

Peer Revision

| Reviewers | University | Date of Revision |
|-------------------------|-------------------|-------------------------|
| - Prof. Dawlat Salem | Cairo | 10/12/2011 |
| - Prof. Ahmad K. Mansur | Mansura | 28/11/2011 |

Program Specification of Medical Doctorate Degree of Medical Microbiology and Immunology

Sohag University

Faculty of Medicine

A. Basic Information

1. Program title: MD. Degree in Medical Microbiology & Immunology
2. Program type: Single
3. Faculty: Faculty of Medicine
4. Department: Medical microbiology & immunology.
5. Coordinator: Dr/ Nahed Fathallah Fahmy
6. Assistant Co-ordinator: assistant Lecturer: Noha Saber Shafik
7. External evaluator: Prof. Osama Shamseldin Raslan
8. Last date of program specifications approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018.

B. Professional Information:

1. Program aims:

The aim of this program is to provide the postgraduate student with the advanced medical knowledge and skills essential for the mastery of practice of specialty and necessary to provide further training and practice in the field of Medical Microbiology & Immunology through providing:

1. Recent scientific knowledge essential for the mastery of practice of Medical Microbiology & Immunology according to the international standards.
2. Skills necessary for preparing for proper diagnosis and management of patient problems in the field of Medical Microbiology & Immunology, skills for conducting and supervising researches on Medical Microbiology & Immunology.
3. Ethical principles related to the practice in this specialty.
4. Active participation in community needs assessment and problems identification.
5. Maintenance of learning abilities necessary for continuous medical education.
6. Upgrading research interest and abilities.

2. Attributes of the postgraduate student:

1. Efficient in carrying out the basics and methodologies of scientific research.
2. The continuous working to add new knowledge in the field of Medical Microbiology and immunology.
3. Applying the analytical course and critical appraisal of the knowledge in his specialty and related fields.
4. Merging the microbiological and immunological knowledge with the other related knowledge with conclusion and developing the relationships in between them.
5. Showing a deep awareness with the ongoing problems, theories, and advanced sciences in the specialty of Medical Microbiology and Immunology.



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3. Ethical principles related to the practice in this specialty.
4. Active participation in community needs assessment and problems identification.
5. Maintenance of learning abilities necessary for continuous medical education.
6. Upgrading research interest and abilities.

2. Attributes of the postgraduate student:

1. Efficient in carrying out the basics and methodologies of scientific research.
2. The continuous working to add new knowledge in the field of Medical Microbiology and immunology.
3. Applying the analytical course and critical appraisal of the knowledge in his specialty and related fields.
4. Merging the microbiological and immunological knowledge with the other related knowledge with conclusion and developing the relationships in between them.
5. Showing a deep awareness with the ongoing problems, theories, and advanced sciences in the specialty of Medical Microbiology and Immunology.

6. Determination of the professional problems in the specialty of Medical Microbiology and Immunology and creating solutions for them.
7. Efficient in carrying out the professional skills in his specialty.
8. Using advanced suitable technologies which serves his practice.
9. Efficient communication and leadership of team work in his specialty.
10. Decision making through the available information.
11. Using the available resources efficiently and working to find new resources.
12. Awareness with his role in the development of the society and preserve environment.
13. Behaving in a way which reflects his credibility, accountability, and responsibility.
14. Keeping continuous self development and transfer his experiences and knowledge to others.

3. Intended learning outcomes (ILOs):

a) Knowledge & Understanding

By the end of the program the student must be able to:

- a1. Mention the microbes affecting human beings all over the world including bacteria, viruses and fungi, with pertinent details on how they affect and interact with both humans and the environment.
- a2. Mention the geographical distribution and impact of each microbe in health and disease, and extrapolate the significance of geography on disease and vice versa.
- a3. List the pathology, clinical symptoms and complications of each microbe, and be able to correlate all data to patient's benefit.
- a4. List the laboratory tests needed for diagnosis of each case, and work closely with physicians to maximize benefit to the patient by constantly updating physicians on new and developing laboratory tests.
- a5. List the antibiotics and instructions used for treating each case, especially as regards drug complications and interactions, with care taken to avoid unnecessary over exposure to antibiotics by close consultation with treating physicians, and constantly updating local antibiograms.
- a6. List advanced infection control measures at all levels of their hierarchy and be able to plan, implement and maintain all aspects of an infection control program.
- a7. Describe the immune system, and the role it plays in health and disease, with emphasis on the increasing role of immunomodulating therapies for the management of a wide variety of disorders.
- a8. Describe bacterial genetics and its implications with human genetics, especially the techniques used to attain recent discoveries.
- a9. Illustrate the role of molecular genetics and molecular biology applications in diagnosis of a wide variety of medical disorders.
- a10. Describe the role of the environment in affecting the immune system, and propagating infections whether singularly or in concert.
- a11. Mention the principles and fundamentals of ethics and legal aspects of professional practice in the field of microbiology & immunology.
- a12. List the principles and fundamentals of quality.
- a13. Describe the recent advances in biostatistics and computer.
- a14. mention the principles, methods and steps of conducting scientific researches
- a15. Mention the ethical aspects of conducting scientific researches in the field of microbiology
- a16. Describe the principles of evidence based medicine.

b) Intellectual skills:

By the end of the course the student must have the ability to:

- b1. Integrate the structure and function of different microbes from all aspects whether morphologic, biochemical, molecular or otherwise.
 - b2. Analyze and explain the pathogenesis laboratory diagnosis and management of each group of infectants (bacteria, viruses and fungi) , and performing risk assessment on whether these infectants can interplay together , and the possible effect(s) on patients .
 - b3. Analyze and compare the role of the immune system in health and disease especially diseases where the immune system is implicated in the pathogenesis, or is considered a possible treatment modality.
 - b4. Apply the role of infection control practices in limiting nosocomial infections and propagation of sound health standards, with strong emphasis on propagation and possibly enforcing infection control standards.
 - b5. Analyze given data, cross reference with other relevant data, extrapolate logical findings and use it in problem solving.
 - b6. Apply self learning skills in solving problems.
 - b7. Apply analytical skills in anticipating risks.
 - b8. Apply available skills to innovate and initiate researches of high caliber .
 - b9. Formulate a scientific policy which is flexible and evolving to accommodate rapid advances in the field of Medical Microbiology & Immunology.
 - b10. Criticize published papers, whether constructive or otherwise, while ensuring total neutrality in judging any scientific publication.
 - b11. Formulate scientific papers in the area of microbiology.
- c) Professional and practical skills**

By the end of the course the student must have the ability to:

- c1. Teach various microbes by using a variety of methods, including assessing clinical picture, performing or ordering laboratory tests, and using deductive reasoning with all available data to communicate the best possible laboratory data to treating physicians
- c2. Identify each microbe by name to facilitate treatment, while being fully aware of the recent updates to local antibiograms.
- c3. Identify immunological functions or dysfunctions on a clinical level, and know what tests to order for each condition.
- c4. Perform infection control practices and applications at all levels from planning to implementation.
- c5. Design all manner of routine laboratory tests available in the department lab whether basic or advanced, and know how to maximize patient benefit through sound scientific practice.
- c6. Perform a wide variety of immunological tests.
- c7. Teach various molecular biology tests as is available.
- c8. Initiate and propagate infection control practices.
- c9. Attend, participate and help in organizing scientific conferences, meetings, workshops and thesis discussion that update relevant recent topics in molecular biology, advanced immunology, emerging and re-emerging diseases, be actively involved in and lead discussions on sound scientific base.
- c10. Write and evaluate medical laboratory reports
- c11. Evaluate and develop methods and tools in the field
- c12. Apply modern technological methods for laboratory work, and constantly updating and revising new methods.
- c13. Plan the development of professional practice and development of others.
- c14. Design new methods and tools for professional practice
- c15. Perform recent advanced technological methods in collection, analysis and interpretation of data.

- c16. Describe the basic and modern professional skills in conducting researches in the area of microbiology.
- c17. Design new methods, tools and ways of conducting researches.

d) General and Transferable skills

By the end of the course the student must have the ability to:

- d1. Skillfully practice communication skills.
- d2. Use the computer to access microbiology/immunology web sites.
- d3. Collect scientific data from the computer.
- d4. Use clear parameters in assessment of others
- d5. Use appropriate computer program packages.
- d6. Collect data from medical centers and patients
- d7. Use the sources of biomedical information to remain current with advances in knowledge and practice (self learning).
- d8. Work in groups, as a leader or as a colleague.
- d9. Use of different sources for information and knowledge.
- d10. Work coherently and successfully as a part of a team and team's leadership in conducting researches.

4. Academic Standards:

Sohag faculty of medicine adopted the general National Academic Reference Standards (NARS) provided by the national authority for quality assurance and accreditation of education (naqaae) for postgraduate programs. This was approved by the Faculty Council decree N0.6854, in its session N0.177 Dated: 18/5/2009. Based on these NARS; Academic Reference Standards (ARS) were suggested for this program. These ARS were revised by external evaluator, and approved by Faculty Council decree N0.7528, in its session N0.191, dated: 15/3/2010. The adoption of NARS and the suggested ARS were approved by University council degree No 587, in its session No.60. Dated 26-12-2011.

5. Curriculum structure and contents:

5.a- Program duration: 7 semesters (3.5 years).

5.b- Program structure:

5. b.i- Number of hours per week:

| Subject | Hours/week | | |
|------------------------------|------------|-----------|----------|
| | Lectures | Practical | Clinical |
| First Part: | | | |
| Minors: | | | |
| • Bio Statistics & Computer | 2 | 1 | |
| • Research Methodology | 2 | 1 | |
| • Advanced Molecular Biology | 8 | | |
| Second Part: | | | |
| • Microbiology & Immunology | 7 | 12.5 | ---- |

| code | Item | No | % | |
|------|--------------------|------------|----|-----|
| b.i | Total credit hours | Compulsory | 90 | 100 |
| | | Elective | 0 | 0 |
| | | Optional | 0 | 0 |

| | | | |
|--------|-----------------------------------------------------------|----|-------|
| b.iii | credit hours of basic sciences courses | 8 | 8.88 |
| b.iv | credit hours of courses of social sciences and humanities | 0 | 0 |
| b.v | credit hours of specialized courses: | 53 | 58.88 |
| b.vi | credit hours of other course | 6 | 6.66 |
| b.vii | Practical/Field Training | 8 | 8.88 |
| b.viii | Program Levels (in credit-hours system): | | |
| | Level 1: 1 st part | 14 | 15.56 |
| | Level 2: 2 nd Part | 53 | 58.88 |
| | Level 3: Thesis | 15 | 16.7 |

6. **Program Courses** * 4 courses are compulsory.

6.1- Level of program:

Semester...1.....

First part:

A. Compulsory:

| Course title | Total No. of credit hours | No. of hours / week | | Program ILO Covered |
|------------------------------|---------------------------|---------------------|-----------|---------------------------------------------|
| | | Lect. | Practical | |
| Bio Statistics & Computer | 3 | 2 | 1 | a13-b5-b8 –c15-d5-d9 |
| Minors: Research Methodology | .3 | 2 | 1 | a14, a15, a16,b5-b8-b10-,b11,c16-c17-d9-d10 |
| Advanced Molecular Biology | 8 | 8 | ---- | a9-b5-b6-b7-c6-c8-d3 |

Second Part:

| | | | | |
|---------------------------|----|---|------|------------------------------------------|
| Microbiology & Immunology | 53 | 7 | 12.5 | a1:a12-b1:b7-b9-c1:c6-c8:c14-d1:d4,d6:d8 |
|---------------------------|----|---|------|------------------------------------------|

7. Program Admission Requirements

I- General Requirements.

