



Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
Academic Reference Standards (ARS)
M. Sc. Program
2021/2022
Postgraduate Studies



Academic Reference Standards (ARS)
Master in Pharmaceutical Sciences
(Pharmacognosy)



ARS

Academic Year: 2021/2022

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Master in Pharmaceutical Sciences (Pharmacognosy)

Academic Reference Standards (ARS)

*(Department Council Approval on **May 2022** and Faculty Council Approval on
(.....))*

1. Graduate Attributes

*The graduates of Master degree of Pharmaceutical sciences
(Pharmacognosy) should be able to:*

- 1.1. Applying the fundamentals and methodologies of scientific research and the use of its different tools in the field of pharmacognosy.
- 1.2. Employing the analytical method and use it in the area of natural product research.
- 1.3. Applying specialized knowledge and integrate it with the knowledge related to professional practice.
- 1.4. Showing awareness of current problems and modern theories in the field of pharmacognosy.
- 1.5. Identifying professional problems in the field of pharmacognosy and find solutions to them.
- 1.6. Mastering a suitable range of specialized professional skills and the use of appropriate technological means to serve the professional practice.
- 1.7. Communicate effectively and the ability to lead a team.
- 1.8. Taking Decision in different professional contexts.
- 1.9. Employing available resources to bring the greatest benefit from them and maintain them.
- 1.10. Showing awareness in his/her role in the community development and environmental conservation in the light of the global and regional variables.



- 1.11. Reflecting the commitment to integrity and credibility and the rules of the profession.
- 1.12. Self-development academically and professionally and capability of continuous learning.

2. General Standards

2.1. Knowledge and Understanding

Upon successful completion of the Master program, the graduate should be able to understand and be familiar with:

- 2.1.1. Identify the theories and fundamentals in the area of Pharmacognosy as well as related fields.
- 2.1.2. Detect the mutual influence between professional practice of Pharmacognosy and its impact on the environment.
- 2.1.3. Recognize the recent and advanced scientific developments in the field of pharmacognosy.
- 2.1.4. Distinguish ethical and legal principles of professional practice in the field of pharmacognosy.
- 2.1.5. Identify principles and fundamentals of the quality of professional practice in the field of pharmacognosy.
- 2.1.6. Distinguish the basics and ethics of scientific research in the area of natural products.

2.2. Intellectual Skills

Upon Completion of this program the graduate should be able to:

- 2.2.1. Analyze and evaluate the information in the field of pharmacognosy and other related fields.
- 2.2.2. Solve problems in the field of natural product research based on the available data.
- 2.2.3. Integrate various professional knowledge to solve problems.



- 2.2.4. Write a systematic scientific study about the research problems in the field of pharmacognosy.
- 2.2.5. Assess risk in professional practices in the area of natural product research.
- 2.2.6. Plan for the development of performance in the field of pharmacognosy.
- 2.2.7. Generate professional decisions in a variety of professional contexts.

2.3. Professional and practical skills

Upon successful completion of the Master program, the graduate should be able to:

- 2.3.1. Master basic and modern professional skills.
- 2.3.2. Write and evaluate the professional reports in pharmacognosy.
- 2.3.3. Evaluate ways and existing tools in the area of natural product research.

2.4. General and transferrable Skills

Upon Completion of this program the graduate should be able to:

- 2.4.1. Communicate effectively by various ways.
- 2.4.2. Use of information technology to serve the professional practice in the field of pharmacognosy.
- 2.4.3. Perform self-evaluation and identifying personal educational needs.
- 2.4.4. Use different sources for information and knowledge.
- 2.4.5. Develop rules and evaluate other performance indicators.
- 2.4.6. Work in a team and leading teams.
- 2.4.7. Manage time efficiently.
- 2.4.8. Continuous self-learning.



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*Department Council Approval on May 11th2022 † and
Faculty Council Approval on May*

Head of Department: Prof. Dr. Mona G. Zaghloul

Signature:



Program: Master in Pharmaceutical Sciences
(Pharmacognosy)



Program Specification for Master of Pharmacognosy

Academic Year: 2021/2022

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أ.د.

Mona.G. Zaghloul



A-Basic Information

1	Faculty	Pharmacy
2	Program Title:	Master in Pharmaceutical Sciences <i>(Pharmacognosy)</i>
3	Program Type:	Single
4	Department (s):	Department of Pharmacognosy
5	Final award:	Master degree in Pharmacognosy
6	Coordinator:	Prof. Dr. Mona Zaghloul
7	External Evaluator(s):	Prof. Dr. Maged Abo Hashem
8	Date of Program Specification Approval:	<i>Department council: --11/5/2022</i> <i>Faculty council:</i>

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 and *Pharmacognosy*.

- 1.1 Mastering of advanced knowledge, professional research skills, attitudes, and values in the field of pharmacognosy and integrating with the relevant subjects in his/her professional practice.
- 1.2 Applying the basics and methodologies of scientific research and manipulating its various tools in the field of natural products.
- 1.3 Mastering of all traditional and new techniques used in the field of chromatography and spectroscopy.
- 1.4 Getting the sense and experience of using phytochemicals from plants in phytotherapy.
- 1.5 Applying bench-top primary bioassay screening for various biological activities.
- 1.6 Assessing the principles of analytical methods suitable for the qualitative and quantitative evaluation of the active constituents of herbal drugs.
- 1.7 Employing the essential oil as a supportive treatment for various diseases.
- 1.8 Writing a thesis that involves extensive writing literature surveys and laboratory based practical work in the field of natural products.
- 1.9 Master practical research procedures according to the good laboratory practice (GLP) basics in



chemistry labs and perform experiments with safety guidelines.

