Academic Reference Standards (ARS)
for
Diploma in
(Microbiology and Immunology)

Microbiology and Immunology Dept.

ARS

Academic Year: 2021/2022

رئيس القسم
أ.د/ السيد الشربيني حبيب

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Academic Reference Standards (ARS)

Diploma in Microbiology and Immunology

Approved by the department Council on December 8th 2021

The Academic Reference Standards (ARS) for Diploma in (Microbiology and Immunology) regarding attributes and capabilities of the graduates were based essentially on the General Academic Reference Standards of graduate studies published by the National Authority for Quality Assurance and Accreditation of Education (NAQAAE, 2009).

Attributes of the graduate:

The graduates of the Diploma Degree of Microbiology and Immunology should be capable of:

1- Applying the acquired knowledge in the field of microbiology during professional practice.

2- Identifying and solving problems in the field of microbiology.

3- Mastering the professional skills in the field of microbiology and the use of appropriate technological means in professional practice.

4- Communication, leadership and working in team.

5- Making decisions according to the available information.

6- Employing the available resources efficiently.

7- Promoting his active role in professional and community organizations and keeping the environment.

8- Dealing with complex professional issues, in order to make informed, fair, and valid judgments on the basis of sound principles and values

9- Demonstrating the importance of self-development and engagement of continuous learning.

Academic Standards

2.1. Knowledge and Understanding

By the end of this program, graduate will be able to:

2.1.1 Identify the theories and fundamentals of Microbiology and other related fields.

2.1.2 Understand the moral and legal principles for professional practices in microbiology.

2.1.3 Describe quality control principles of immunological products and quality assessment of pharmaceutical products.

2.1.4 Outline the influence of microbiology branches on the environment.

2.2. Intellectual Skills

By the end of this program, graduate will be able to:

2.2.1 Analyze and interpret problems in the field of microbiology in a specific and suitable form.

2.2.2 Develop significant solutions for professional problems.

2.2.3 Analyze research topics related to microbiology.

2.2.4 Recognize possible hazards during work and how to deal with them effectively.

2.2.5 Construct professional decisions in different issues according to the available information.

2.3. Professional and Practical Skills

By the end of this program, graduate will be able to:

2.3.1. Apply the acquired qualified skills in the field of microbiology and immunology.

2.3.2. Write professional reports.

2.4. General and transferable skills:

By the end of this program, graduate will be able to:

2.4.1. Communicate effectively by various methods.

2.4.2. Utilize effectively information technology in professional practice development.

2.4.3. Perform self-assessment, continuous learning and identifying personal educational needs.

2.4.4. Use different resources to acquire knowledge and information.

2.4.5. Demonstrate effective self-management in terms of time, planning, teamwork and leadership.

2.4.6. Plan for self and continuous learning.

Program: Diploma in (Microbiology & Immunology)

Microbiology & Immunology Department

Program Specification

Academic Year: *2021/2022*

رئيس القسم
أ.د/ السيد الشربينى حبيب

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A-Basic Information

1	**Faculty**	**Pharmacy**
2	**Program Title:**	**Diploma in (Microbiology& Immunology)**
3	**Program Type:**	**Mono disciplinary**
4	**Department (s):**	**Department of Microbiology& Immunology**
5	**Final award:**	**Diploma in Microbiology& Immunology**
6	**Coordinator:**	**Prof. Dr. EL-Sayed E Habib**
7	**External Evaluator(s):**	--
8	**Date of Program Specification Approval:**	***Department council: 8/12/2021***

B-Professional Information

1-Program Aims

Upon successful completion of the program, graduates should demonstrate comprehensive knowledge, clear understanding and outstanding skills in pharmaceutical sciences, Microbiology and Immunology and should be capable of:

1.1 Mastering of advanced knowledge, professional research skills, attitudes and values in the field of Microbiology and Immunology

1.2 Mastering of all traditional and new techniques used in the field of Microbiology and Immunology.

1.3 Applying the scientific thinking approaches and problem-based learning in subjects relevant to Microbiology and Immunology.

1.4 Applying the basics and methodologies of scientific research and manipulating its various tools in the field of Microbiology and Immunology to keep the environment

1.5 Utilizing different available information resources relevant to Microbiology and Immunology.

1.6 Dealing with complex professional issues.

1.7 Practicing self-learning in the field of Microbiology.

1.8 Getting maximum use of time to achieve goals.

1.9 Attaining communication skills, research ethics, decision-making, and team-working.

2-Intended Learning Outcomes (ILOs)

A. Knowledge and Understanding:

By the end of this program the graduate should be able to:

A1 Express properly the theories and principles of microbiology and their related subjects including biotechnology, diagnostic microbiology, molecular biology, pharmaceutical microbiology and immunology.
A2 Understand the moral and legal principles for professional practices in microbiology.
A3 Illustrate quality control principles of immunological products and other pharmaceutical products.
A4 Identify the effect of diagnosis and treatment of different infections on the environment
A5 Recognize the effect of biotechnology on the environment
A6 Describe the principles of quality assurance of different antimicrobial agents
A7 Outline the effect of bacteriology, mycology and virology on the environment
A8 Identify the impact of control of microorganisms by different methods on the environment
A9 Describe a basic understanding of quality assurance in the diagnostic laboratory and the range of diagnostic tests available and the circumstances in which they are used.

B. Intellectual Skills

By the end of this program the graduate should be able to:

B1	Analyze and interpret data obtained from microbiology research and utilize them in a specific and suitable form.
B2	Analyze clinical and laboratory problems effectively and correctly interpret and explain results simply and effectively to clinicians and patients.
B3	Take professional decisions in selection of the most methods for diagnosis and treatment of different infections
B4	Identify possible hazards on environment and how to deal with them effectively.
B5	Take professional decisions in different issues during research.
B6	Evaluate research topics related to microbiology research and utilize them in a specific and suitable form.

C. Professional and Practical Skills

By the end of this program the graduate should be able to:

C1	Use efficiently the acquired skills in the field of microbiology and immunology to improve the professional practice.
C2	Write professional reports in the field of microbiology.

D. General and Transferable Skills

By the end of this program the graduate should be able to:

D1	Communicate clearly by verbal and written means.
D2	Use technological means in a better professional practice.
D3	Practice self- assessment and learning needed for continuous professional development.
D4	Utilize different available information resources relevant to microbiology and immunology.
D5	Work effectively in a team and offer expertise and advice to others
D6	Develop creativity and time management abilities.
D7	Practice self-assessment for continuous learning.

3-Academic Reference Standards (ARS):

Approved by both the Department and Faculty Councils
Department council Approval Date: 8/12/2021,
Faculty council Approval Date:

3a- Academic References Standards:

3b-Comparison of provision to External References

Achievement of academic reference standards via program Intended Learning Outcomes.

ILOs	ARS	Program
1. **Knowledge and Understanding**	**1.1**	A1, A9
	1.2	A2
	1.3	A3, A6
2. **Intellectual Skills**	**2.1**	B1
	2.2	B2, B3
	2.3	B6
	2.4	B4
3. **Professional and Practical Skills**	**3.1**	C1
	3.2	C2
4. **General and Transferable Skills**	**4.1**	D1
	4.2	D2
	4.3	D3
	4.4	D4
	4.5	D5, D6

4-Curriculum Structure and Contents

4A. Program duration:

a- The candidate gains his/her Microbiology and immunology diploma degree after 24 credit hours of study (22 credit hours of courses and 2 credit hours for scientific essay).

b- The candidate is required to write scientific essay (2 credit hours) in a topic assigned by the academic supervisor, endorsed by the department council, the committee of graduate studies & research and the faculty council in the field of Microbiology and Immunology.

4B. Program structure:

a. The program consists of 24 credit hours of study divided over two semesters. A graduation project is included with 2 credit hours.
b. All courses possess the code number [PMD-100], According to Faculty By-Law.
c. A scientific graduation project of 2 credit hours represents a main component of the program. It is achieved in a subject assigned by the academic supervisor, endorsed by the department council, the committee of graduate studies & research and the faculty council.