- Candidate should have either MBBch degree from any Egyptian Faculty of Medicine or Equivalent Degree from Medical Schools abroad approved by the ministry of high Education.
- Candidate should know how to speak & write English well
- Candidate should have computer skills.
- Follow postgraduate bylaw Regulatory rules of Sohag Faculty of Medicine approved by the ministerial decree No. (44), dated 6/1/2010.

II- Specific Requirements

- Master degree in Medical Microbiology& Immunology with at least "Good Rank".

8. Regulations for Progression and Program Completion

Duration of program is 90 credit hours (≥ 7 semesters ≥ 3.5 years), starting from registration till acceptance of the thesis; divided to:

First Part: (14 Credit hours ≥ 6 months ≥ 1 semester):

- Program-related basic science, Research Methodology, Ethics & medical reports, Biostatistics and computer.
- At least six months after registration should pass before the student can ask for examination in the 1st part.
- Two sets of exams: 1st in October — 2nd in April after fulfillment of the credit hours.
- At least 60% of the written exam and 60% of the total oral and practical/clinical is needed to pass in each course.
- For the student to pass the first part exam, a score of at least 60% (Level D) in each course is needed.
- Those who fail in one course need to re-exam it only.
- GPA of ≥ 1.3 is needed to pass this level (semester).

Second Part: (53 Credit hours ≥ 24 months= 4 semesters):

- Program related specialized science of Medical Microbiology& Immunology courses. At least 24 months after passing the 1st part should pass before the student can ask for examination in the 2nd part.
- Fulfillment of the requirements in each course as described in the template and registered in the log book (8 Credit hours; with obtaining $\geq 75\%$ of its mark) is a prerequisite for candidates to be assessed and undertake part 1 and part 2 examinations; the credit hours of the logbook are calculated as following:
 - Each Cr. Hr.= 60 working Hrs.
 - Logbook= 8 Cr. Hr. X 60 working Hrs = 480 Working Hrs.
 - Collection of working Hrs. is as following:

| Activity | | Hrs |
|------------------------------------|-----------------------------------------|------------------|
| Grand rounds | اجتماع علمي موسع | ٦ |
| Training courses | دورات تدريبية | 12/ day |
| Conference attendance | حضور مؤتمرات علمية داخلي خارجة | ١٢/day 18/day |
| Thesis discussion | حضور مناقشات رسائل | ٦ |
| Workshops | حضور ورش عمل | ١٢/day |
| Journal club | ندوة الدوريات الحديثة | ٦ |
| Seminars | لقاء علمي موسع | ٦ |
| Morbidity and Mortality conference | ندوة تحليل المخاطر المرضية أو الوفاة | ٦ |
| Self education program | برنامج التعليم الذاتي | ٦ |

- Two sets of exams: 1st in October - 2nd in April.
- At least 60% of the written exam is needed to be admitted to the oral and practical exams.
- 4 times of oral and practical exams are allowed before the student has to re-attend the written exam.

Third Part (Thesis) (15 Credit hours =24-48 months=4-8 semester):

1. Documentation of the subject should not be delayed for > 1.5 years after registration.

2. Could start after registration and should be completed, defended and accepted after passing the 2nd part final examination, after passing of at least 24 months after documentation of the subject of the thesis and after publishing of at least one paper from the thesis in a specialized peer-reviewed journal.
3. Accepting the thesis is enough to pass this part.

9. Methods of student assessments:

| Method of assessment | weight | The assessed ILOs |
|------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------|
| 1-Research assignment | | - General transferable skills, intellectual skills |
| 2-Written Exams: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15% | 50% | - Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills |
| 3-OSPE | 50% | -Practical skills, intellectual skills, general transferable skills |
| 4-Structured Oral Exams | | - Knowledge, Intellectual skills, General transferable skills |

Assessment schedule:

Part I:

- Biostatistics & Computer: Written Exam (2 hours) + Structured oral Exam+ OSPE
- Research Methodology: Written Exam (2 hours) + structured oral Exam+ OSPE
- Advanced Molecular Biology: Written Exam (3 hour) + structured oral Exam.

Part II:

- Medical Microbiology & Immunology: Two Written Exams (3 hours for each)
+ Structured oral Exam + OSPE

10. Evaluation of program:

| Evaluator | Tool | Sample |
|------------------------------------------------|---------------|--------|
| 1- Senior students | Questionnaire | 2 |
| 2- Alumni | Questionnaire | 4 |
| 3- Stakeholders (Employers) | Questionnaire | 10 |
| 4-External Evaluator(s) (External Examiner(s)) | Report | 1 |
| 5- Other | | |

Course Specifications of Biostatistics and computer for MD degree in Medical Microbiology and Immunology

Sohag University

Faculty of Medicine

1. Program on which the course is given: MD degree in Medical Microbiology & Immunology
2. Major and Minor element of program: Minor
3. Department offering the course: Community Medicine and public Health Dep.
4. Department offering the program: Medical Microbiology & Immunology Dep.
5. Academic year/level: 1st part
6. Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

A. Basic Information

Title: Applied Biostatistics (with computer use) In MD Degree in Medical Microbiology & Immunology

Code: COM 0515-300.

| Title | Lecture | Practical | Total | credit |
|----------------------------|---------|-----------|-------|--------|
| Biostatistics and computer | 30 | 30 | 60 | 3 |

B. Professional Information

1. Overall Aims of Course

To use precisely biostatistics and computer programs.