- 1.10 Applying the scientific thinking approaches and problem-based learning in subjects relevant to structural elucidation of naturally occurring compounds using different spectroscopic methods.
- 1.1 Designing and conducting research projects.
- 1.2 Analyze and interpret results and information acquired from primary literature sources.
- 1.3 Attaining communication skills, research ethics, time management, decision-making, and team-working.
- 1.4 Manipulate computer program, online database, software and other IT skills to get information and analyze the obtained research data.

2-Intended Learning Outcomes (ILOs)

A-Knowledge and Understanding:

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

A1	Explain the theories and fundamentals of instrumental analysis, statistics and biostatistics, physical chemistry and bioinformatics.
A2	Identify the theories and fundamentals of bioassay-screening, herbal remedies and aromatherapy.
A3	Recognize the current problems, the recent and advanced scientific development in the field of spectroscopy and chromatography.
A4	Identify principles and fundamentals of the quality professional practice in the field of natural products.
A5	Distinguish the basics and ethics of scientific research in the area of natural drugs.
A6	Recognize the methods and techniques used for isolation, identification and structural elucidation of natural products.
A7	Identify ethical and legal principles of professional practice in the field of pharmacognosy and phytochemistry.
A8	Identify the regulatory prospective for the assessment for quality, safety and efficacy of herbal medicine in health care.
A9	Identify appropriate types of data needed to tackle a certain research problem.

B-Intellectual Skills

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

B1	Analyze and evaluate the gained information in the field of instrumental analysis, biostatistics, physical chemistry, bioinformatics and drug development.
B2	Analyze and evaluate the information in the field of bio-assay screening, herbal remedies and



	aromatherapy.
B3	Solve problems about the structural elucidation of natural products based on the available spectroscopic data.
B4	Assess the capability of choosing and validating the appropriate chromatographic separation technique.
B5	Integrate various professional knowledge to solve problems.
B6	Write a systematic scientific study about the research problems in the field of herbal medicine and natural products.
B7	Interpret and validate the obtained research data.
B8	Plan an individual research project.
B9	Assess risk in professional practices in the area of natural product research.
B10	Plan for the development of performance in the field of pharmacognosy and phytochemistry.
B11	Generate professional decisions in a variety of professional contexts.

C-Professional and Practical Skills

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

C1	Develop different research methodologies and good experimental and reporting skills in the separation and structural elucidation of the naturally occurring compounds.
C2	Manage safely and efficiently advanced technological research tools and equipments relevant to separation and biological screening of natural products.
C3	Apply efficiently aromatherapy and herbal medicine as a supportive treatment in various diseases.
C4	Carry out scientific research and contribute to the knowledge in the field pharmacognosy and phytochemistry.
C5	Write accurately, evaluate professional reports and publish scientific research papers in scientific journals and conferences.
C6	Write thesis in a scientific and precise way.
C7	Illustrate the effect of his/her professional practice on the community in addition to different methods of environmental development and maintenance.

D- General and Transferable Skills

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

D1	Communicate effectively by verbal and written means.
D2	Manipulate computer program, online database, software and other IT to get information and analyze the obtained research data.



D3	Perform self- assessment and identifying personal educational needs.
D4	Promote critical thinking, problem-solving and decision-making capabilities.
D5	Manage time efficiently.
D6	Work effectively in a team and leading teams.
D7	Evaluate and criticize scientific work, literature and research data.
D8	Adopt ethical, legal, professional responsibilities and safety guidelines.

3-Academic Reference Standards (ARS):

Approved by both the department and faculty councils

Department Council Approval Date: 11/5/2022

Faculty Council Approval Date:

3a- Academic References Standards: (Attached)

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, A2, A3
	1.2	A3, A4
	1.3	A2, A3, A4
	1.4	A7
	1.5	A4, A8
	1.6	A5, A6, A9
2. Intellectual Skills	2.1	B1
	2.2	B2, B3, B4
	2.3	B5, B7
	2.4	B6, B8
	2.5	B9
	2.6	B10
	2.7	B11
3. Professional and Practical Skills	3.1	C1, C2, C3
	3.2	C4, C5, C6
	3.3	C7
4. General and Transferable Skills	4.1	D1
	4.2	D2
	4.3	D3
	4.4	D2
	4.5	D7
	4.6	D6
	4.7	D5
	4.8	D4, D8



4-Curriculum Structure and Contents

4A. Program duration: 18 months from the date of registration -5 years.

4B. Program structure:

- The program consists of 46 credit hours of study (16 credit hours of courses and 30 credit hours for thesis).
- The program includes 16 credit hours graduate courses. These courses include 8 credit hours of general required courses of the faculty requirement, in addition to 8 credit hours of special required (6 credit hours) and special elective (2 credit hours) courses. The courses will possess the code [200] according to Faculty By-Law.
- A scientific research thesis of 30 credit hours represent a main component of the program. It is achieved in a subject assigned by the supervision committee, endorsed by the Department Council, the committee of graduate studies & research and the Faculty Council.
- The student should publish at least one scientific research paper in scientific journals before the public defense of the Thesis..

4c. Program Components

1- Courses according to the By-law

Code number	Name of the course	Type	Credit Hours	Semester
(GCM-201)	<i>Instrumental Analysis</i>	General Compulsory	2	Fall
(GCM-202)	<i>Statistics and biostatistics</i>	General Compulsory	2	Fall
(GCM-203)	<i>Physical chemistry</i>	General Compulsory	1	Fall
(GCM-204)	<i>Bioinformatics</i>	General Compulsory	1	Fall
(GCM-205)	<i>Research Methodology & Ethics</i>	General Compulsory	1	Fall
(GCM-206)	<i>Scientific writing and Seminar</i>	General Compulsory	1	Fall
(PGM-201)	<i>Modern applications of chromatographic analysis for natural products</i>	Special Compulsory	2	Spring
(PGM-202)	<i>Applications of advanced spectroscopic techniques</i>	Special Compulsory	2	Spring
(PGM-204)	<i>Herbal remedies</i>	Special Compulsory	2	Spring
(PGM-203)	<i>Bench-top biological assay (E)</i>	elective	2	Spring
(PGM-205)	<i>Aromatherapy (E)</i>	elective	2	Spring
Total (Courses)			16	
	Thesis		30	
Total			46	