4C. Program Components

1- Achievement of Program Intended Learning Outcomes by its components

Course	C.H/ week	Program ILOs (by No.)			
		K.U*	IS**	P.P.S***	G.T.S****
First Semester *(11 C.H.)*					
General Bacteriology *(PMD-101)*	**3**	A1, A2, A7	B1, B4, B5, B6	C1, C2	D1, D2, D3, D4, D5, D6, D7
General Mycology and Virology *(PMD-102)*	**3**	A1, A2, A7	B1, B4, B5, B6	C1, C2	D1, D2, D3, D4, D5, D6, D7
General Immunology *(PMD-104)*	**3**	A1, A2, A3	B1, B5, B6	C1, C2	D1, D2, D3, D4, D5, D6, D7
Antimicrobial Agents *(PMD-107)*	**2**	A1, A2, A4, A6	B1, B3, B5, B6	C1, C2	D1, D2, D3, D4, D5, D6, D7
Total (courses)	**11**				
Second Semester *(13 C.H.)*					
Biotechnology *(PMD-105)*	**3**	A1, A2, A5	B1, B4, B5, B6	C1, C2	D1, D2, D3, D4, D5, D6, D7
Diagnostic Microbiology *PMD-106)*	**3**	A1, A2, A4, A9	B1, B2, B3, B5, B6	C1, C2	D1, D2, D3, D4, D5, D6, D7

Microbiological Quality Control and Assurance *(PMD-103)*	**3**	A1, A2, A3, A6, A8	B1, B4, B5, B6	C1, C2	D1, D2, D3, D4, D5, D6, D7
Advanced Microbiological Laboratory Techniques PMD-109) (Elective)	**2(E)**	A1, A2, A9	B1, B2, B3, B5, B6	C1, C2	D1, D2, D3, D4, D5, D6, D7
Environmental Microbiology *(PMD-108)* (Elective)	**2(E)**	A1, A2, A5, A7, A8	B1, B4, B5, B6	C1, C2	D1, D2, D3, D4, D5, D6, D7
Graduation Project	**2**	A2	B1, B6	C2	D1, D3, D4
Total (courses)	**13**				
Total	**24**				

* ***K**nowledge and **U**nderstanding*
** ***I**ntellectual **S**kills*
*** ***P**rofessional and **P**ractical **S**kills*
**** ***G**eneral and **T**ransferable **S**kills*

		A1	A2	A3	A4	A5	A6	A7	A8	A9	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	D4	D5	D6	D7
PMD-101	General Bacteriology	√	√					√			√			√	√	√	√	√	√	√	√	√	√	√	√
PMD-102	General Mycology and Virology	√	√					√			√			√	√	√	√	√	√	√	√	√	√	√	√
PMD-104	General Immunology	√	√	√							√				√	√	√	√	√	√	√	√	√	√	√
PMD-107	Antimicrobial Agents	√	√		√		√				√		√			√	√	√	√	√	√	√	√	√	√
PMD-105	Biotechnology	√	√			√					√			√	√	√	√	√	√	√	√	√	√	√	√
PMD-106	Diagnostic Microbiology	√	√		√					√	√	√	√		√	√	√	√	√	√	√	√	√	√	√
PMD-103	Microbiological Quality Control and Assurance	√	√	√			√		√		√			√	√	√	√	√	√	√	√	√	√	√	√
PMD-109	Advanced Microbiological Laboratory Techniques (E)	√	√							√	√	√	√		√	√	√	√	√	√	√	√	√	√	√
PMD-108	Environmental Microbiology (E)	√	√			√		√	√		√			√	√	√	√	√	√	√	√	√	√	√	√

* ***K**nowledge and **U**nderstanding*
** ***I**ntellectual **S**kills*
*** ***P**rofessional and **P**ractical **S**kills*
**** ***G**eneral and **T**ransferable **S**kills*
E ***E**lective course*

6- Student Assessment Methods

6.1- Written exam	To assess Knowledge and Understanding and Intellectual Skills
6.2- Oral exam	To assess Knowledge and Understanding, Intellectual Skills and General and transferable Skills
6-3- Practical exam	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and Transferable Skills
6-4- Graduation Project (Written exam)	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and Transferable Skills
6.5- Graduation Project (Presentation and discussion)	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and Transferable Skills

7- Program Admission Requirements

7.1- The candidate should hold a bachelor degree in Pharmacy from any Faculty of Pharmacy in Egypt, Arab or Foreign countries recognized by the Supreme Council of Universities with minimum general grade of "**Good**". It is possible to enroll foreign students with general grade "**Good**" according to the rules determined by the Supreme Council of Universities

7.2- The candidate should be available for study at least two days per week throughout the duration of study.

7.3- The candidate should follow postgraduate rules of by-law (**2014**) and its modified by-law **(2017)** of Faculty of Pharmacy-Mansoura University.

8- Regulations for progression and program completion

8.1- The study period is one year of two semesters in addition to the Summer semester according to schedules determined by the faculty council.

8.2- The student has to pass the assigned courses included the graduation project for complete fulfilment of the diploma degree.

8.3- The faculty council should cancel the student enrollment if he does not gain the diploma degree in 3 years.

8.4- The candidate should follow postgraduate rules of by-law (**2014**) and its modified by-law **(2017)** of Faculty of Pharmacy-Mansoura University.

9- Facilities Required for Education and Research:

9.1- Suitable halls for lectures containing computers, internet and data show.

9.2- Library and digital library supplied by recent scientific books and journals.

9.3- Laboratories with enough chemicals, apparatus and advanced instruments.

9.4- Access to research engines for scientific periodicals in the field of Microbiology& Immunology.

9.5- Sufficient number of staff members, demonstrators and technicians.

10- Graduation project

A graduation project should be prepared by the student for complete fulfillment of the Diploma certificate.

11- Evaluation of program

Evaluator	Method	Sample
Internal evaluator	Program evaluation Courses evaluation	Program report Courses report
External evaluator	Program evaluation Courses evaluation	Program report Courses report
Stakeholders	Questionnaires	To be Attached
Postgraduates	Questionnaires	To be Attached
Self-evaluation	Matrices	To be Attached
Supervisor and defense committee of graduation project	Evaluation Sheet	Evaluation sheet of staff members of committee

Program Coordinator: Prof. Dr. El-sayed El sherbiny Habib
Head of Department: Prof. Dr. El-sayed El sherbiny Habib
Signature:

Annex 1
Attach course specifications.

Dept. of Microbiology & Immunology	Course Specification	Microbiology & Immunology Diploma

Microbiology & Immunology Diploma

Course Specification

Academic year: 2021/2022

توصيف مقرر المضادات الميكروبية **Antimicrobial Agents**	البرنامج دبلوم الميكروبيولوجيا و المناعة
منسق المقرر د. هبه شحته عبدالله سعيد	رئيس القسم ا. د. السيد الشربينى حبيب

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Microbiology & Immunology
Department supervising the course	Microbiology & Immunology
Program on which the course is given	Microbiology & Immunology Diploma Program
Academic Level	Postgraduate
Academic year	2021/2022 - First semester
Date of course specification approval	10/11/2021

A. Basic Information :Course data :

Course Title	Antimicrobial agents
Course Code	PMD-103
Prerequisite	------
Teaching Hours: Lecture	2 عدد الساعات الزمنية
Practical:	2 عدد الساعات الزمنية
Total Credit Hours	3

B. Professional Information

1- Overall Aims of Course:

After completion of the course, the graduate student will understand the general characteristics of antimicrobial agents including Antibacterial, Antifungal and Antiviral drugs, understand their mechanisms of action, side effects and the mechanisms of development of antimicrobial resistance, evaluate the activity of antimicrobial agents and their combinations, suggest the appropriate treatment for different microbial infections.