2. Intended Learning Outcomes of Courses (ILOs)

a) **Knowledge and understanding:**

By the end of the course, the student is expected to be able to:

- a1. Describe the recent advance in data collection and analysis.
- a2. Define the sources of data and methods of collection
- a3. Describe how to Summarize data, construct tables and graphs
- a4. Mention how to Calculate measures of central tendency and measures of dispersion
- a5. Mention how to Interpret selected tests of significance and the inferences obtained from such tests
- a6. Identify factor analysis and discrimination analysis.
- a7. Describe different programs of analysis of data and statistical packages
- a8. Illustrate selected tests of significance for parametric and non parametric inferences

b) **Intellectual Skills**

By the end of the course, the student is expected to be allowed to:

- b1. Apply available Biostatistics skills to innovate and initiate researches of high caliber
- b2. Analyze given data, cross reference with other relevant data, extrapolate logical findings and use it in problem solving.

c) **Professional and Practical Skills:**

By the end of the course, the student is expected to practice the following:

- c1. Perform recent advanced technological methods in collection, analysis and interpretation of data.

d) **General and Transferable Skills:**

By the end of the course, the student is expected to be able to:

- d1. Use appropriate computer program packages.
 d2. Use of different sources for information and knowledge about biostatistics.

3. Contents

| Topic | No. of hours | Lecture | Tutorial/ Practical |
|--------------------------------------------------------------------|--------------|-----------|---------------------|
| Recent advances in collection, analysis and interpretation of data | 6 | 3 | 3 |
| -Details of Tests of significance: Proportion test | 6 | 3 | 3 |
| Chi-square test | 6 | 3 | 3 |
| Student T test | 6 | 3 | 3 |
| Paired T test | 6 | 3 | 3 |
| -Correlation | 4 | 2 | 2 |
| -Regression | 6 | 3 | 3 |
| -ANOVA test | 4 | 2 | 2 |
| -Discrimination analysis | 6 | 3 | 3 |
| Factor analysis | 4 | 2 | 2 |
| - parametric and non parametric tests | 6 | 3 | 3 |
| Total | 60 | 30 | 30 |
| Total Credit hours | 3 | 2 | 1 |

4. Teaching and Learning Methods

- 4.1- Lectures
 4.2- Practical sessions
 4.3- Computer search assignments
 4.4- Computer applications

5. Student Assessment Methods

| Method of assessment | The assessed ILOs |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 5.1- Observation of attendance and absenteeism. | - General transferable skills, intellectual skills |
| 5.2-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15% | - Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills, |
| 5.3-Structured Oral Exam | - Knowledge, Intellectual skills, General transferable skills |
| 5.4 Computer search assignment | -General transferable skills, intellectual skills |

Assessment Schedule

| | | |
|-------------------|--------------------------------------------------------------|----------|
| Assessment 1..... | Final written exam | Week: 24 |
| Assessment 2..... | Structured Oral Exam | Week: 24 |
| Assessment 3 | Attendance and absenteeism throughout the course | |
| Assessment 4 | Computer search assignment performance throughout the course | |

Weighting of Assessments

| | | |
|--------------------------------|------------|----------|
| Final-term written examination | 50 | % |
| Final Structured Oral Exam | 50 | % |
| Total | 100 | % |

Formative only assessments: attendance and absenteeism and Computer search assignments performance.

6. List of References

6.1- Essential Books (Text Books)

1-Maxy-Rosenau Public health and preventive medicine, 2008.,Robert Wallace, publisher McGraw-Hill Medical; 15 edition.

6.2- Recommended Books

1- Dimensions of Community Based projects in Health Care, 2018. Arxer, Steven L., Murphy, John W.; 1st edition.

2- Parks Text Book of Preventive & Social Medicine. 2017., K. Park. BanarsidasBhanot Publishers; 23 edition.

3- Clinical Epidemiology: The Essentials, 2013, Robert F., Suzanne W. Fletcher, Grant S., publisher Lippincott Williams & Wilkins; 5 edition.

6.3- Periodicals, Web Sites, ...etc

1-American Journal of Epidemiology

2-British Journal of Epidemiology and Community Health

3- WWW. CDC and WHO sites

7. Facilities Required for Teaching and Learning:

1. ADEQUATE INFRASTRUCTURE: including teaching places (teaching class, teaching halls, teaching laboratory), comfortable desks, good source of aeration, bathrooms, good illumination, and safety & security tools.
2. TEACHING TOOLS: including screens, computers including cd (rw), data shows, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, colour and laser printers.
3. COMPUTER PROGRAM: for designing and evaluating MCQs

Course Coordinator: Dr/ Foad Metry Atya

Head of Department: Prof/ Ahmed Fathy Hammed

Date: 18/12/2011, **Revised:**1/9/2012, **Revised:**1/12/2013, **Revised:**1/12/2018

Course Specifications of Research methodology for MD degree in Medical Microbiology & Immunology

Sohag University

Faculty of Medicine

1. Program on which the course is given: MD degree in Medical Microbiology & Immunology
2. Major and Minor element of program: Minor
3. Department offering the course: Community Medicine and public Health Dep.
4. Department offering the program: Medical Microbiology & Immunology Dep.
5. Academic year/level: 1st part
6. Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

A. Basic Information

Title: Course Specifications of Research methodology in MD degree in Medical Microbiology & Immunology

Code: COM 0515-300.

| Title | Lecture | Practical | Total | credit |
|----------------------|---------|-----------|-------|--------|
| Research methodology | 30 | 30 | 60 | 3 |