2- Achievement of Program Intended Learning Outcomes via the courses

Course	C.H/ week	Program ILOs (by No.)			
		K.U*	IS**	P.P.S***	G.T.S****
First Semester - <i>General Courses (8 C.H.)</i>					
<i>Instrumental Analysis (GCM-201)</i>	2	A1	B1, B5, B11	C1, C2	D1, D3, D4
<i>Statistics and biostatistics (GCM-202)</i>	2	A1	B1, B5, B11	C1	D1, D2, D3, D5
<i>Physical chemistry (GCM-203)</i>	1	A1	B1, B5, B11	C1, C2	D1, D3, D6
<i>Bioinformatics (GCM-204)</i>	1	A1	B1, B5, B11	C1	D1, D3
<i>Research Methodology & Ethics (GCM-205)</i>	1	A5	B1, B5, B11	C1, C2	D1, D3, D5, D8
<i>Scientific writing and Seminar (GCM-206)</i>	1	A7	B1, B5, B11	C1, C2	D1, D3, D5
Total	8				
Second Semester - <i>Special Courses (8 C.H.)</i>					
<i>Modern applications of chromatographic analysis for natural products (PGM-201)</i>	2	A3, A4, A6	B2, B4, B11	C1, C2, C4	D1, D3, D6
<i>Applications of advanced spectroscopic techniques (PGM-202)</i>	2	A3, A6, A9	B3, B5, B7	C1, C4	D2, D3, D4
<i>Herbal remedies (PGM-204)</i>	2	A2, A4, A5, A8	B2, B6	C3, C4	D1, D2, D3
<i>Bench-top biological assay (PGM-203) (elective)</i>	2(E)	A2, A4, A7	B5, B6, B9, B11	C2, C4	D1, D2, D3
<i>Aromatherapy (PGM-205) (elective)</i>	2(E)	A2, A4, A5	B2, B6	C3, C4	D1, D2, D3
Total	8				
Thesis	30	A3, A4, A5, A6, A7, A9	B3, B4, B5, B6, B7, B8, B9, B10	C1, C2, C4, C5, C6, C7	D1, D2, D3, D4, D5, D6, D7, D8
Total	46				

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



Code	Course title	K.U*										IS**									
		A1	A2	A3	A4	A5	A6	A7	A8	A9	B1	B2	B3	B4	B5	B6	B7	B9	B11		
(GCM-201)	Instrumental Analysis	√									√				√				√		
(GCM-202)	Statistics and biostatistics	√									√				√				√		
(GCM-203)	Physical chemistry	√									√				√				√		
(GCM-204)	Bioinformatics	√									√				√				√		
(GCM-205)	Research Methodology & Ethics					√					√				√				√		
(GCM-206)	Scientific writing and Seminar							√			√				√				√		
(PGM-201)	Modern applications of chromatographic analysis for natural products			√	√		√				√	√		√					√		
(PGM-202)	Applications of advanced spectroscopic techniques			√			√				√		√		√				√		
(PGM-204)	Herbal remedies		√		√	√			√		√	√		√					√		
(PGM-203)	Bench-top biological assay (E)		√		√			√			√			√	√			√	√		
(PGM-205)	Aromatherapy (E)		√		√	√					√	√		√	√				√		

* Knowledge and Understanding

** Intellectual Skills

E Elective course



Code	Course title	P.P.S***				G.T.S****								
		C1	C2	C3	C4	D1	D2	D3	D4	D5	D6	D8		
(GCM-201)	Instrumental Analysis	√	√			√		√	√					
(GCM-202)	Statistics and biostatistics	√				√	√	√		√				
(GCM-203)	Physical chemistry	√	√			√		√		√		√		
(GCM-204)	Bioinformatics	√				√		√		√				√
(GCM-205)	Research Methodology & Ethics	√	√			√		√		√		√		
(GCM-206)	Scientific writing and Seminar	√	√			√		√		√		√		
(PGM-201)	Modern applications of chromatographic analysis for natural products	√	√		√	√		√				√		
(PGM-202)	Applications of advanced spectroscopic techniques	√			√		√	√		√				
(PGM-204)	Herbal remedies			√	√	√	√	√		√				
(PGM-203)	Bench-top biological assay (E)		√		√	√	√	√		√				
(PGM-205)	Aromatherapy (E)			√	√	√	√	√		√				

Professional and Practical Skills

General and Transferable Skills
E Elective course



5- Student Assessment Methods

6.1- Written exam (general and special courses).	To assess Knowledge and Understanding and Intellectual Skills
6.2- Oral exam (general and special courses).	To assess Knowledge and Understanding, Intellectual Skills and General and transferable Skills
6.3- Scientific seminar for thesis registration	To assess Knowledge and Understanding, Intellectual Skills and General and transferable Skills
6.4- Published scientific research paper.	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills
6.5- Thesis writing	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and Transferable Skills
6.5- Public presentation and discussion of the thesis.	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and Transferable Skills

6- Program Admission Requirements

- 7.1- The candidate should hold a bachelor degree in pharmacy from any faculty of pharmacy from Egypt or Arabian countries or foreign universities recognized by the Supreme Council of Universities recognized by the Supreme Council of Universities with minimum general grade of "Good". Candidates having Diploma in the area of specialty are preferred. It is possible to enroll foreign students with general grade "Good".
- 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 possess at least grade "Good" in the subject of the specialty.
- 7.4- The department council starts the registration process for the candidate after his/her successful passing of the general courses of the first semester.
- 7.5- The candidate should follow postgraduate rules of by-law (2014) and its modified by-law (2017) of Faculty of Pharmacy-Mansoura University.