2- Intended Learning Outcomes (ILOs)

2.1. *Knowledge and Understanding*

After completion of the course, graduates will be able to

(a1, a7)	a1	Understand the general characteristics of antimicrobial agents
(a1, a2 a7)	a2	Understand the mechanisms of action, side effects of antimicrobial agents
(a1, a2)	a3	Understand the mechanisms of development of antimicrobial resistance

2.2. Intellectual Skills

After completion of the course, graduates will be able to

(b1, b4, b5, b6)	b1	Develop a greater awareness for the consequences of ingesting prescription medicines and exposure to non-therapeutic compounds and risk from environmental and biological threats to public safety
(b1, b5, b6)	b2	Utilize legal and ethical guidelines to ensure the correct and safe supply of medical products to the general public.
(b1, b5, b6)	b3	Apply the pharmacotherapeutic principles in the proper selection and use of drugs for treatment and control of various microbial infections

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

(c1, c2)	c1	evaluate the activity of different antimicrobial agents and apply biological methods for quality control (QC) and assay of raw materials as well as pharmaceutical preparations.
(c1)	c2	evaluate and assess the combined effect of different antimicrobial agents

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

(d1, d3, d4, d6)	d1	Work effectively in team and to solve scientific problems
(d2, d3, d4, d7)	d2	Able to use official internet sites to get updated information
(d3, d5, d7)	d3	Work effectively in team and to solve scientific problems

3. Course Contents

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1	Introduction to Antimicrobial agents, basis of selective toxicity. Classification of antibacterial agents.	2	2
2	Antibacterials: Drugs acting on bacterial cell Wall, their mechanism of action, side effects, and mechanisms of resistance.	2	2
3	Antibacterials: Drugs inhibiting bacterial protein synthesis, their mechanism of action, side effects, and mechanisms of resistance.	2	2
4	Antibacterials: Drugs inhibiting bacterial nucleic acid synthesis, their mechanism of action, side effects, and mechanisms of resistance.	2	2
5	Treatment of pulmonary tuberculosis, their mechanism of action, side effects, and mechanisms of resistance.	2	2
6	Evaluation of Antimicrobial Agents: Antibiotic sensitivity testing (Laboratory, automated and molecular methods), Assay of Antimicrobial agents.	2	2

7	Antimicrobial Combinations: reasons, types of interaction), evaluation of the combined effect of antimicrobial agents (Checkerboard, Killing curves, E-test, ...).	2	2
8	Antifungal Drugs, their mechanism of action (anti-mitotic, nucleic acid inhibitors, drugs acting on fungal cell wall and on plasma membrane), their side effects, and mechanisms of resistance.	2	2
9	Antiviral Drugs: their mechanism of action (Inhibitors of adsorption and penetration, nucleic acid synthesis, protein synthesis, and viral release inhibitors), their side effects, and mechanisms of resistance.	4	4
10			
Total: 10 weeks		**20**	**20**

4- Matrix of knowledge and skills of the course(contents versus ILOsof the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
1	Introduction to and Classification of Antimicrobial agents.	A1, A2, A3	B1, B2, B3	C1, C2	D1, D2, D3
2	Antibacterials: Drugs acting on bacterial cell Wall				
3	Antibacterials: Drugs inhibiting bacterial protein synthesis	A1, A2, A3	B1, B2, B3	C1, C2	D1, D2, D3
4	Antibacterials: Drugs inhibiting bacterial nucleic acid synthesis				
5	Treatment of pulmonary tuberculosis	A1, A2, A3	B1, B2, B3	C1, C2	D1, D2, D3
6	Evaluation of Antimicrobial Agents				
7	Antimicrobial Combinations and their evaluation				
8	Antifungal Drugs				
9	Antiviral Drugs	A1, A2, A3	B1, B2, B3	C1, C2	D1, D2, D3
10					

** Knowledge and Understanding* ***Intellectual Skills***Professional and Practical Skills*
*****General and Transferable Skills*

5- Teaching and Learning Methods:

5.1	Lectures (using white board and data show).
5.2	Seminar / Workshop
5.3	Practical Training / Laboratory

5.4	Case study
5.5	Role play
5.6	Self Learning

6- Student Assessment:

	Assessment Methods		Assessment Schedule	Weighing of Assessments
Assessment 1	**Written Exam (Final)**	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills		70 %
Assessment 2	**Tutorial / or Practical** assignments **and Semester work**	Assignments prepared by students and sent to the supervisor electronically for evaluation. To assess professional skills Practical skills are assessed through practical exams		20 %
Assessment 3	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills		10 %
				100 %

7- List of References

	Reference	Type
1.	Lippincott's Illustrated Reviews of Microbiology, 3rd Edition, 2013	Text book
2.	Hugo and Russell's Pharmaceutical Microbiology, 8th Edition, Blackwell, 2011	Text book
3.	Prescott, Harley and Klein's Microbiology, seventh edition, 2008	Text book
4.	Antibiotics and Antimicrobial Resistance Genes in the Environment, edited by Muhammad Zaffar Hashmi, 2019	Text book
5.	https://www.usp.org/	Internet Sites

8- Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
- Laboratory facilities	Microscopes, equipment, tools

- Video conference programs	Microsoft teams

9. Signature

Course Coordinator	Head of Department	Date
Dr. **Heba Shehta Abdallah Said**	**Prof Dr.** **El Sayed El Sherbiny Habib**	**10/11/2021**

Dept. of Microbiology and Immunology	Course Specification	Microbiology & Immunology Diploma

Microbiology & Immunology Diploma

Course Specification

Academic year: 2021/2022

توصيف مقرر **المناعة العامة** **General Immunology**	**البرنامج** **دبلوم الميكروبيولوجيا و المناعة**
منسق المقرر **ا.د/ هانى إبراهيم قناوى**	**رئيس القسم** **أ. د/ السيد الشربينى حبيب**

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Microbiology and Immunology
Department supervising the course	Microbiology and Immunology
Program on which the course is given	Microbiology & Immunology Diploma
Academic Level	Postgraduate
Academic year	2021/2022 - First semester
Date of course specification approval	10/11/2021

A.Basic Information: Course data:

Course Title	General Immunology
Course Code	PMD-104
Prerequisite	--
Teaching Hours: Lecture	2
Practical:	1
Total Credit Hours	3

B. Professional Information

1- Overall Aims of Course:

1.1 Introduce the basic structural and functional aspects of the immune system.
1.2 Identify the role of both arms of immunity in health and diseases.
1.3 Apply different immunological techniques used in research and diagnosis.

2- Intended Learning Outcomes (ILOs)

2.1. *Knowledge and Understanding*

After completion of the course, graduates will be able to

Program	Course ILOs No.	Course ILOs

ILOs No.		
A1	a1	Express properly the theories and principles of immunology.
A2	a2	Recognize the structure and functions of both innate an adaptive immunity.
A4	a3	Appreciate the role of immune system in body protection, homeostasis and tissue regeneration.
A1	a4	Differentiate between the innate and adaptive immune responses.

2.2. Intellectual Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
B1	b1	Predict the immune responses following infections.
B2	b2	Analyze and interpret data obtained from immunology research and utilize them in a specific and suitable form.
B3	b3	Take professional decisions in different issues during research.
B4	b4	Evaluate research topics related to immunology research and utilize them in a specific and suitable form.