B. Professional Information

1. Overall Aims of Course

1. To influence the students to adopt an analytical thinking for evidence based medicine
2. To use precisely the research methodology in researches

2. Intended Learning Outcomes of Courses (ILOs)

a) **Knowledge and understanding:**

By the end of the course, the student is expected to be able to:

- a1. Mention the principles and fundamentals of ethics and legal aspects of professional practice in the field Research Methodology
- a2. Explain the strategies and design of researches
- a3. Describe the sampling methods
- a4. Describe the study design, uses, and limitations
- a5. Explain evidence based Medicine
- a6. Define the screening tests pertinent to selected diseases and the at-risk approach in the application of screening tests
- a7. Build a model explaining the research methods and analysis of determinants of human diseases and health problem.
- a8. List how to Calculate different samples sizes
- a9. List different types of bias, confounding and chance

b) **Intellectual Skills**

By the end of the course, the student is expected to be allowed to:

- b1. Analyze given Research data, cross reference with other relevant data, extrapolate logical findings and use it in problem solving.
- b2. Apply skills of Research methodology to innovate and initiate researches of high caliber by Select and use appropriate research methods and Apply appropriate research strategies .

- b3. Perform criticism on published papers methodology, whether constructive or otherwise, while ensuring total neutrality in judging any scientific publication.
- b4. Formulate scientific papers in the area of microbiology.

c) Professional and Practical Skills:

By the end of the course, the student is expected to practice the following:

- c1. Mention the basic and modern professional skills in conducting researches in the area of microbiology.
- c2. Design new methods, tools and ways of conducting researches.

d) General and Transferable Skills:

By the end of the course, the student is expected to be able to:

- d1. Use of different sources for information and knowledge to serve research.
- d2. Work coherently and successfully as a part of a team and team's leadership in conducting researches and field studies.

3. Contents

| Topic | No. of hours | Lecture | Tutorial/ Practical |
|--------------------------------------------------------------------------------|--------------|-----------|---------------------|
| Details of epidemiological studies (case control, cohort and cross sectional) | 8 | 4 | 4 |
| Clinical trials, Quasi experimental study | 6 | 3 | 3 |
| Bias and errors | 6 | 3 | 3 |
| Setting a hypothesis | 6 | 3 | 3 |
| Recent advances in screening | 6 | 3 | 3 |
| a) Evidence – based Medicine: | | | |
| Concept and examples | 4 | 2 | 2 |
| Applicability | 4 | 2 | 2 |
| Scientific writing: | | | |
| A protocol | 4 | 2 | 2 |
| A curriculum | 4 | 2 | 2 |
| Setting an objective | 2 | 1 | 1 |
| - Critical thinking | 2 | 1 | 1 |
| Formulation of papers | 8 | 4 | 4 |
| Total | 60 | 30 | 30 |
| Credit hours | 3 | 2 | 2 |

4. Teaching and Learning Methods

- 4.1- Lectures.
- 4.2- Computer search assignments

5. Student Assessment Methods

| Method of assessment | The assessed ILOs |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
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Assessment Schedule

| | | |
|--------------|--------------------------------------------------------------|----------|
| Assessment 1 | Final written exam | Week: 24 |
| Assessment 2 | Final Structured Oral Exam | Week: 24 |
| Assessment 3 | Attendance and absenteeism throughout the course | |
| Assessment 4 | Computer search assignment performance throughout the course | |

Weighting of Assessments

| | | |
|--------------------------------|-----|---|
| Final-term written examination | 50 | % |
| Structured Oral Exam | 50 | % |
| Total | 100 | % |

Any formative only assessments Attendance and absenteeism throughout the course

Computer search assignment performance throughout the course

6. List of References

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7. Facilities Required for Teaching and Learning:

1-ADEQUATE INFRASTRUCTURE: including teaching places (teaching class, teaching halls, teaching laboratory), comfortable desks, good source of aeration, bathrooms, good illumination, and safety & security tools.

2- TEACHING TOOLS: including screens, computers including cd (rw), data shows, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, colour and laser printers.

Course Coordinator: Dr/ Foad Metry Atya

Head of Department: Prof/ Ahmed Fathy Hammed

Date: 18/12/2011, **Revised:**1/9/2012, **Revised:**1/12/2013, **Revised:**1/12/2018

Course Specifications of Advanced Molecular Biology for MD degree in Medical Microbiology & Immunology

Sohag University

Faculty of Medicine

1. Program on which the course is given: MD degree in Medical Microbiology & Immunology.
2. Major and Minor element of program: Minor
3. Department offering the course: Medical Microbiology & Immunology Dep.
4. Department offering the program: Medical Microbiology & Immunology Dep.
5. Academic year/level: 1st part
6. Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

A. Basic Information

Title: Course Specifications of Advanced Molecular Biology in MD Medical Microbiology & Immunology

Code: MIC 0515-300.

| Title | Lecture | Total | credit |
|----------------------------|---------|-------|--------|
| Advanced Molecular Biology | 120 | 120 | 8 |

B. Professional Information

1. Overall Aims of Course

By the end of the course the post graduate students should be able to have the professional knowledge of the advanced molecular biology.

2. Intended Learning Outcomes of Courses (ILOs)

a) **Knowledge and understanding:**

By the end of the course, the student is expected to be able to:

- a1. Recognize the role of molecular genetics and molecular biology applications in diagnosis of a wide variety of medical disorders.

b) **Intellectual Skills**

By the end of the course, the student is expected to be able to:

- b1. Analyze given molecular biology data, cross reference with other relevant data, extrapolate logical findings and use it in problem solving.
- b2. Apply self learning skills in solving molecular biology problems
- b3. Apply molecular biology skills in anticipating risks

c) **Professional and Practical Skills:**

By the end of the course, the student is expected to practice the following:

- c1. Perform various molecular biology tests as is available
- c2. Attend, participate and help in organizing scientific conferences, meetings, workshops and thesis discussion that update relevant recent topics in molecular biology , be actively involved in and lead discussions on sound scientific base.

d) **General and Transferable Skills:**

By the end of the course, the student is expected to be able to:

- d1. Collect scientific data related to Advanced Molecular Biology from the computer.

