <u>26</u> | <u>59</u> | <u>29</u> |
| <u>1. Classification</u> | <u>1</u> | - | <u>1</u> | - |
| <u>2. Staphylococci</u> | <u>2</u> | <u>2</u> | <u>4</u> | <u>2</u> |
| <u>3. Streptococci & pneumococci</u> | <u>2</u> | <u>2</u> | <u>4</u> | <u>2</u> |
| <u>4. Nisseria</u> | <u>2</u> | <u>2</u> | <u>4</u> | <u>2</u> |
| <u>5. Bacillus group</u> | <u>1</u> | <u>2</u> | <u>3</u> | <u>1</u> |
| <u>6. Corynebacteria</u> | <u>2</u> | <u>2</u> | <u>4</u> | <u>1</u> |

| | | | | |
|---|----------|-----------|-----------|----------|
| <u>7. Mycobacterium group</u> | <u>2</u> | <u>2</u> | <u>4</u> | <u>2</u> |
| <u>8. Enterobacteriaceae & Pseudomonas</u> | <u>5</u> | <u>10</u> | <u>15</u> | <u>4</u> |
| <u>9. Vibrio & Campylobacter</u> | <u>1</u> | - | <u>1</u> | <u>2</u> |
| <u>10. Legionella, gardenella & bacteroids</u> | <u>1</u> | - | <u>1</u> | <u>1</u> |
| <u>11. Brucella</u> | <u>1</u> | - | <u>1</u> | <u>2</u> |
| <u>12. Yersinia, Haemophilus & Bordetella</u> | <u>2</u> | - | <u>2</u> | <u>2</u> |
| <u>13. Clostridium group</u> | <u>1</u> | <u>2</u> | <u>3</u> | <u>2</u> |
| <u>14. Spirochetes</u> | <u>2</u> | - | <u>2</u> | <u>2</u> |
| <u>15. Rickettsia</u> | <u>2</u> | - | <u>2</u> | <u>2</u> |
| <u>16. Actinomycetes, Chlamydia, Mycoplasma</u> | <u>3</u> | - | <u>3</u> | <u>2</u> |
| <u>REVISION</u> | <u>3</u> | <u>2</u> | <u>5</u> | - |
| <u>IV) General & Systemic Mycology</u> | <u>4</u> | - | <u>4</u> | - |
| <u>V) General & Systemic Virology</u> | <u>8</u> | - | <u>8</u> | - |
| <u>VI) Infection control & Nosocomial Infection</u> | <u>3</u> | <u>2</u> | <u>5</u> | <u>1</u> |
| <u>VII) Applied Microbiology</u> | <u>2</u> | - | <u>2</u> | - |
| <u>REVISION</u> | <u>8</u> | <u>10</u> | <u>18</u> | - |

5-Teaching and learning methods

- 5.1. Lectures: Large group plenary sessions including 4 lectures held weekly on Tuesday at 12 pm-1 pm, Wednesday at 2-3 pm and Thursday at 12 pm -2 pm and 2-4pm at lecture theaters throughout the academic year. Students are classified into 2 groups, each group receive 2 lectures/week (total of 3 hours/week) according to timed table. They set the scene for a topic, highlight important issues and direct the attention to different Immunological disorders and microbial diseases.
- 5.2. Practical classes: students are divided into twelve groups; each group has one practical class per week throughout the academic year at 10 am-12 pm from Sunday through Thursday and at 2 pm – 4 pm on Wednesday. Tutors explain the background and basic information of the different microbiological laboratory procedures and tests used then students are divided into small groups, 25 each to demonstrate them under supervision. Case study and problem solving discussion are also carried out.
- 5.3. Tutorial: For reviewing important issues and microbiological laboratory tests using data show and movies.

7-Student Assessment :

a) Methods used

1. Attendance criteria: to Students should attend not less than 75% of practical classes as an essential prerequisite to be legible for the final exams.
2. Written Examination and MCQs to assess a1-a9, b1-b6 and c4.
3. Oral examination to assess a1-a9, b1-b6 and d2.
4. Practical examination to assess b1-b6 and c1-c7