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
C1	c1	Use efficiently the acquired skills in the field of immunology to improve the professional practice.
C2	c2	Advice on vaccine use professionally.
C3	c3	Write professional reports in the field of immunology.
C4	c4	Interpret results of different immunological tests properly.
C5	c5	Apply different immunochemical tests in research and immune diagnosis.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
D1	d1	Practice self-assessment and learning needed for continuous professional development.
D2	d2	Use the trusted scientific websites for updates professionally.
D3	d3	Develop creativity, problem-solving and time management abilities.
D4	d4	Work in teams efficiently

3. Course Contents

Week No.	Lecture Topics	Hours
1	Introduction to the immune system	2
2	Innate immunity- Physical, chemical and biological barriers, inflammation, phagocytosis	2
3	Innate immunity- Complement	2
4	Innate immunity- Antigen presentation	2
5	Innate like lymphocytes (Self and team-based learning)	2
6	Adaptive immunity	2
7	T cells development, activation and differentiation	2
8	B cells development, activation and differentiation	2
9	Vaccinology	2
10	Monoclonal antibodies	2
11	Immunochemical tests	2
Total: 11 weeks		**22**

Week No.	Practical Topics	Hours
1	Lab safety and handling	2
2	ELISA (full exp.)	2
3	CRP and ASO	2
4	ESR	2
5	Pregnancy and blood grouping	2
6	SDS-PAGE	2
7	Western blot	2
8	Precipitin test	2
Total: 8 weeks		**16**

4- Teaching and Learning Methods:

4.1	Computer aided learning: a. Lectures using whiteboard or data show, power Point presentations b. Lectures uploaded to the Google drive of the program
4.2	Self-learning
4.3	Class Activity: Group discussion or Tutorial

5- Student Assessment:

	Assessment Methods		Assessment Schedule	Weighing of Assessments
Assessment 1	**Written Exam (Final)**	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Weeks 14, 15	90
Assessment 2	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	Weeks 14, 15	10
				100 %

6- Facilities required for teaching and learning

-Class room	**Data show projectors, computers, internet**
- Library	**Available**
- Video conference programs	**Microsoft Teams**

7- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
1	Introduction to the immune system	a1, a2, a3, a4	b2, b3	c1	d1, d3
2	Innate immunity- Physical, chemical and biological barriers, inflammation, phagocytosis	a1, a2, a3	b1, b2, b3	c1	d1, d3
3	Innate immunity- Complement	a2, a3	b1, b2, b3	c1	d1, d3
4	Innate immunity- Antigen presentation	a1, a2, a3	b1, b2, b3	c1	d1, d2, d3
5	Innate like lymphocytes (Self and team-based learning)	a2	b1, b2, b3	c1	d1, d2, d3, d4
6	Adaptive immunity	a1, a2, a3, a4	b1, b2, b3	c1	d1, d2, d3

7	T cells development, activation and differentiation	a1, a2, a3	b1, b2, b3	c1	d1, d2, d3
8	B cells development, activation and differentiation	a1, a2, a3	b1, b2, b3	c1	d1, d2, d3
9	Vaccinology	a3	b2, b3	c1, c2	d1, d2, d3
10	Monoclonal antibodies	a3	b2, b3	c1	d1, d3
11	Immunochemical tests	a1	b1, b3, b4	c1, c3, c4, c5	d1, d3

** Knowledge and Understanding* ***Intellectual Skills* ****Professional and Practical Skills*
*****General and Transferable Skills*

8- List of References

	Reference	Type
1.	Janeway's Immunobiology, 9th edition 2016	Textbook
2.	Lippincott's Illustrated Reviews of Immunology, 2nd edition, 2013	Textbook
3.	Lectures handout prepared by the course members	Lecture handout
4.	www.immunologyonline.com	website
6.	http:// www.fda.gov http://www.drugs.com http:// www.pubmed.com https://www.who.int/ https://www.medscape.com/pharmacists	websites

9. Signature

Course Coordinator	Head of Department	Date
Prof. Hany Ibrahim Kenawy	**Prof. El Sayed El Sherbeny Habib**	10/11/2021

* Date of Dept. Council Approval

Dept. of Microbiology and Immunology	Course Specification	Microbiology & Immunology Diploma

Microbiology & Immunology Diploma

Course Specification

Academic year: 2021/2022

البرنامج
دبلوم:الميكروبيولوجيا والمناعة

توصيف مقرر
البكتريولوجيا العامة
General Bacteriology

رئيس القسم
أ د. السيد الشربينى حبيب

منسق المقرر
أ.د. مني ابراهيم شعبان

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	**Microbiology & Immunology**
Department supervising the course	**Microbiology & Immunology**
Program on which the course is given	**Microbiology & Immunology** Diploma
Academic Level	Postgraduate
Academic year	2021/2022 - First semester
Date of course specification approval	10/ 11/2021

A.Basic Information :Course data :

Course Title	General Bacteriology
Course Code	PMD-101
Prerequisite	------
Teaching Hours: Lecture	عدد الساعات الزمنية2
Practical:	عدد الساعات الزمنية 2
Total Credit Hours	3

B. Professional Information

1- Overall Aims of Course:

After completion of the course, the graduate will be able to identify the common bacterial pathogens, understand the mechanisms of pathogenesis, describe the clinical manifestation of disease and diagnose disease based on clinical laboratory data, describe the epidemiology of bacterial infections and preventive measures and suggest the treatment of disease.

2- Intended Learning Outcomes (ILOs)

a. *Knowledge and Understanding*

After completion of the course, graduates will be able to

A1	a1	Recognize the different sources of bacterial infections
A2	a2	Explain the clinical features of bacterial infections
A4	a3	Illustrate the laboratory diagnosis of different bacterial diseases and their treatment.

b. Intellectual Skills

After completion of the course, graduates will be able to

(B1)	b1	Formulate a systemic approach for the laboratory diagnosis of bacterial clinical conditions
(B3)	b2	Design a systemic approach/scheme for identification of bacterial pathogen
(B5)	b3	Apply the pharmaco-therapeutic principles in the proper selection and use of drugs for various bacterial infections

c. Professional and Practical Skills

After completion of the course, graduates will be able to

(C2)	c1	Utilize different measures to monitor, control and prevent of bacterial infections.
(C1)	c2	Apply and utilize different laboratory techniques for diagnosis of bacterial diseases

d. General and Transferable Skills

After completion of the course, graduates will be able to

(D5)	d1	Work effectively in team and to solve scientific problems
(D4)	d2	Able to use official internet sites to get updated information
(D7)	d3	Able to use standard references and extract relevant information

3. Course Contents

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1	Gram Positive and Gram-negative cocci	4	4
2			
3	Gram Positive bacilli	4	4
4			
5	Gram Negative bacilli	8	8
6			
7			
8			

9	Spirochetes, Acid fast bacteria, Mycoplasma, Chlamydia and Rickettsia	4	4
10			
Total: 10 weeks		**20**	**20**

4- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
1	Gram positive and Gram negative cocci	a1, a2, a3	b1, b2, b3	c1, c2	d1, d2, d3
2					
3	Gram positive bacilli	a1, a2, a3	b1, b2, b3	c1, c2	d1, d2, d3
4					
5	Gram negative bacilli	a1, a2, a3	b1, b2, b3	c1, c2	d1, d2, d3
6					
7					
8					
9	Spirochetes, Acid fast bacteria, *Mycoplasma*, *Chlamydia* and *Rickettsia*	a1, a2, a3	b1, b2, b3	c1, c2	d1, d2, d3
10					

** Knowledge and Understanding **Intellectual Skills***Professional and Practical Skills ****General and Transferable Skills*

5- Teaching and Learning Methods:

5.1	**Practical Training / Laboratory**
5.2	**Case study**
5.3	**Practical Training / Laboratory**
5.4	**Seminar**
5.75	**Case study**

6- Student Assessment:

	Assessment Methods		Assessment Schedule	Weighing of Assessments
Assessment 1	**Written Exam (Final)**	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Week 15	70 %
Assessment 2	**Tutorial / or Practical** assignments **and Semester work**	Assignments prepared by students and sent to the supervisor electronically for evaluation. To assess professional skills Practical skills are assessed through practical exams	Week 13	20 %
Assessment 3	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	Week 15	10 %
				100 %

7- List of References

	Reference	Type
1.	Principles and practice of infectious diseases (Vol. 1). Elsevier Health Sciences. Bennett, J.E., Dolin, R. and Blaser, M.J., 2014.	Text book
2.	Medical microbiology. Elsevier Health Sciences. Murray, P.R., Rosenthal, K.S. and Pfaller, M.A., 2015.	Text book
3.	The Sanford Guide to Antimicrobial Therapy 2020 by M.D. Gilbert, By David N. (Editor), M.D. Chambers, Henry F. (Editor), M.D. Eliopoulos, George M. (Editor), M.D. Saag, Michael S. (Editor), M.D. Pavia, Andrew T. (Editor)	Text book
4.	Cellular and Molecular Immunology 9th Edition.by Abul K. Abbas MBBS (Author), Andrew H. Lichtman MD PhD (Author), Shiv Pillai MBBS PhD (Author)	Text book
5.	https://www.who.int/	Internet Sites