3. Contents:-

| Topics | No. of hours | Lecture |
|--------------------------------------------------------------------------------------------------------------------|---------------------|----------------|
| 1. Introduction | 2 | 2 |
| 2. Identification of genetic material-DNA molecular structure-RNA molecular structure, types | 6 | 6 |
| 3. DNA replication: models-enzymes-difference between eukaryotics ,prokaryotics | 6 | 6 |
| 4. transcription | 6 | 6 |
| 5. Genetic code | 6 | 6 |
| 6. Protein synthesis | 6 | 6 |
| 7. Regulation of gene action | 6 | 6 |
| Molecular biology techniques | | |
| 1. Nucleic acid amplification techniques PCR: Non PCR:NASBA-SMART-LCR,... | 24 | 24 |
| 2. Blotting technique -Southern -Northern -western | 24 | 24 |
| 3. Nucleic acid hybridization techniques : In-situ hybridization (ISH)-Fluorescence In-situ hybridization(FISH) | 24 | 24 |
| 4. Genetic engineering(tools-isolation and use of restriction enzymes | 2 | 2 |
| 5. Sequencing of genes | 2 | 2 |
| 6. Synthesis of genes | 2 | 2 |
| 7. DNA finger printing | 2 | 2 |
| 8. DNA microarray | 2 | 2 |
| Total | 120 | 120 |
| Credit hours | 8 | 8 |

4. Teaching and Learning Methods

4.1- Lectures

4.2- Practical sessions

5. Student Assessment Methods

| Method of assessment | The assessed ILOs |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 5.1- Observation of attendance and absenteeism. | - General transferable skills, intellectual skills |
| 5.2-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15% | - Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills, |
| 5.3-Structured Oral Exam | - Knowledge, Intellectual skills, General transferable skills |
| 5.4-OSPE | -Practical skills, intellectual skills |

Assessment Schedule

- 1- Assessment 1: written examination week 24
- 2- Assessment 2: Structured Oral Exam week 24
- 3-Assessment 3... OSPE week24
- 4- Assessment of attendance & absenteeism throughout the course

Weighting of Assessments

| | |
|--------------------------------|------|
| Final-term written examination | 0.0% |
| Structured Oral Exam | 30% |
| OSPE | 20% |
| Total | 100% |

Formative only Assessment: simple research assignment, attendance and absenteeism

6. List of References

6.1- Essential Books (Text Books)

Prof. Abba Elmeshad immunology, systemic bacteriology, practical books.2015
Lippincott`s immunology ,systemic bacteriology
Jawetz Medical Microbiology.
Roitt Essential Immunology.
David Clark Molecular Biology, 2018
Alberts Molecular Biology

6.2- Recommended Books

-A coloured Atlas of Microbiology.
-Topley and Wilson, Microbiology

6.3- Periodicals, Web Sites, ... etc

Journal of Clinical immunology.

<http://mic.sgmjournals.org/>

American journal of infection control
Microbiology and Immunology on line
www.sciencedirect.com

7. Facilities Required for Teaching and Learning:

1-ADEQUATE INFRASTRUCTURE: including teaching places (teaching class, teaching halls, teaching laboratory), comfortable desks, good source of aeration, bathrooms, good illumination, and safety & security tools.

2- TEACHING TOOLS: including screens, computers including cd (rw), data shows, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, colour and laser printers.

3- COMPUTER PROGRAM: for designing and evaluating MCQs

Course Coordinator: Dr/ Nahed Fathallah Fahmy

Head of Department: Prof/ Abeer Sh. Mohamed

Date: 18/12/2011, **Revised:**1/9/2012, **Revised:**1/12/2013, **Revised:**1/12/2018

Course Specifications of Medical Microbiology & Immunology for MD degree in Medical Microbiology & Immunology

Sohag University

Faculty of Medicine

1. Program on which the course is given: MD degree in Medical Microbiology & Immunology.
2. Major and Minor element of program: Major
3. Department offering the course: Medical Microbiology & Immunology Dep.
4. Department offering the program: Medical Microbiology & Immunology Dep.
5. Academic year/level: 2nd part.
6. Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

A. Basic Information

Title: Course Specifications of Medical Microbiology & Immunology in MD degree in Medical Microbiology & Immunology

Code: MIC 0515-300.

| Title | Lecture | Practical | Total | credit |
|---------------------------|---------|-----------|-------|--------|
| Microbiology & Immunology | 420 | 750 | 1170 | 53 |

B. Professional Information

1. Overall Aims of Course

Gain advanced knowledge of the Medical Microbiology and Immunology

2. Intended Learning Outcomes of Courses (ILOs)

a) **Knowledge and understanding:**

By the end of the course, the student is expected to be able to:

- a1. Enumerate advanced knowledge of the microbes affecting human beings all over the world including bacteria, viruses and fungi, with pertinent details on how they affect and interact with both humans and the environment.
- a2. Mention the geographical distribution and impact of each microbe in health and disease, and extrapolate the significance of geography on disease and vice versa.
- a3. Recognize the pathology, clinical symptoms and complications of each microbe, and be able to correlate all data to patient's benefit.
- a4. List the laboratory tests needed for diagnosis of each case, and work closely with physicians to maximize benefit to the patient by constantly updating physicians on new and developing laboratory tests
- a5. List the antibiotics and instructions used for treating each case, especially as regards drug complications and interactions, with care taken to avoid unnecessary over exposure to antibiotics by close consultation with treating physicians , and constantly updating local antibiograms.
- a6. Enumerate advanced infection control measures at all levels of their hierarchy and be able to plan, implement and maintain all aspects of an infection control program
- a7. Have advanced knowledge about the immune system, and the role it plays in health and disease, with emphasis on the increasing role of immunomodulating therapies for the management of a wide variety of disorders.
- a8. Have advanced knowledge about bacterial genetics and its implications with human genetics, especially the techniques used to attain recent discoveries .