7- Regulations for progression and program completion

- 8.1- The minimum duration of time to gain the master degree is two years from the date of enrollment or 18 months from the date of registration of the master thesis.
- 8.2- The maximum duration of time to gain the master degree is 5 years from the date of registration, putting in consideration the periods of enrollment suspension. It is possible to extend this period up to two years (one year at a time) based on a request from the candidate's



major supervisor, a suggestion from the department council and the committee of graduate studies & research and the approval of the faculty council. The final decision should be endorsed by the university council of graduate studies & research.

- 8.3- The student has to pass the assigned courses, and to practically do a scientific research thesis for complete fulfilment of the master degree.
- 8.4- An annual progress report is presented by the supervisors of thesis to the Dept Council by December.
- 8.5- The candidate should follow postgraduate rules of by-law (2014) and its modified by-law (2017) of Faculty of Pharmacy-Mansoura University.

8- Facilities Required for Search:

- 9.1- Computers.
- 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 natural products.

9-Thesis

A thesis should be prepared by the student for complete fulfillment of the master degree.

10- 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
Supervisors of Thesis	Reports	Reports of staff members of committee to evaluate the thesis

Program Coordinator:

Head of Department: Prof. Dr. Mona G. Zaghloul

Signature:

Annex 1

Attach courses specifications.



Program: Master in Pharmaceutical Sciences
(Pharmacognosy)

Pharmacognosy Department



Pharmacognosy Thesis Specification

Academic Year: 2021/2022

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A-Basic Information

1	Faculty	Pharmacy
2	Program Title:	Master thesis in pharmacognosy
3	Program Type:	Single
4	Department (s):	Pharmacognosy Department
	Total credits of the Thesis	30 C. H.
	Total credits of the Program	46 C.H.
5	Final award of the Program:	degree of Pharmaceutical Sciences (Pharmacognosy)
6	Coordinator:	Prof Dr. Mona Zaghloul
7	External Evaluator(s):	Prof. Dr. Maged Abo Hashem
8	Date of Program Specification Approval:	<i>Department council: 11/5/2022,</i> <i>Faculty council:</i>

B-Professional Information

1-Aims

The overall aims of the thesis:

Upon successful completion of this course, the students should be able to:

- 1.1 a scientific protocol designed to solve problem using suitable knowledge in pharmacognosy.
- 1.2 Demonstrate different techniques and methods used in the experimental work according to the designed protocol
- 1.3 present the results of the study from the data collected
- 1.4 Analyze the results of the study according to other studies in the same point.
- 1.5 Drive conclusions of research finding.

2-Intended Learning Outcomes (ILOs)

a- Knowledge and Understanding:



Upon successful completion of the thesis, the graduate should be able to efficiently demonstrate the essential knowledge and understanding of:

a1	Demonstrate the fundamentals and advanced pharmacognosy knowledge within the specified point of research.
a2	Determine the suitable methods, tools and techniques needed to perform the research
a3	Conserving legal and ethical guidelines during all steps of work.
a4	Define and apply quality bases during practical work.
a5	Identify the impact of the research on community and human health.

b- Intellectual Skills

By the end of this thesis, the graduate should be able to:

b1	Interpret and evaluate the suitability, accuracy, and reliability of information obtained from the thesis.
b2	Propose a solution to the point understudy depending on available data.
b3	Carry out the researches that improve the knowledge of natural product.
b4	Develop writing skills such as clarity and presenting results to formulate scientific papers.
b5	Develop writing skills such as clarity and presenting results to formulate scientific papers.

c- Professional and Practical Skills

By the end of this thesis, the graduate should be able to:

c1	Perform practical experiments related to the point understudy
c2	Report the work in a written thesis and formulate scientific papers.
c3	Asses used methods, tools and instruments in natural product research.
c4	Consider developments in technology and how to use to enhance learning.
c5	Enhance practical work performance through increasing the accuracy and precision of the work.

d. General and Transferable Skills

By the end of this thesis, the graduate should be able to:



d1	Communicate effectively by verbal and written means.
d2	Be competent in the use of computers for data analysis, word processing, and production of thesis-quality graphics.
d3	Evaluate the performance of others and assist them to develop.
d4	Recognize self-limitations and areas for improvement and seek for continuous learning.
d5	Gather, summarize, and organize information from different sources.
d6	Implement tasks as a member of a team.
d7	Utilize time effectively to achieve goals

3- Thesis Contents:

Part	Topics
1	Abstract (Arabic and English)
2	Introduction
3	Aims, Objectives and Rational of the work
4	Results and Discussion, covering all fields
5	Methodology and Experimental Work of all fields
6	Conclusion
7	References

4- Matrix of knowledge and skills of the Thesis:

Part	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
2	Introduction	a1,	b3	c2, c3	d1, d2, d3,d4
3	Objectives/Rational	a3	b1, b2, b3	c1, c4	d1, d2, d3,d4
4	Results and Discussion	a1, a2, a3	b1, b2, b4, b5	c2	d1, d2, d3,d4
5	Experimental Work	a2	b1	c1, c2, c3, c5	d1, d2, d3,d6, d7
6	Conclusion	a1, a2, a5	b3	c3	d1, d2, d3

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

5. Student Assessment:



A written Thesis	
Published Research Paper(s)	
Public Defense	
Committee-in-Charge Report	
Dept Council Approval	

Guidelines of the Thesis (according to By-Law).