8- Facilities required for teaching and learning

-Class room	**Data show- Computers, Internet.**

- Laboratory facilities	**Microscopes, equipment, tools**

9. Signature

Course Coordinator	Head of Department	Date
Prof. Dr. Mona Ibrahem Shaaban	Prof Dr. **El Sayed El Sherbiny Habib**	10/ 11 /2021

Dept. of Microbiology and Immunology.	Course Specification	Microbiology and Immunology Diploma

Microbiology and Immunology Diploma

Course Specification

Academic year: 2021/2022

البرنامج دبلوم الميكروبيولوجيا والمناعة	توصيف مقرر الفطريات والفيروسات العامة **General Mycology & Virology**
رئيس القسم أ.د. السيد الشربينى حبيب	منسق المقرر أ.د. محمد محمد عادل السكرى

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Microbiology and Immunology
Department supervising the course	Microbiology and Immunology
Program on which the course is given	Microbiology and Immunology Diploma Program
Academic Level	Postgraduate
Academic year	First semester -2021/2022
Date of course specification approval	10/11/2021

A.Basic Information : Course data :

Course Title	General Mycology & Virology	
Course Code	PMD-102	
Prerequisite	------	
Teaching credit hours: Lecture	2	عدد الساعات الزمنية
Practical:	1	عدد الساعات الزمنية
Total Credit Hours	3	

B. Professional Information

1- Overall Aims of Course:
by the end of this course, graduates should be able to:

1- Identify numerous examples on viral and fungal diseases.
2- Define the symptoms of viral and fungal diseases.
3- Identify different routes of transmission and lines of treatment.
4- Describe the variable tools used for diagnosis of viral and fungal diseases.

2- Intended Learning Outcomes (ILOs)

a. *Knowledge and Understanding*

After completion of the course, graduates will be able to

a1	Outline the basic concepts in mycology and virology
a2	Describe the methods of diagnosis of viral and fungal diseases
a3	Identify the strategies by which such organisms attack the human body and replicate.
a4	Describe the most common antimycotic and antiviral agents and tools for both passive and active immunization

b. Intellectual Skills

After completion of the course, graduates will be able to

b1	Distinguish the signs and symptoms of each disease
b2	Understand the way of transmission of viral and fungal diseases
b3	Understand the way by which the immune system respond to viral and fungal infection and how to be utilized as a tool for detection of recent and old infections

c. Professional and Practical Skills

After completion of the course, graduates will be able to

c1	Predict and select the best control tools to prevent disease complications
c2	Select the best method for treatment of viral and fungal diseases
c3	Understand the variable tools for diagnosis of viral and fungal diseases
c4	Apply different molecular tools for quantitative assay of viral and fungal diseases

d. General and Transferable Skills

After completion of the course, graduates will be able to

d1	Participate in public health care of the community and similar programs
d2	Illustrate the most common protection tools for pandemics
d3	Participate in programs of prevention of viral diseases by immunization
d4	Clarify the side effects and hazards upon application of treatment strategies

3. Course Contents

Week No.	Lecture Topics	Credit hours
1	Introduction	2
2	Methods for detection of viral and fungal diseases	2
3	Mycotic diseases	2
4	RNA viruses part 1	2
5	RNA viruses part 2	2

6	DNA viruses part 1 (Herpesviridae family of viruses including HSV1, HSV2, Varicella zoster virus, CMV, Epstein-Barr virus, HHV6, HHV7 and HHV8)	2
7	DNA viruses part 2 (Hepatitis B virus)	2
8	DNA viruses (Adenovirus, B19 parvovirus, Human papillomavirus and poxviruses)	2
Total 8 weeks		16
Week No.	**Practical / Tutorial topics**	**hours**
1	Introduction	2
2	Methods for detection of fungi	2
3	Methods for detection of viruses	2
4	Serological diagnostic methods	2
5	Molecular detection of viral and fungal diseases	2
6	Tissue culture	2
Total 6 weeks		12

4- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
1	Introduction	a1,a2,a3,a4			d1
2	Methods for detection of viral and fungal diseases	a1,a2	b2		
3	Mycotic diseases	a1,a2,a3	b2,b3	c1,c2,c3,c4	
4	RNA viruses part 1	a1,a2,a3,a4	b1,b2,b3	c1,c2,c3,c4	d1,d2,d3,d4
5	RNA viruses part 2	a1,a2,a3,a4	b1,b2,b3	c1,c2,c3,c4	d1,d2,d3,d4

6	DNA viruses part 1 (Herpesviridae family of viruses including HSV1, HSV2, Varicella zoster virus, CMV, Epstein-Barr virus, HHV6, HHV7 and HHV8)	a1,a2,a3,a4	b1,b2,b3	c1,c2,c3,c4	d1,d2,d3,d4
7	DNA viruses part 2 (Hepatitis B virus)	a1,a2,a3,a4	b1,b2,b3	c1,c2,c3,c4	d1,d2,d3,d4
8	DNA viruses (Adenovirus, B19 parvovirus, Human papillomavirus and poxviruses)	a1,a2,a3,a4	b1,b2,b3	c1,c2,c3,c4	d1,d2,d3,d4

** Knowledge and Understanding* ***Intellectual Skills* ****Professional and Practical Skills*
*****General and Transferable Skills*

5- Teaching and Learning Methods:

5.1	Lectures using Power Point (PPT) presentations
5.2	Activities and tasks required to develop students' self-learning skills.
5.3	Tutorial, Class Activity and Group Discussion to explain what has not been understood
5.4	Practical Training / Laboratory

6- Student Assessment:

	Assessment Methods		**Assessment Schedule**	**Weighing of Assessments**
Assessment 1	**Written Exam (Final)**	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Week 15	70
Assessment 2	**Tutorial / or Practical** assignments **and Semester work**	Assignments prepared by students and sent to the supervisor electronically for evaluation. To assess professional skills	Week 13	20
Assessment 3	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	Week 15	10
				100 %

7- List of References

	Reference	Type
1	Richard A. Harvey Lipencott's "Illustrated Reviews in Microbiology" 3rd edition	Essential Book **(Text Books)**
2	Jawetz, Melnick and Adelberg's "Medical Microbiology" 25th edition	Essential Book **(Text Books)**
3	Warren Levenson's "Review of Medical Microbiology and Immunology" 10th edition	Essential Book **(Text Books)**
4	http://www.pubmed.com https://www.ekb.eg	Websites

8- Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
- Laboratory facilities	Microscopes, reagents, kits, PCR and qPCR machines …….
- Library	Available Textbooks
Others	Online developed learning services

9. Signature

Course Coordinator	Head of Department	Date
Prof. Mohamed Mohamed Adel El-sokkary	Prof El-Sayed E. Habib	10/11/2021

* Date of Dept. Council Approval

Dept. of Microbiology & Immunology	Course Specification	Microbiology & Immunology Diploma

Microbiology & Immunology Diploma

Course Specification

Academic year: 2021/2022

البرنامج	توصيف مقرر
دبلوم الميكروبيولوجيا و المناعة	الميكروبيولوجيا التشخيصية Diagnostic Microbiology

رئيس القسم	منسق المقرر
ا. د. السيد الشربينى حبيب	د. دينا عيد

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Microbiology & Immunology
Department supervising the course	----
Program on which the course is given	Microbiology & Immunology Diploma Program
Academic Level	Postgraduate
Academic year	2021/2022
Date of course specification approval	December 2021

A.Basic Information : Course data :

Course Title	**Diagnostic Microbiology**
Course Code	PMD-106
Prerequisite	------
Teaching Hours: Lecture	عدد الساعات الزمنية 2
Practical:	عدد الساعات الزمنية 2
Total Credit Hours	3

B. Professional Information

1- Overall Aims of Course:

The graduates of the Diploma Degree of Microbiology and Immunology should be capable of:

1.1 Mastering of advanced knowledge, professional research skills in the field of diagnostic microbiology.

1.2 Mastering of all traditional and new techniques used in the field of diagnostic microbiology.

1.3 Applying the basics and methodologies of scientific research and manipulating its various tools in the field of diagnostic microbiology.