- a9. Recognize the role of molecular genetics and molecular biology applications in diagnosis of a wide variety of medical disorders.
- a10. Acquire sufficient knowledge about the environment, and its role in affecting the immune system , and propagating infections whether singularly or in concert.
- a11. Mention the principles and fundamentals of ethics and legal aspects of professional practice in the field of microbiology & immunology.
- a12. Mention the principles and fundamentals of quality .

b) Intellectual Skills

By the end of the course, the student is expected to be allowed to:

- b1. Analyze and explain the structure and function of different microbes from all aspects whether morphologic, biochemical, molecular or otherwise.
- b2. Analyze and explain the pathogenesis laboratory diagnosis and management of each group of infectants (bacteria, viruses and fungi) , and performing risk assessment on whether these infectants can interplay together , and the possible effect(s) on patients .
- b3. Analyze and explain the role of the immune system in health and disease especially diseases where the immune system is implicated in the pathogenesis , or is considered a possible treatment modality
- b4. Apply the role of infection control practices in limiting nosocomial infections and propagation of sound health standards, with strong emphasis on propagation and possibly enforcing infection control standards
- b5. Analyze given data, cross reference with other relevant data, extrapolate logical findings and use it in microbiology & immunology problem solving.
- b6. Apply self learning skills in Microbiology & Immunology solving problems
- b7. Apply analytical skills in Microbiology & Immunology anticipating risks
- b8. Formulate a scientific policy which is flexible and evolving to accommodate rapid advances in the field of microbiology & immunology

c) Professional and Practical Skills:

By the end of the course, the student is expected to practice the following:

- c1. Identify various microbes by using a variety of methods, including assessing clinical picture, performing or ordering laboratory tests, and using deductive reasoning with all available data to communicate the best possible laboratory data to treating physicians
- c2. Identify each microbe by name to facilitate treatment, while being fully aware of the recent updates to local antibiograms.
- c3. Identify immunological functions or dysfunctions on a clinical level, and know what tests to order for each condition
- c4. Identify infection control practices and applications at all levels from planning to implementation
- c5. Perform all manner of routine laboratory tests available in the department lab whether basic or advanced, and know how to maximize patient benefit through sound scientific practice.
- c6. Perform a wide variety of immunological tests.
- c7. Initiate and propagate infection control practices
- c8. Attend, participate and help in organizing scientific conferences, meetings, workshops and thesis discussion that update relevant recent topics in , advanced immunology, emerging and re-emerging diseases, be actively involved in and lead discussions on sound scientific base.
- c9. Write and evaluate medical laboratory reports
- c10. Evaluate and develop methods and tools in the field
- c11. Apply modern technological methods for laboratory work, and constantly updating and revising new methods.

- c12. Plan the development of professional practice and development of others
 c13. Design new methods and tools for professional practice

d) General and Transferable Skills:

By the end of the course, the student is expected to be able to:

- d1. Skillfully practice communication skills .
 d2. Use the computer to access microbiology/immunology web sites.
 d3. Collect scientific data related to Microbiology & Immunology from the computer.
 d4. Use clear parameters in assessment of others
 d5. Collect data from medical centers and patients
 d6. Use the sources of biomedical information to remain current with advances in knowledge and practice (self learning).
 d7. Work in groups, as a leader or as a colleague.

3. Contents

| <u>Topics</u> | No. Of hours | Lectures | Practical |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------|------------------|
| Applied Medical Microbiology and Infection Control | | | |
| 1.1- Blood stream infections | 30 | 10 | 20 |
| 1.2-Upper respiratory tract infections | 30 | 10 | 20 |
| 1.3- Other infections of oral cavity and neck | 30 | 10 | 20 |
| 1.4- Lower respiratory tract infections | 30 | 10 | 20 |
| 1.5- Meningitis and other infections of CNS | 30 | 10 | 20 |
| 1.6-Infections of eyes, ears and sinuses | 30 | 10 | 20 |
| 1.7- Urinary tract infections | 30 | 10 | 20 |
| 1.8- Genital tract infections | 30 | 10 | 20 |
| 1.9- Gastrointestinal tract infections | 30 | 10 | 20 |
| 1.10-Skin, soft tissue and wound infections | 30 | 10 | 20 |
| 1.11-Normal sterile body fluids, Bone and bone marrow and solid tissues | 30 | 10 | 20 |
| 2. Water Associated Diseases | 30 | 10 | 20 |
| 3. Food Associated Diseases | 30 | 10 | 20 |
| 4. Zoonotic Diseases | 30 | 10 | 20 |
| 5. Occupational hazard related diseases | 30 | 10 | 20 |
| 6. Practical Virology | | | |
| 6.1-Introductions to bacteriophage, the viruses of bacteria whose study initiated modern molecular biology | 13 | 13 | --- |
| 6.2- Virological Methods A variety of assay formats that measure virus presence directly (plaque assay and bioassay) or through a key property such as receptor binding (red blood cell agglutination) | 13 | 13 | --- |
| 6.3-Methods used to classify and quantitate viruses | 13 | 13 | --- |
| 6.4-Virological techniques including virus isolation, amplification and quantitation. | 13 | 13 | ---- |
| 6.5- Tissue culture techniques & propagation of viruses & egg inoculation routes (Tissue culture & how to grow viruses in cell culture,) • Multi-nucleated giant cell | 13 | 13 | ---- |

| | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|------|
| <ul style="list-style-type: none"> • Intranuclear inclusion bodies • Intracytoplasmic inclusion bodies • Cytopathic effects of HSV-1 & enteroviruses | | | |
| 6.6- a range of practical virology techniques as: <ul style="list-style-type: none"> • CFT • Hemagglutination inhibition • EIA & IFA • Neutralization test | 30 | 30 | ---- |
| 6.7-Electron Microscopy Electromicrographs of DNA & RNA viruses | 30 | 30 | --- |
| <u>7. Immunological practices field training</u> <u>7.1- Serologic Assays</u> <ul style="list-style-type: none"> • Handling sera and obtaining fluid from different compartments • Acute-phase proteins and inflammation • Complement in health and disease • Immunoglobulin titers and immunoglobulin subtypes • Rheumatoid factors • Autoantibodies • SLE-associated tests • Tumor markers • Multiplexed serum assays | 30 | 10 | 20 |
| <u>7.2- Cellular Enumeration and Phenotyping</u> <ul style="list-style-type: none"> • Handling and storage of cells and sera: practical • Phenotypic and functional measurements on circulating immune cells and their subsets • Natural killer cells • Peripheral blood naive and memory B cells • Dendritic cells • Monocytes and macrophages • Tumor cells • Regulatory T. cells • Intracellular cytokine assays | 30 | 10 | 20 |
| <u>7.3- Cellular Function and Physiology</u> <ul style="list-style-type: none"> • Cytolytic assays • Mixed leukocyte reactions • Antigen/mitogen-stimulated lymphocyte proliferation • Monitoring cell death • Cytokine enzyme linked immunosorbent spot (ELISPOT) assay • Testing natural killer cells | 30 | 10 | 20 |
| <u>7.4-Other Assays for :</u> <ul style="list-style-type: none"> • Hematologic disorders • Autoimmunity | 30 | 10 | 20 |

| | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|------------|
| <ul style="list-style-type: none"> • Transplantation • Immunodeficiencies • Asthma and allergy | | | |
| 8. Medical microbiology laboratory management | | | |
| 8.1-Medical microbiology laboratory physical design | 20 | 4 | 16 |
| 8.2-Medical microbiology laboratory Management | 20 | 4 | 16 |
| 8.3-Medical microbiology laboratory Organization | 20 | 4 | 16 |
| 8.4-Quality in medical microbiology laboratory | 20 | 4 | 16 |
| 8.5-Sentinel laboratory response to bioterrorism | 20 | 4 | 16 |
| 9. Applied Infection prevention and Control | 20 | 4 | 16 |
| 9.1- Infection Prevention and Control of Device Related Infections | 20 | 4 | 16 |
| <ul style="list-style-type: none"> • Ventilator associated pneumonia (VAP) • Intra vascular catheter related Infections (IVCRIs) • Surgical site infection (SSI) • Catheter related urinary tract infections (CRUTIs) • Cardiac catheterization and electrophysiology • Safe injection • Body Piercing, Tattoos, and Electrolysis | 20 | 4 | 16 |
| 9.2- Unit specific Infection Prevention and Control Measures: | | | |
| <ul style="list-style-type: none"> • IC measures in Operating rooms (OR) • IC measures in Intensive care units (ICU) • IC measures in Neonatal ICU • IC measures in dentistry unit • IC measures in hemodialysis unit • IC measures in endoscopy unit | 20 | 4 | 16 |
| | 20 | 4 | 16 |
| | 20 | 4 | 16 |
| | 20 | 4 | 16 |
| | 20 | 4 | 16 |
| | 20 | 4 | 16 |
| 9.3- Surveillance of hospital acquired infections | 32 | 11 | 21 |
| 9.4- Outbreak investigations | 43 | 14 | 29 |
| TOTAL | 1170 | 420 | 750 |
| Credit hours | 53 | 28 | 25 |

4. Teaching and Learning Methods

4.1- Lectures

4.2- Practical sessions

5. Student Assessment Methods

| Method of assessment | The assessed ILOs |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 5.1- Observation of attendance and absenteeism. | - General transferable skills, intellectual skills |
| 5.2-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15% | - Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills, |
| 5.3-Structured Oral Exam | - Knowledge, Intellectual skills, General transferable skills |
| 5.4-OSPE | -Practical skills, intellectual skills |

Assessment Schedule

| | |
|----------------------------------------|---------|
| 1-Assessment 1... Written exam | week 96 |
| 2-Assessment 2... Structured Oral Exam | week96 |
| 3-Assessment 3... OSPE exam | week96 |

Weighting of Assessments

| | |
|---------------------------------------------------------------------------|---------------|
| Final-term written examination | separate exam |
| Passing in the written exam is a condition to attend the following exams: | |
| Structured Oral Exam | 50 % |
| OSPE Examination | 50 % |
| Total | 100 % |

formative only assessments :simple research assignment ,logbook ,attendance and absenteeism

6. List of References

6.1- Essential Books (Text Books)

Prof. Abla Elmehad immunology, systemic bacteriology, practical books.2015

Lippincott`s immunology ,systemic bacteriology

Jawetz Medical Microbiology.

Roitt Essential Immunology.

Alberts Molecular Biology

Abul Abbas Basic Immunology, 2015.

6.2- Recommended Books

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-Topley and Wilson, Microbiology.

Cellular and Molecular Immunology, 2017

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Date: 18/12/2011, Revised:1/9/2012, Revised:1/12/2013, Revised:1/12/2018