- 1- The minimum period for obtaining a PhD is two years from the date of approval of the University's Graduate Studies Council for registration.
- 2- The maximum limit for obtaining a doctoral degree is five years from the date of registration, taking into account cases of suspension of registration, and registration may be extended upon the request of supervisors and the approval of the relevant department council, the Graduate Studies and Research Committee, and the College Board for an academic year with a maximum of two years.
- 3- The student must pass the English Language Examination with the minimum score specified by the University Studies Board to approve the PhD defense date.
- 4- The total number of credit hours for obtaining a doctoral degree is 50 credit hours (8 course hours, 42 credit hours per thesis).
- 5- The student conducts a research on a topic determined by the supervisory committee and approved by the relevant department council and the college, graduate studies and research councils.
- 6- The researcher submits, before registering for the academic degree, the research plan in a public discussion in the department to discuss the topic of the thesis, determine the objectives of the research, the extent of its application, potential problems and how to overcome them.
- 7- After the approval of the Graduate Studies and Research Committee and the College Board, the scientific departments develop specialized courses from code (300) whose number of credit hours does not exceed 8 hours, and their average points are not less than 2.00, and these hours are calculated within the hours prescribed for the program.
- 8- The scientific thesis is the responsibility of the relevant department council and is accomplished scientifically and technically under the responsibility of the supervisory committee. Scientific, technical and administrative support must be provided to the researcher for its completion, and the supervision committee is formed as follows:
- 9- The College Council, upon the proposal of the relevant Department Council, appoints a professor who supervises the thesis (principal supervisor). The council may entrust the supervision of the thesis to one of the assistant professors.
- 10- It is permissible for the supervisors to be many professors or assistant professors, and teachers may participate with a maximum of one in the same specialty.
- 11- A member from abroad who has experience in the specialty to which the dissertation belongs may be joined to the supervision committee.



Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
Master Thesis Specification
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Postgraduate Studies



12- The student should meet his main supervisor at least once monthly and a semi-annual report must be provided by the supervisor(s) on the progress of student to the department council and the Graduate Studies Committee and the graduate should be given a copy of the report. The annual report must be submitted to the college council in October each year.

13- A postgraduate student registered to obtain a master's degree or a doctorate degree, after completing the thesis preparation, holds a public discussion session on the thesis summary and the results he reached, during which the supervisors determine the extent to which the student fulfills the research point before submitting the thesis to the department council.

14- The principal supervisor submits an application that includes a proposal to form a discussion committee and judge the thesis after preparing it and preparing it for discussion in preparation for presentation to the Postgraduate Studies and Research Committee and then the College Board for approval and is supported by the following:

15- The report on the validity of the dissertation for discussion, signed by the majority of the members of the supervisory committee, one of whom is the main supervisor.

16- A copy of the thesis prepared according to the instructions for writing scientific theses in the faculty.

17- At least one research published in a scientific refereed journal.

18- The committee for discussion and judgment on the dissertation is formed of three members based on the proposal of the relevant department council, the graduate studies and research committee, and the approval of the college council, one of whom is the main supervisor or two members with one vote. And two other members from among the professors or assistant professors, at least one of them is from outside the college for master's theses, and at least one of them is from outside the University for Doctoral Theses (the two are from outside the college) according to the text of Article 153 of the Universities Organization Law.

19- The department council approves the individual reports, the group report, and what indicates that the student has made the proposed amendments from the discussion and judgment committee and submitted them to the Graduate Studies and Research Committee and the College Board in preparation for presentation to the University Council.

20- The date of awarding the academic degree is the date on which the University Council approved the College Board's recommendation for grants.

21- The college council, based on the proposal of the discussion and judgment committee, may return the message to the student to correct the errors and complete what the committee deems short of or submit another message in case the thesis is rejected.

6 – Facilities Required:



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Laboratory	Chemicals, apparatus and advanced instruments
Library	Scientific books and journals
Others	

Thesis Coordinator	Head of Department	Date
Prof. Dr.	Prof Dr. Mona Zaghoul

* Date of Dept. Council Approval



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master Program
Modern applications of
chromatographic analyses for natural
products Course Specification
2021/2022



Dept. of Pharmacognosy	Course Specification	Master
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Pharmacognosy Master
Course Specification
Academic year: 2021/2022

البرنامج
ماجستير

توصيف مقرر
التطبيقات الحديثة لطرق التحليل
الكروماتوجرافي للنواتج الطبيعية
Modern applications of
chromatographic analyses for
natural products

رئيس القسم
أ.د. منى جودة زغلول

منسق المقرر
أ.د. أحمد محمد زغلول



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master Program
Modern applications of
chromatographic analyses for natural
products Course Specification
2021/2022



General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacognosy
Department supervising the course	Pharmacognosy
Program on which the course is given	Master degree of Pharmacognosy PGM- 200
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	11/5/2022

A. Basic Information : Course data :

Course Title	Modern applications of chromatographic analyses for natural products.
Course Code	PGM-201
Prerequisite	-----
Teaching Hours: Lecture	2
Practical:	-----
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

- 1- Mastering of advanced knowledge, professional research skills, attitudes and values in the field of chromatography and integrating with the relevant subjects in his/her professional practice.
- 2- Applying the basics and methodologies of scientific research and manipulating its various tools in the field of chromatographic analysis.
- 3- Mastering of all traditional and new techniques used in the field of chromatography.
- 4- Writing a thesis that involves extensive writing literature surveys and laboratory based practical work in the field of natural products.

2- Intended Learning Outcomes (ILOs)

2.1. Knowledge and Understanding

After completion of the course, graduates will be able to

(A3)	a1	Outline the current problems, the recent and advanced scientific development in the field of chromatographic analysis.
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(A4)	a2	Define principles and fundamentals of the quality professional practice in the field of natural products.
(A6)	a3	Identify the methods and techniques used for isolation, identification of natural products.

2.2. Intellectual Skills

After completion of the course, graduates will be able to

(B2)	b1	Investigate and evaluate the information in the field of bio-assay screening, herbal remedies and aromatherapy.
(B4)	b2	Evaluate the capability of choosing and validating the appropriate chromatographic separation technique.
(B11)	b3	Generate professional decisions in a variety of professional contexts.