1.4 Utilizing different available information resources relevant to diagnostic microbiology.

2- Intended Learning Outcomes (ILOs)

a. *Knowledge and Understanding*

After completion of the course, graduates will be able to

a1	Express properly the principles and different methods used in diagnostic microbiology
a2	Understand the moral and legal principles for professional practices in diagnostic microbiology
a3	Identify the effect of diagnosis and treatment of different infections on the environment
a4	Describe a basic understanding of quality assurance in the diagnostic laboratory and the range of diagnostic tests available and the circumstances in which they are used

b. Intellectual Skills

After completion of the course, graduates will be able to

b1	Analyze and interpret data obtained from diagnosis of microorganisms and utilize them in identification and treatment.
b2	Analyze laboratory problems effectively and correctly interpret and explain results simply and effectively to clinicians and patients.
b3	Take professional decisions in selection of the most methods for diagnosis and treatment of different infections
b4	Take professional decisions in different issues during research
b5	Evaluate research topics related to diagnostic microbiology and utilize them in a specific and suitable form.

c. Professional and Practical Skills

After completion of the course, graduates will be able to

c1	Use efficiently the acquired skills in the field of diagnostic microbiology to improve the professional practice.
c2	Write professional reports in the field of diagnostic microbiology.

d. General and Transferable Skills

After completion of the course, graduates will be able to

d1	Communicate clearly by verbal and written means.
d2	Use technological means in a better professional practice.
d3	Practice self- assessment and learning needed for continuous professional development.
d4	Utilize different available information resources relevant to diagnostic microbiology.

d5	Work effectively in a team and offer expertise and advice to others
d6	Develop creativity and time management abilities.
d7	Practice self-assessment for continuous learning.

3. Course Contents:

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1	Introduction to diagnostic microbiology	2	2
2	Conventional and advanced diagnostic techniques	2	2
3	Diagnosis of common microorganisms of Lower respiratory tract infections.	2	2
4	Diagnosis of common microorganisms of Upper respiratory tract infections	2	2
5	Diagnosis of common microorganisms of urinary tract infections.	2	2
6	Diagnosis of common microorganisms of cardiovascular system infections.	2	2
7	Diagnosis of common microorganisms of skin infections.	2	2
8	Diagnosis of common microorganisms of GIT infections.	2	2
9	Diagnosis of common microorganisms of GIT infections.	2	2
10	Diagnosis of common microorganisms of genito-urinary tract infections (sexually transmitted diseases)	2	2
11	Diagnosis of common microorganisms of nervous system infections.	2	2
Total: 11 weeks		**22**	**22**

4- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
1	Introduction to diagnostic microbiology	a1, a2	b4, b5	c1	d1, d3
2	Conventional and advanced diagnostic techniques	a3, a4	b1, b2, b3	c1, c2	d2,d4
3	Diagnosis of common microorganisms of Lower respiratory tract infections.	a3, a4	b1, b2, b3	c1, c2	d2,d4
4	Diagnosis of common microorganisms of Upper respiratory tract infections	a3, a4	b1, b2, b3	c1, c2	d2,d4
5	Diagnosis of common microorganisms of urinary tract infections.	a3, a4	b1, b2, b3	c1, c2	d2,d4
6	Diagnosis of common microorganisms of cardiovascular system infections.	a3, a4	b1, b2, b3	c1, c2	d2,d4
7	Diagnosis of common microorganisms of skin infections.	a3, a4	b1, b2, b3	c1, c2	d2,d4
8	Diagnosis of common microorganisms of GIT infections.	a3, a4	b1, b2, b3	c1, c2	d2,d4
9	Diagnosis of common microorganisms of GIT infections.	a3, a4	b1, b2, b3	c1, c2	d2,d4
10	Diagnosis of common microorganisms of genito-urinary tract infections (sexually transmitted diseases)	a3, a4	b1, b2, b3	c1, c2	d2,d4
11	Diagnosis of common microorganisms of nervous system infections.	a3, a4	b1, b2, b3	c1, c2	d2,d4

** Knowledge and Understanding* ***Intellectual Skills* ****Professional and Practical Skills*
*****General and Transferable Skills*

5- Teaching and Learning Methods:

5.1	**Lectures using Power Point** (PPT) presentations
5.2	Activities and **tasks required to develop students' self-learning skills**.
5.3	**Tutorial**, **Class Activity** and **Group Discussion** to explain what has not been understood
5.4	**Practical Training / Laboratory**

6- Student Assessment:

	Assessment Methods		**Assessment Schedule**	**Weighing of Assessments**
Assessment 1	**Written Exam (Final)**	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Week 12	70%
Assessment 2	**Tutorial / or Practical** assignments **and Semester work**	Assignments prepared by students and sent to the supervisor electronically for evaluation. To assess professional skills	Week 10	20%
Assessment 3	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	Week 12	10%
				100 %

7- List of References

No.	Reference	Type
1	Lectures notes, prepared by the faculty members	Course Notes
2	Advanced Techniques in Diagnostic Microbiology Tang, Yi-Wei, Stratton, Charles W. 2013	Text book
3	Jawetz, Melnick and Adelberg's Medical microbiology, 19th edn, Appleton and Lange, 2007.	Text book
4	Bailey & Scott's diagnostic microbiology 13th ed. Patricia M. Tille,; Published 2014	Text book

8- Facilities required for teaching and learning

-Class room	**Data show- Computers, Internet.**
- Laboratory facilities	**Microscopes, equipment, tools**
- Library	**……**
Others	

9. Signature

Course Coordinator	Head of Department	Date
Dr. Dina Eid	Prof. Dr. El-Sayed El-sherbiny Habib	8/12/2021

* Date of Dept. Council Approval

Dept. of Microbiology & Immunology	Course Specification	Microbiology & Immunology Diploma

Microbiology & Immunology Diploma

Course Specification

Academic year: 2021/2022

البرنامج	توصيف مقرر
دبلوم الميكروبيولوجيا و المناعة.	Microbiological Quality control & Quality assurance
رئيس القسم	منسق المقرر
ا. د. السيد الشربينى حبيب	ا. د. محمد السكرى

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Microbiology & Immunology
Department supervising the course	----
Program on which the course is given	Microbiology & Immunology Diploma Program
Academic Level	Postgraduate
Academic year	2021/2022
Date of course specification approval	8/12/2021

A.Basic Information : Course data :

Course Title	**Microbiological Quality control & Quality assurance Course**
Course Code	PMD-107
Prerequisite	------
Teaching Hours: Lecture	2 عدد الساعات الزمنية
Practical:	2 عدد الساعات الزمنية
Total Credit Hours	3

B. Professional Information

1- Overall Aims of Course:

On completion of the course, the graduate will be able to Know different sources of microbial contamination and different methods used for preserving pharmaceutical dosage forms, demonstrating different methods of sterilization and understanding the nature of activity of antimicrobials either single or in combination. Additionally, the student will be able evaluate the activity of disinfectants, preservatives and antiseptics using appropriate methods.