5. Semester work and log books to assess d1-d3.

b)- Assessment schedule

| Assessment | Week |
|---------------------------|--|
| 1-A Mid-year examination. | February. It includes: one hour written examination composed of 10 MCQs and 4 short essay-type questions. |
| 2- Final examination | The end of the academic year (May- June). It includes: <ul style="list-style-type: none"> • Written examination: A 3-hour written paper composed of case study/problem solving and short essay-type questions. • Oral examination: One oral examination station with 2 staff members (15-20 minutes: 4-5 questions). • Practical examination: -Ten spots include slides, culture media, biochemical reactions, serological tests, instruments, data show with short complete type questions as well as case studies. |
| 3- Semester work | Through out the academic year. It Includes: drawing of lab. Manual book, periodical examination and project presentation. |
| 4- Log book | Through out the academic year. |

c- Weighing of assessments

| Exam | Marks | % of Total |
|--------------------------------|--------------|-------------------|
| Mid term examination | 30 | 15% |
| Final term written examination | 100 | 50 % |
| Oral examination | 30 | 15% |
| Practical/laboratory work | 30 | 15 % |
| Semester work | 10 | 5 % |
| Total | 200 | 100% |

d) Attendance criteria:

1. Practical attendance: to Students should attend not less than 75% of practical classes as an essential prerequisite to be legible for the final exams.
2. Practical books: including lab. Manual and log book.

-E) Grading System

| Examination | Topic | Description | Marks |
|-------------------------|----------------------|--|--------------|
| Periodical Examinations | MCQ examinations | First half of the academic year 3 Quiz (MCQs) | 5 |
| Projects | Project presentation | Second half of the academic year. Students are classified into groups (10-15 each) and choose related | 5 |

| | | | |
|-------------------|--|---|-----|
| | | subjects then present them in front of staff members who evaluate them after discussion | |
| Mid term exam | Written examination | February. MCQs and Short assay questions in genral bacteriology and part of systemic bacteriology | 30 |
| Final Examination | Written (3-hours- one paper) | May-June. Short essay-type questions and case study/problem solving in general, and systemic bacteriology, mycology and virology | 100 |
| | Practical exam (20 minutes; 2 minute for each) | Ten spots include slides, culture media, biochemical reactions, serological tests, instruments with short complete type questions as well as one problem. | 30 |
| | Oral exam (15-20 minutes) | One oral examination station with 2 staff members and 4-5 questions. | 30 |

8- List of references

8.1 Course notes

MEDICAL MICROBIOLOGY & IMMUNOLOGY: Department theoretical books and practical manual (4 volumes) available for students to purchase from different bookshops at the faculty.

8.2 Text book

Jawetz, Melnick and Adelber's Medical microbiology

8.3 Recommended books

Mackie and McCartney practical medical microbiology – Koneman, Allen and Janda color atlas and text book of diagnostic microbiology.

8.4 Periodicals and web sites

- <http://www.asm.org/>
- <http://www.phages.org/>
- <http://www.microbeworld.org/>
- <http://www.microbelibrary.org/>
- <http://www.cdc.gov/hepatitis/index.htm>
- <http://pathmicro.med.sc.edu/book/welcome.htm>

9- Facilities Required for Teaching and Learning

Facilities used for teaching this course include:

Lecture halls

Laboratories (with sinks, instruments and microscopes)

Small group areas (rooms) equipped with computer assistance and data shows

Course coordinator

Name- Dr. Azza Mahmoud Hassan -signature....._Date.....

Name- Dr. Ibtesam Kamel. -signature....._Date.....

Head of department

Name Prof. Mohamed Ismaiel -signature..... Date.....

Intended learning outcomes of the course (A)

Academy / University: Tanta

Faculty: Medicine.:

Department: Microbiology & Immunology :

| | |
|--|-----------------------------|
| <input checked="" type="checkbox"/> The name of course | Microbiology and Immunology |
| Code of course | TMED.03:03 |

| Topics of the course | Week Study | Knowledge & Understanding | Intellectual Skills | Professional Skills | General transferable skills |
|---|-------------|---------------------------|----------------------|---------------------|-----------------------------|
| Course specs and introduction Morphology & structure Microscopes & morphology (lab.) | First week | a1 | b1 | c2 | d3 |
| Physiology & metabolism Infection & resistance Methods of identification (Gram staining) | Second week | a1, a4,a7 | b1,b2,b3,b5 | c1,c2 | d2,d3 |
| Sterilization Host parasite relationship Methods of identification (Z.N. staining) | Third week | a1, a4,a7 | b1,b2,b3,b5,b6 | c1,c2,c5 | d2,d3 |
| Chemotherapy Innate immunity Methods of identification (culture media) | Fourth week | a2,a3,a5 | b2,b3,b4,b5 | c3,c6 | d2,d3 |
| Microbial genetics Antigen Sterilization (lab.) | Fifth week | a1,a5,a9 | b6 | c5 | d3 |
| Acquired immunity & cytokines Revision of general bacteriology Antibiotic sensitivity tests | Sixth week | a5 a1-a5 a3 | b3 b1,b2,b6 b4 | c6 | d3 |