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

(C1)	c1	Apply different research methodologies and good experimental and reporting skills in the separation of the naturally occurring compounds.
(C2)	c2	Conduct safely and efficiently advanced technological research tools and equipment relevant to separation and biological screening of natural products.
(C4)	c3	Utilize scientific research and contribute to the knowledge in the field pharmacognosy and phytochemistry.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

(D1)	d1	Communicate effectively by verbal and written means.
(D3)	d2	Develop self- assessment and identifying personal educational needs.
(D6)	d3	Work effectively in a team and leading teams.

3. Course Contents

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1.	Introduction to chromatography, Chromatographic terms and Classification of chromatography	4	0
2.	Column chromatography and Reversed Phase	4	0

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3.	Bonded phase, Diol, and Reversed Phase	2	0
4.	Ion exchange chromatography and Size exclusion chromatography	2	0
5.	Separation techniques and quantitative analysis using TLC	2	0
6.	Separation techniques using paper chromatography (PC)	2	0
7.	GC	4	0
8.	HPLC	4	0
Total:		24 hr	0

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 chromatography, Chromatographic terms and Classification of chromatography	a1, a3	b1, b2	c1	d1
2	Column chromatography	a1, a2, a3	b1, b2	c1	d1
3	Bonded phase, Diol, and Reversed Phase	a1, a2, a3	b1, b2	c1	d1
4	Ion exchange chromatography and Size exclusion chromatography	a1, a2, a3	b1, b2	c1	d1
5	Separation techniques and quantitative analysis using TLC	a1, a2, a3	b1, b2, b3	c1, c2, c3	d1, d2, d3
6	Separation techniques using paper chromatography (PC)	a1, a2, a3	b1, b2, b3	c1, c2, c3	d1, d2, d3
7	GC	a1, a2, a3	b1, b2, b3	c1, c2, c3	d1, d2, d3
8	HPLC	a1, a2, a3	b1, b2, b3	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	Lectures using whiteboard
5.3	Video-recorded lectures, uploaded to the University Portal for Online learning

Course Specifications of: (Modern applications of chromatographic analyses for natural products)



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5.4	Activities and tasks required to develop students' self-learning skills.
5.5	Tutorial, Class Activity and Group Discussion to explain what has not been understood
5.6	Interactive Sessions using Microsoft Teams
5.7	Internet search and Research Assignments to design Formative Assignments

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.	Elke Hahn-Deinstrop, Applied Thin-Layer Chromatography-Best Practice and Avoidance of Mistakes, 2nd ed., WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, 2006.	Essential Book (Text Books)
2.	W.J. LOUGH and I.w. WAINER, High performance liquid chromatography, Fundamental Principles and practice, BLACKIE ACADEMIC & PROFESSIONAL, 2009	Recommended Book (electronic Books)

8- Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
- Library	Books

9. Signature

Course Coordinator	Head of Department	Date*
Prof. Dr. Ahmed Mohamed Zaghloul	Prof Dr. Mona G. Zaghloul

* Date of faculty Council Approval



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master Program
Application of advanced spectroscopic
techniques Course Specification
2021/2022



Dept. of Pharmacognosy	Course Specification	Master
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Pharmacognosy Master
Course Specification
Academic year: 2021/2022

البرنامج
ماجستير

توصيف مقرر
تطبيقات لطرق التحليل الطيفي المتقدمة
Application of advanced
spectroscopic techniques

رئيس القسم
أ.د. منى جودة زغلول

منسق المقرر
د. يحيى أمين



Mansoura University
Faculty of Pharmacy
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Master Program
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techniques Course Specification
2021/2022



General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacognosy
Department supervising the course	Pharmacognosy
Program on which the course is given	Master degree of Pharmacognosy PGM- 200
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	11/5/2022

A. Basic Information : Course data :

Course Title	Application of advanced spectroscopic techniques
Course Code	PGM-202
Prerequisite	-----
Teaching Hours: Lecture	2
Practical:	-----
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

The course helps the student gain an understanding of the principle of the different spectroscopic methods of analysis such as: Visible, Ultraviolet, Infrared, Nuclear Magnetic Resonance and Mass Spectroscopy. The course also provides the students with a detailed exposure to the applied aspects of these spectroscopic techniques in structure-elucidation of the natural products. Moreover, the course enables the students to interpret 2-dimensional NMR spectra of organic molecules and to identify natural products structures from their NMR spectra. By the end of the course the students will be able to solve and work-out the structure of unknown natural products using a combination of UV, IR, ¹H-NMR, ¹³C-NMR, 2D-NMR and Mass spectroscopy.

2- Intended Learning Outcomes (ILOs)

2.1. Knowledge and Understanding

After completion of the course, graduates will be able to



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(A3)	a1	Describe the current problems, the recent and advanced scientific development in the field of spectroscopy.
(A6)	a2	Identify the methods and techniques used for structural elucidation of natural products
(A9)	a3	Find the appropriate types of data needed to tackle a certain research problem

2.2. Intellectual Skills

After completion of the course, graduates will be able to

(B3)	b1	Solve problems about the structural elucidation of natural products based on the available spectroscopic data.
(B5)	b2	Combine various professional knowledge to solve problems.
(B7)	b3	Interpret and validate the obtained research data

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

(C1)	c1	Employ different research methodologies and good experimental and reporting skills in the structural elucidation of natural products.
(C4)	c2	Conduct scientific research and contribute to the knowledge in the field pharmacognosy and phytochemistry.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

(D2)	d1	Use computer program, online database, software and other IT to get information and analyze the obtained research data.
(D3)	d2	Develop critical thinking, problem-solving and decision-making capabilities
(D4)	d3	Develop self- assessment and identifying personal educational needs.