2- Intended Learning Outcomes (ILOs)

a. *Knowledge and Understanding*

After completion of the course, graduates will be able to

a1	Identify various methods of sterilization
a2	Distinguish appropriate Quality Control (QC) criteria to aseptic and sterile production facilities and other pharmaceutical industry

a3	Discuss the principles of source of contamination, control of microbial contamination, sanitation, disinfection, and microbiological QC of pharmaceutical products.
a4	Evaluation of activity of different antimicrobial agents

b. Intellectual Skills

After completion of the course, graduates will be able to

b1	Recommend good laboratory practice (GLP), good clinical practice (GCP) and good pharmacy practice.
b2	Utilize legal and ethical guidelines to ensure the correct and safe supply of medical products to the general public.
b3	Apply the appropriate pharmacopeia principles in the proper selection and use of suitable sterilization method

c. Professional and Practical Skills

After completion of the course, graduates will be able to

c1	Examine the sterility and the efficiency of sterilization of pharmaceutical preparation
c2	Apply biological methods for quality control (QC) and assay of raw materials as well as pharmaceutical preparations.
c3	Apply the appropriate pharmacopeia principles in the proper method for the quality control of the selected method of sterilization

d. General and Transferable Skills

After completion of the course, graduates will be able to

d1	Work effectively in team and to solve scientific problems
d2	Able to use official internet sites to get updated information
d3	Able to use standard references and extract relevant information

3. Course Contents:

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1	Physical method of sterilization	4	4
2			

3	Mechanical method of sterilization	2	2
4	Disinfectants and antiseptic	2	2
5	Preservatives	2	2
6	Quality control of sterile pharmaceutical products	4	4
7			
8	Quality control of non sterile pharmaceutical products	2	2
9	Evaluation of preservatives and antiseptic	2	2
10	Evaluation of disinfectant	2	2
Total: 10 weeks		**20**	**20**

4- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
1	Physical method of sterilization	a1	b1, b3	c1	d1, d2, d3
2					
3	Mechanical method of sterilization	a1	b1, b3	c1	d1, d2, d3
4	Disinfectants and antiseptic	a1	b1, b3	c1	d1, d2, d3
5	Preservatives	a1	b1, b3	c1	d1, d2, d3
6	Quality control of sterile pharmaceutical products	a2, a3	b2	c1, c2, c3	d1, d2, d3
7					
8	Quality control of non sterile pharmaceutical products	a2, a3	b2	c1, c2, c3	d1, d2, d3
9	Evaluation of preservatives and antiseptic	a4	b2	c1, c2, c3	d1, d2, d3
10	Evaluation of disinfectant	a4	b2	c1, c2, c3	d1, d2, d3

** Knowledge and Understanding* ***Intellectual Skills* ****Professional and Practical Skills*
*****General and Transferable Skills*

5- Teaching and Learning Methods:

5.1	**Lectures using Power Point** (PPT) presentations
5.2	Activities and **tasks required to develop students' self-learning skills**.
5.3	**Tutorial**, **Class Activity** and **Group Discussion** to explain what has not been understood
5.4	**Practical Training / Laboratory**

6- Student Assessment:

	Assessment Methods		**Assessment Schedule**	**Weighing of Assessments**
Assessment 1	**Written Exam (Final)**	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Week 15	70%
Assessment 2	**Tutorial / or Practical** assignments **and Semester work**	Assignments prepared by students and sent to the supervisor electronically for evaluation. To assess professional skills	Week 13	20%
Assessment 3	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	Week 15	10%
				100 %

7- List of References

	Assessment Methods		**Assessment Schedule**	**Weighing of Assessments**
Assessment 1	**Written Exam (Final)**	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Week 15	70 %
Assessment 2	**Tutorial / or Practical** assignments **and Semester work**	Assignments prepared by students and sent to the supervisor electronically for evaluation. To assess professional skills	Week 13	20 %

		Practical skills are assessed through practical exams		
Assessment 3	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	Week 15	10 %
				100 %

8- Facilities required for teaching and learning

-Class room	**Data show- Computers, Internet**. ……..
- Laboratory facilities	**Microscopes, equipment, tools** …….
- Library	**……**
Others	

9. Signature

Course Coordinator	Head of Department	Date
Prof. Dr. Mohammed ELSokkary	Prof. Dr. El-Sayed El-sherbiny Habib	8/12/2021

* Date of Dept. Council Approval

Dept. of Microbiology and Immunology.	Course Specification	Microbiology and Immunology Diploma

Microbiology and Immunology Diploma

Course Specification

Academic year: 2021/2022

البرنامج دبلوم الميكروبيولوجي و المناعة	توصيف مقرر التقنيات الميكروبيولوجية المتقدمة Advanced Microbiological Techniques Specification
رئيس القسم أ.د. السيد الشربينى حبيب	منسق المقرر ا.د. محمد محمد عادل السكرى

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Microbiology and Immunology
Department supervising the course	Microbiology and Immunology
Program on which the course is given	Microbiology and Immunology Diploma Program
Academic Level	Postgraduate
Academic year	2021/2022 - Second semester
Date of course specification approval	8/12/2021

A.Basic Information : Course data :

Course Title	Advanced Microbiological Techniques
Course Code	PMD-109
Prerequisite	------
Teaching Hours: Lecture	16 عدد الساعات الزمنية
Practical:	0 عدد الساعات الزمنية
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

1- Identification of advanced microbiological techniques.
2- Provide the students with the basic information about different molecular methods for sequence detection.
3- Identification of microbiological techniques used for typing
4- Provide the students with the basic information about quantitative molecular tools for diagnosis.

2- Intended Learning Outcomes (ILOs)

a. *Knowledge and Understanding*

After completion of the course, graduates will be able to

a1	Understanding molecular diagnosis of different diseases
a2	Know the principles of these tools
a3	Identify the strategies by which different tools are implemented
a4	Knowledge of the most common molecular tools used

b. Intellectual Skills

After completion of the course, graduates will be able to

b1	Classification of microorganisms based on different advanced microbiological tools
b2	Distinguish variable mechanisms behind these tools
b3	Appreciate the value and the speed of these tools
b4	Understand the way by which commercial identification kits are developed

c. Professional and Practical Skills

After completion of the course, graduates will be able to

c1	Early prediction and selection of best tools to screen different samples
c2	Design and validation of molecular probes for diagnosis
c3	Application of variable tools for diagnosis of epidemic infectious strains
c4	Selection of the best method for treatment of monitoring the therapeutic progress

d. General and Transferable Skills

After completion of the course, graduates will be able to

d1	Participate in public health care of the community and similar programs
d2	Illustrate the most common detection tools for pandemics
d3	Provide useful information for individuals concerning molecular vaccines for immunization for all age groups
d4	Provide useful information for early detection and diagnosis methods and their sensitivity

3. Course Contents

Week No.	Lecture Topics	Hours
1	Molecular methods for microbial detection	2
2	Microarrays	2
3	Methods for DNA sequencing	2
4	Tools in Bioinformatics	2
5	Phylogenetic Trees	2
6	PCR and Quantitative PCR	2

7	Cloning Vectors	2
8	Western Blotting	2
Total 8 weeks		16

4- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
1	Molecular methods for microbial detection	a1,a2,a3,a4	b1,b2,b3,b4	c1,c2,c3,c4	d1,d2,d3,d4
2	Microarrays	a1,a2,a3,a4	b1,b2,b3,b4	c1,c2,c3,c4	d4
3	Methods for DNA sequencing	a1,a2	b1,b2,b3	c1,c2,c3	d2,d4
4	Tools in Bioinformatics	a1,a2,a3,a4	b1,b2,b3,b4	c1,c2,c3,c4	d1,d2,d3,d4
5	Phylogenetic Trees	a1,a2,a3,a4	b1,b2,b3,b4	c1,c2,c3,c4	d1,d2,d3,d4
6	PCR and Quantitative PCR	a1,a2,a3,a4	b1,b2,b3,b4	c1,c2,c3,c4	d1,d2,d3,d4
7	Cloning Vectors	a2,a3,a4	b2,b3,b4	c4	d3
8	Western Blotting	a2,a3	b1,b2,b3,b4	c1,c2,c3,c4	d1,d2,d4

** Knowledge and Understanding* ***Intellectual Skills* ****Professional and Practical Skills*
*****General and Transferable Skills*

5- Teaching and Learning Methods:

5.1	**Lectures using Power Point** (PPT) presentations
5.2	**Lectures using whiteboard**
	Video-recorded lectures, uploaded to the University Portal for Online learning
	Activities and **tasks required to develop students' self-learning skills**.
	Tutorial, **Class Activity** and **Group Discussion** to explain what has not been understood
	Interactive Sessions using Microsoft Teams
	Internet search and Research Assignments to design **Formative Assignments**
	Practical Training / Laboratory
	Seminar / Workshop
	Case study