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|--|--------------------|-------------|----------------|--------------|-------|
| Humoral immune response Revision of general bacteriology practical revision | Seventh week | a5 a1-a5 | b3 b1,b2,b6 | c1-c3, c5,c6 | d2,d3 |
| Antigen-antibody reactions Cells of immune response Agglutination test (slide) | Eighth week | a5 | b2,b3 | c7 | d2,d3 |
| hypersensitivity Host defense against infection and cancer Agglutination test (tube) | Ninth week | a5 | b2,b3 | c7 | d2,d3 |
| Complement system Tolerance, autoimmunity, Immune deficiency Transplantation &graft rejection Complement fixation test | Tenth week | a5 | b2,b3 | c7 | d2,d3 |
| Revision of immunology Practical revision | Eleventh week | a5 | b2,b3 | c7 | d2,d3 |
| Classification Staphylococci Staphylococci (lab.) | Twelfth week | a6,a7,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |
| Streptococci & pneumococci Bacillus group Streptococci & pneumococci (lab.) | Thirteenth week | a6,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |
| Niesseria Vibrio & Campylobacter Niesseria (lab.) | Fourteenth week | a6,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |
| Corynebacteria Legionella, gardenella &bacteroids Diphtheria (lab.) | Fifteenth week | a6,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |
| Mycobacterium group | Sixteenth | a6,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |

Course Specifications: Microbiology and Immunology Third Year, 2011-2012

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|--|---------------------|----------|-------------|----------|-------|
| Brucella T.B (lab.) | week | | | | |
| Enterobacteriaceae & Pseudomonas Clostridium group Coliform bacilli (lab.) | Seventeenth week | a6,a7,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |
| Enterobacteriaceae & Pseudomonas Actinomycetes Salmonella (lab.) | Eighteenth week | a6,a7,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |
| Yersinia, Haemophilus & Bordetella Enterobacteriaceae & Pseudomonas Shigella (lab.) | Nineteenth week | a6,a7,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |
| Spirochetes Chlamydia Proteus (lab.) | Twenty week | a6,a7,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |
| Rickettsia Mycoplasma Pseudomonas (lab.) | Twenty-one week | a6,a7,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |
| Revision Clostridium (lab.) | Twenty-two week | a6,a7,a8 | b1,b2,b4 | c2,c3,c4 | d1,d3 |
| General & Systemic Mycology (1) Applied Microbiology (1) Anthrax (lab.) | Twenty-three | a6,a8 | b1,b2,b4 | c2,c3,c4 | d3 |
| General & Systemic Mycology (2) Applied Microbiology (2) Practical revision | Twenty-four | a6,a7,a8 | b1,b2,b4 | c1 – c7 | d3 |
| General Virology Infection control & Nosocomial Infection (lab.) | Twenty-five | a6,a8 | b1,b2,b4,b5 | c2,c3,c4 | d2,d3 |

Course Specifications: Microbiology and Immunology Third Year, 2011-2012

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|--|----------------------|----------|----------|---------|-------|
| Systemic virology (1) Practical revision | Twenty-six | a6,a8 | b1,b2,b4 | c1 – c7 | d3 |
| Systemic virology (2) Infection control & Nosocomial Infection (1) Practical revision | Twenty-seven | a6,a7,a8 | b1,b2,b4 | c1 – c7 | d2,d3 |
| Infection control & Nosocomial Infection (2) revision Practical revision | Twenty-eight week | a1-a9 | b1-b6 | c1-c7 | d1-d3 |
| revision Practical revision | Twenty-nine week | a1-a9 | b1-b6 | c1-c7 | d1-d3 |
| revision Practical revision | Thirty week | a1-a9 | b1-b6 | c1-c7 | d1-d3 |

Course coordinator

Name- Dr. Azza Mahmoud Hassan -signature....._Date.....

Name- Dr. Ibtesam Kamel. -signature....._Date.....

Head of department

Name Mohamed Ismaiel -signature..... Date.....