3. Course Contents

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1	Ultraviolet and Visible Spectroscopy	4	0
2	Infra-red Spectroscopy	2	0
3	Mass Spectrometry	2	0



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4	1H NMR Spectroscopy	6	0
5	13C-NMR, DEPT, APT	2	0
6	2D-NMR Spectroscopy (COSY, HSQC, HMBC, 2D-NOESY=ROESY)	4	0
7	Application to NMR spectroscopy: Class problems	4	
Total:		24	0

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	Ultraviolet and Visible Spectroscopy	a1, a2, a3	b1, b2, b3	c1, c2	d1
2	Infra-red Spectroscopy	a1, a2	b1, b2, b3	c1, c2	d1, d2, d3
3	Mass Spectrometry	a1, a2	b1	c1, c2	d1, d2, d3
4	1H NMR Spectroscopy	a1, a2, a3	b1, b2, b3	c1, c2	d1, d2, d3
5	13C-NMR, DEPT, APT	a1, a2, a3	b1, b2, b3	c1, c2	d1, d2, d3
6	2D-NMR Spectroscopy (COSY, HSQC, HMBC, 2D-NOESY= ROESY)	a1, a2, a3	b1, b2, b3	c1, c2	d1, d2, d3
7	Application to NMR spectroscopy: Class problems	a1	b2, b3	c1, c2	d1, 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	Lectures using whiteboard
5.3	Video-recorded lectures, uploaded to the University Portal for Online learning
5.4	Activities and tasks required to develop students' self-learning skills.
5.5	Tutorial, Class Activity and Group Discussion to explain what has not been understood
5.6	Interactive Sessions using Microsoft Teams
5.7	Internet search and Research Assignments to design Formative Assignments



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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.	Spectroscopic identification of organic compounds, Robert M. Silverstein, Francis X. Webster and David J. Kiemle 7 th (2009).	Essential Book (Text Books)
2.	Modern NMR spectroscopy, Sanders, J.K.M., Hunter, B.K.; Oxford: New York, 2003	Recommended Book (electronic Books)
3	http://www.chemistry.ccsu.edu/glagovich/teaching/472/uvvis/uvvis.html http://www.chem.csustan.edu/Tutorials/INFRARED.HTM http://www.science.widener.edu/svb/nmr/nmr.html http://www.chipo.chem.uic.edu/web1/ocol/spec/MS.htm	Websites

8- Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
- Library	supplied by recent scientific books and journals.

9. Signature

Course Coordinator	Head of Department	Date*
Dr. Yhiya Amen	Prof Dr. Mona G. Zaghloul

* Date of faculty Council Approval



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master Program
Herbal remedies Course Specification
2021/2022



Dept. of Pharmacognosy	Course Specification	Master
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Pharmacognosy Master
Course Specification
Academic year: 2021/2022

البرنامج
ماجستير

توصيف مقرر
الأدوية العشبية
Herbal remedies

رئيس القسم
أ.د. منى جودة زغلول

منسق المقرر
أ.د. أشرف طه خليل



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master Program
Herbal remedies Course Specification
2021/2022



General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacognosy
Department supervising the course	Pharmacognosy
Program on which the course is given	Master degree of Pharmacognosy PGM- 200
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	11/5/2022

A. Basic Information : Course data :

Course Title	Herbal remedies
Course Code	PGM-204
Prerequisite	-----
Teaching Hours: Lecture	2
Practical:	-----
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

How to use medicinal herbs in treatment of different disease, evaluation & classification of herbs and doses

2- Intended Learning Outcomes (ILOs)

2.1. Knowledge and Understanding

After completion of the course, graduates will be able to

(A2)	a1	Identify the theories and fundamentals of bioassay-screening, herbal remedies.
(A4)	a2	Identify the regulatory prospective for the assessment for quality, safety and efficacy of herbal medicine in health care.
(A5)	a3	Distinguish the basics and ethics of scientific research in the area of natural drugs
(A8)	a4	Identify the regulatory prospective for herbal medicine in health



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2.2. Intellectual Skills

After completion of the course, graduates will be able to

(B2)	b1	Analyze and evaluate the information in the field of bio-assay screening, herbal remedies
(B6)	b2	Write a systematic scientific study about the research problems in the field of herbal medicine and natural products.

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

(C3)	c1	Apply efficiently herbal medicine as a supportive treatment in various diseases
(C4)	c2	Carry out scientific research and contribute to the knowledge in the field pharmacognosy and phytochemistry.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

(D1)	d1	Communicate effectively by verbal and written means
(D2)	d2	Manipulate computer program, online database, software and other IT to get information and analyze the obtained research data.
(D3)	d3	Perform self- assessment and identifying personal educational needs.

3. Course Contents

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1	Introduction to herbal medicine	6	0
2	Safety measurements of herbs	6	0
3	Therapeutic activities	4	0
4	Diseases and herbal treatments	4	0
5	Toxicity of herbal medicine	4	0
Total:		24	0



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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 herbal medicine	A2	B2, B6	C3, C4	D2, D3
2	Safety measurements of herbs	A2, A4, A5	B2, B6	C3, C4	D3
3	Therapeutic activities	A5, A8	B2, B6	C3, C4	-
4	Diseases and herbal treatments	A5, A8	B2, B6	C3, C4	D3
5	Toxicity of herbal medicine	A4, A5, A8	B2, B6	C3, C4	D1

* 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
5.3	Video-recorded lectures , uploaded to the University Portal for Online learning
5.4	Activities and tasks required to develop students' self-learning skills.
5.5	Tutorial, Class Activity and Group Discussion to explain what has not been understood
5.6	Interactive Sessions using Microsoft Teams
5.7	Internet search and Research Assignments to design Formative Assignments