6- Student Assessment:

	Assessment Methods		Assessment Schedule	Weighing of Assessments
Assessment 1	**Written Exam (Final)**	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Week 15	90
Assessment 2	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	Week 15	10
				100 %

7- List of References

	Reference	Type
1	Richard A. Harvey Lipencott's "Illustrated Reviews in Microbiology" 3rd edition	Essential Book **(Text Books)**
2	Jawetz, Melnick and Adelberg's "Medical Microbiology" 25th edition	Essential Book **(Text Books)**
3	Warren Levenson's "Review of Medical Microbiology and Immunology" 10th edition	Essential Book **(Text Books)**

8- Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
- Laboratory facilities	Microscopes, equipment, tools, PCR and qPCR machines
- Library	Available Textbooks
Others	Online developed learning services including online exams

9. Signature

Course Coordinator	Head of Department	Date
Prof .Dr. Mohamed El-Sokkary	Prof Dr. El-Sayed El-Shirbini Habib	8/12/2021

* Date of Dept. Council Approval

Dept. of Microbiology & Immunology	Course Specification	Microbiology & Immunology Diploma

Microbiology & Immunology Diploma

Course Specification

Academic year: 2021/2022

توصيف مقرر **التقنية الحيوية** **Biotechnology**	**البرنامج** **دبلوم الميكروبيولوجيا و المناعة.**
منسق المقرر **د. عبير عبد العزيز**	**رئيس القسم** **ا. د. السيد الشربينى حبيب**

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Microbiology & Immunology
Department supervising the course	Microbiology & Immunology
Program on which the course is given	Microbiology & Immunology Diploma Program
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	8/12/2021

A.Basic Information : Course data :

Course Title	**Biotechnology**
Course Code	PMD-105
Prerequisite	------
Teaching Hours: Lecture	2 عدد الساعات الزمنية
Practical:	1 عدد الساعات الزمنية
Total Credit Hours	3

B. Professional Information

1- Overall Aims of Course:

The graduates of the Diploma Degree of Microbiology and Immunology should be capable of:

1- Provide students with basis of microbial biotechnology including definitions, etc.
2- Provide students with basic information on strain requirement, raw materials as sources of carbon, nitrogen and the use of biotechnology products and equipment.
3- Provide students with basic information about the use of microorganisms in the production of different useful pharmaceuticals including alcohols, antibiotics, etc.
4- Provide students with basic information about rDNA technology and the production of human insulin and hepatitis B vaccine by genetic manipulation.
5- Provide the students with basic information on different types PCR, including real time PCR, their prudent use and analysis of data.
6- Provide the students with basic information on different DNA sequencing techniques.

7- Increase students knowledge about recent therapeutic options as Gene therapy and Bacteriophage therapy

2- Intended Learning Outcomes (ILOs)

a. *Knowledge and Understanding*

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
A1	a1	Express properly the theories and principles of microbiology biotechnology.
A2	a2	Understand the moral and legal principles for professional practices in biotechnology.
A3	a3	Recognize the effect of biotechnology on the environment.

b. Intellectual Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
B1	b1	Analyze and interpret data obtained from biotechnology research and utilize them in a specific and suitable form
B2	b2	Identify possible hazards on environment and how to deal with them effectively.
B3	b3	Take professional decisions in different issues during research.
B4	b4	Evaluate research topics related to biotechnology research and utilize them in a specific and suitable form.

c. Professional and Practical Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
C1	c1	Use efficiently the acquired skills in the field of microbiology and immunology to improve the professional practice.
C2	c2	Write professional reports in the field of biotechnology.

d. General and Transferable Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
D1	d1	Communicate clearly by verbal and written means.
D2	d2	Use technological means in a better professional practice.
D3	d3	Practice self-assessment and learning needed for continuous professional development.
D4	d4	Utilize different available information resources relevant to microbiology and biotechnology.
D5	d5	Work effectively in a team and offer expertise and advice to others.
D6	d6	Develop creativity and time management abilities.
D7	d7	Practice self assessment for continuous learning.

3. Course Contents:

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1	Introduction to biotechnology, industrial microbiology, industrial microorganisms and fermentation media	2	1
2	Fermentation techniques, fermenters and bioreactors of submerged fermentation	2	1
3	Fermentation upstream and downstream processes and bioreactors of emerged fermentation	2	1
4	Applications of fermentation process.	2	1
5	Bioremediation and bioleaching	2	1
6	Industrial fermentation technology; use of microorganisms in the production of alcoholic beverages,	2	1
7	Biotechnology resources, and advanced biotechniques, Research study	2	1
8	rDNA technology and the production of human insulin and hepatitis B vaccine by genetic manipulation	2	1
9	Types of PCR and DNA sequencing techniques	2	1

10	Gene Therapy	2	1
11	Bacteriophage Therapy and Phage display Techniques	2	1
Total: 11 weeks		**22**	**11**

4- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
1	Introduction to biotechnology, industrial microbiology, industrial microorganisms and fermentation media	a1, a2, a3	b2, b3	c1	d1, d3
2	Fermentation techniques, fermenters and bioreactors of submerged fermentation	a1	b3, b4	c1,c2	d4, d5, d6
3	Fermentation upstream and downstream processes and bioreactors of emerged fermentation	a1	b3, b4	c1,c2	d4, d5, d6
4	Applications of fermentation process.	a1	b3, b4	c1,c2	d4, d5, d6
5	Bioremediation and bioleaching		b3, b4	c1,c2	d7
6	Industrial fermentation technology; use of microorganisms in the production of alcoholic beverages,	a1, a2, a3	b3, b4	c1,c2	d1, d2, d3
7	Biotechnology resources, and advanced biotechniques, Research study	a1, a2, a3	b1, b2	c1	d1, d2, d3
8	rDNA technology and the production of human insulin and hepatitis B vaccine by genetic manipulation	a3	b3, b4	c1,c2	d1, d2, d3
9	Types of PCR and DNA sequencing techniques	a3	b3, b4	c1	d1, d2, d3
10	Gene Therapy	a2, a3	b3, b4	c1	d1, d2, d3
11	Bacteriophage Therapy and Phage display Techniques	a2, a3	b1, b2	c1,c2	d7

** Knowledge and Understanding* ***Intellectual Skills* ****Professional and Practical Skills*
*****General and Transferable Skills*

5- Teaching and Learning Methods:

5.1	Computer aided learning: a. Lectures using whiteboard or data show, power Point presentations b. Lectures uploaded to the Google drive of the program
5.2	Activities and **tasks required to develop students' self-learning skills**.
5.3	**Tutorial**, **Class Activity** and **Group Discussion** to explain what has not been understood
5.4	**Practical Training / Laboratory**

6- Student Assessment:

	Assessment Methods		**Assessment Schedule**	**Weighing of Assessments**
Assessment 1	**Written Exam (Final)**	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Week 14,15	70%
Assessment 2	**Tutorial / or Practical** assignments **and Semester work**	Assignments prepared by students and sent to the supervisor electronically for evaluation. To assess professional skills	Week 11	20%
Assessment 3	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	Week 14,15	10%
				100 %

7- List of References

No.	Reference	Type
1	Basic Biotechnology Kristiansen B, Ratledge C, editors. Basic biotechnology. Cambridge University Press; 2001.	Essential Book **(Text Books)**
2	Rastegari AA, Yadav AN, Yadav N, editors. New and future developments in microbial biotechnology and bioengineering: trends of microbial biotechnology for sustainable agriculture and biomedicine systems: diversity and functional perspectives. Elsevier; 2020 May 16.	Essential Book **(Text Books)**
3	www.asmjournals.com www.sciencedirect.com	websites

8- Facilities required for teaching and learning

-Class room	**Data show- Computers, Internet.**
- Laboratory facilities	**Microscopes, equipment, tools**
- Library	**Available**
- Video conference	**Microsoft Teams**

9. Signature

Course Coordinator	Head of Department	Date
Dr. Abeer Abd-el Aziz	Prof. Dr. El-Sayed El-sherbiny Habib	8/12/2021

* Date of Dept. Council Approval