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 %



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7- List of References

	Reference	Type
1	Herbal medicine , Phytotherapy.. https://medlineplus.gov/herbalmedicine.html	Course notes
2	-Herbal Remedies: A Quick and Easy Guide to Common Disorders and Their Herbal Treatments... By Asa Hershoff (2002)	Essential Book (Text Books)
3	-Herbal Remedies A – Z: Your complete guide to natural health and beauty By Infinite Ideas, Barbara Griggs (2009)	Recommended Book (electronic Books)

8- Facilities required for teaching and learning

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

9. Signature

Course Coordinator	Head of Department	Date*
Prof. Dr. Ashraf Taha Khalil	Prof Dr. Mona G.Zaghloul

* Date of faculty Council Approval



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master Program
Alternative Medicine &
Aromatherapy Course Specification
2021/2022



Dept. of Pharmacognosy	Course Specification	Master
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Pharmacognosy Master
Course Specification
Academic year: 2021/2022

البرنامج
ماجستير

توصيف مقرر
العلاج بالأدوية التكميلية و البديلة و
المواد العطرية
Alternative Medicine &
Aromatherapy

رئيس القسم
أ.د. منى جودة زغلول

منسق المقرر
أ.د. فريد عبد الرحيم بدرية



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master Program
Alternative Medicine &
Aromatherapy Course Specification
2021/2022



General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacognosy
Department supervising the course	Pharmacognosy
Program on which the course is given	Master degree of Pharmacognosy PGM- 200
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	11/5/2022

A. Basic Information : Course data :

Course Title	Alternative Medicine & Aromatherapy
Course Code	PGM-205
Prerequisite	-----
Teaching Hours: Lecture	2
Practical:	-----
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

- Provide the student with the basic information about aromatherapy
- Define the principle of preparation, safety and testing the quality of essential oils
- Help the student gain an understanding of the therapeutic properties of essential oils and their effective application
- Recognize other Alternative Medicine modalities that augment the therapeutic activities of Aromatherapy especially in relieving stress and achieve hormonal balance and well being.

2- Intended Learning Outcomes (ILOs)

2.1. Knowledge and Understanding

After completion of the course, graduates will be able to

(A2)	a1	Identify the theories and fundamentals of bioassay-screening and aromatherapy.
(A4)	a2	Identify principles and fundamentals of the quality professional practice in the field of natural products.



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(A5)	a3	Distinguish the basics and ethics of scientific research in the area of natural drugs.
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2.2. Intellectual Skills

After completion of the course, graduates will be able to

(B2)	b1	Analyze the different physical and chemical characters of essential oils.
(B6)	b2	Analyze and evaluate the information in the field of bio-assay screening, herbal remedies and aromatherapy.

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

(C3)	c1	Carry out scientific research and contribute to the knowledge in the field of pharmacognosy phytochemistry, and alternative medicine.
(C4)	c2	Apply efficiently aromatherapy and herbal medicine as a supportive treatment in various diseases.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

(D1)	d1	Communicate effectively by verbal and written means.
(D2)	d2	Manipulate computer program, online database, software and other IT to get information and analyze the obtained research data.
(D3)	d3	Perform self- assessment and identifying personal educational needs.

3. Course Contents

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1	Significance and main characteristics of alternative/integrative medicine	2	0
2	Methods to relieve stress and relaxation	4	0
3	Aromatherapy in Chinese and Ayurveda medicine	2	0
4	Introduction to aromatherapy	4	0
5	Safety guidelines	2	0
6	Specific hazards	2	0



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7	Therapeutic properties of essential oils	4	
8	Effective application	4	
Total:		24	0

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	Ultraviolet and Visible Spectroscopy	A2	-	C4	D3
2	Infra-red Spectroscopy	A2, A4, A5	B6	C3, C4	D3
3	Mass Spectrometry	A4, A5	B2, B6	C3	D3
4	¹ H NMR Spectroscopy	A5	B2, B6	-	D3
5	¹³ C-NMR, DEPT, APT	A2, A5	B2	-	D1, D2, D3
6	2D-NMR Spectroscopy (COSY, HSQC, HMBC, 2D-NOESY= ROESY)	A5	B2, B6	C3, C4	D1, D2, D3
7	Application to NMR spectroscopy: Class prpbles	A4	-	C3, C4	D2

* 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
5.3	Video-recorded lectures , uploaded to the University Portal for Online learning
5.4	Activities and tasks required to develop students' self-learning skills.
5.5	Tutorial, Class Activity and Group Discussion to explain what has not been understood
5.6	Interactive Sessions using Microsoft Teams
5.7	Internet search and Research Assignments to design Formative Assignments

6- Student Assessment:

	Assessment Methods		Assessment Schedule	Weighing of Assessments
Assessment 1	Written Exam (Final)	Paper exams that are corrected electronically and/or manually.	week 15	90



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		To assess understanding, intellectual, professional skills		
Assessment 2	Oral Exam	To assess understanding, intellectual skills, General and Transferable skills	week 15	10
				100 %

7- List of References

	Reference	Type
1.	Brief lecture notes	Course notes
2.	Aromatherapy for health professionals, Shirly price and Len price, 2007	Essential Book (Text Books)
3.	-Complementary Therapies for the Body, Mind and Soul, Marcelo Saad, InTech Pub., 2015. -Chemistry and technology of flavours and fragrans, Davide Rawe, 2005	Recommended Book (electronic Books)
4	http://www.chemistry.ccsu.edu/glagovich/teaching/472/uvvis/uvvis.html http://www.liebertpub.com/overview/journal-of-alternative-and-complementary-med http://www.science.widener.edu/svb/nmr/nmr.html http://www.chipo.chem.uic.edu/web1/ocol/spec/MS.htm	Websites

8- Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
- Library	supplied by recent scientific books and journals.

9. Signature

Course Coordinator	Head of Department	Date*
Prof. Dr. Farid Abdelrehim Badria	Prof Dr. Mona G.Zaghloul

* Date of faculty Council Approval