

Program SPECIFICATION FOR Master Degree in Histochemistry & Cell Biology

Code: 1709700

University: Alexandria

Faculty: Medical Research Institute

Program Specification

A- Basic information

1- Program title : Master Degree in Histochemistry & Cell Biology

2- Program type: single double multiple

3- Department(s): Histochemistry & Cell Biology

4- Coordinator: Dr. Mohammed Salama

5- External evaluator(s): Prof.Dr. Ismail Sadek

6- Last date of program specification approval: 5/6/2014

B- Professional Information

1- Program aims:

The programme is designed to produce scientifically and professionally capable candidates to meet regional and national needs, by the end of this program the student should:

- 1-be provided with knowledge, skills, and critical awareness to make a significant contribution to research.
- 2- Use available tools and stains to detect cellular disorders by histochemistry and immunohistochemistry.
- 3- recognize basic principles of techniques and basic knowledge.
- 4- Evaluate and judge scientific papers.
- 5- explore how research comes out.
- 6- Communicate effectively through oral presentations.
- 7- Establish work relationships with colleagues and work effectively as a part of a team.

8. Use systematic approaches to design and conduct scientific research.
9. Plan and implement enhancement and improvement approaches to practice.
10. Appraise the majority of problems according to the available data and take a decision in various professional situations.
11. Competent in all basic and all acquired advanced professional skills, write and appraise reports and improve methods and tools used in specialty.
12. Take decisions in various professional situations (including dilemmas & controversial issues).
13. Harness the available resources to achieve the highest benefit efficiently.
14. Be cognizant of his role in community development.
15. Evaluate reflectively on their own learning process. Develop skills, in self-appraisal and seek continuous learning.

By the end of this programme the student should:

- 1- recognize the broad-based theoretical and practical of cell biology and histochemistry.
- 2- Manage common and less common/adequate problems.
- 3- Integrate information of specially and related subject to analyze and solve problems.
- 4- Competent in basic and some advanced procedures.
- 5- Able to conduct scientific research.

2- Intended learning outcomes (ILOS)

a- knowledge and understanding:

- a1- Define tissue processing and select the different instruments in the field.
- a2- List basic facts of cell biology and related subjects.
- a3 – Recognize the different histological structures of various organs.
- a4 – Repeat the function of different tissue organs.
- a5 – Arrange basic facts and theories of main scientific approaches in non-enzyme histochemistry.
- a6 – List the importance of enzymes like phosphatases, oxidases and dehydrogenases and their histochemical detection.
- a7- Recall know basic facts and theories of main scientific approaches in immunohistochemistry.
- a8- Recognize basic facts and theories of ultrahistochemistry.



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- a9- Memorize the use of laboratory animals in scientific research.
- a10- Define different cell disorders and their needed tests.
- a11-Design conduction & publishing of scientific research through thesis.
- a12-Employ ethical considerations in different types of scientific research through thesis.

b- Intellectual skills:

- b1- Appraise different histochemical staining under the light and electron microscopes.
- b2- Analyze main scientific advances in histochemistry.
- b3- Examine different models of carcinogenesis on experimental animals under guide of the chemical safety.
- b4- Use different statistical tests to analyze and interpret data.
- b5- Integrate different information to solve professional problems.
- b6- Evaluate the values of different histological lab techniques and the findings in different organs and tissues selected from animal and human biopsy.
- b7- Solve problems in management of histopathological parameter and take decisions in various professional situations on the basis of evidence and proof.
- b8- Plan for professional improvement of immunohistochemical staining using tumor markers.
- b9- Choose the problem of new or development drugs through demonstrating model of experimental animals.
- b10- Evaluate risks imposed during professional improvement.
- b11-add to the specialty field through creativity & innovation through seminars and thesis.
- b12-Write a thesis protocol using a scientific systematic approach to a research problem.

c- professional and practical skills:

- c1- Demonstrate the different uses of instruments in the field like balances, tissue processing and different kinds of microscopes.
- c2- Apply the available tools to detect cellular contents.
- c3- Demonstrate the histological features of different tissue organs.
- c4-Use different special histological staining and procedures.
- c5- Practice methods and tools used in different branches of histochemistry like proteins, enzymes, different cellular signaling and markers.
- c6- Demonstrate the different uses of laboratory animals, their anesthesia and anatomy.
- c7- Employ different tools to detect cell injuries.
- c8- Apply fundamentals of ethical and legal practice and ethics of scientific research.



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- c9- Write and appraise scientific and technical reports.
- c10- Use recent technology to develop professional and practical skills.
- c11- Evaluate and improve methods and tools used in specialty through student questionnaire.
- c12- professional development courses to improve practice and enhance performance of juniors through student questionnaire.

d- General and transferable skills:

- d1- Work effectively as a part of teamwork.
 - d2- Evaluate reflectively on their own learning process.
 - d3- Develop skills in observation and communications.
 - d4- share in determination of standards for evaluation of others
 - d5- manage time effectively,
 - d6- Use information technology to improve candidates' professional practice.
 - d7- Practice self appraisal.
 - d8- Use different sources of information to obtain data.
 - d9- Learn independently and seek continuous learning.
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3- Academic standards

3a External references for standards (Benchmarks)

Generic Academic Reference Standards of the National Authority for Quality Assurance and Accreditation of Education (NAQAAE)
adopted at MRI council 12/2/2014 and re-adopted at 15/1/2023

**Last date of Academic Reference standards (ARS) approval by Institute Council:
15/1/2023**

3b Comparison of provision to selected external references

Generic Academic Standards	ARS of MSC of Histochemistry and Cell Biology
A1-Basic facts, theories, of the specialty and related subjects/ fields.	a1- Define tissue processing and select the different instruments in the field. a2- List basic facts of cell biology and related subjects. a3 – Recognize the different histological structures of various organs. a4 – Repeat the function of different tissue organs.
A2- Mutual relation between professional practice and effects on environment	a5 – Arrange basic facts and theories of main scientific approaches in non-enzyme histochemistry. a6 –List the importance of enzymes like phosphatases, oxidases and dehydrogenases and their histochemical detection. a7 - Recall know basic facts and theories of main scientific approaches in immunohistochemistry.
A3- Recent advances in the field of practice	a8- Recognize basic facts and theories of ultrahistochemistry. a10- Define different cell disorders and their needed tests.
A4-Details of ethical & legal practice.	a9- Memorize the use of laboratory animals in scientific research. a12-Employ ethical considerations in different types of scientific research through thesis.
A5 -Quality standards of the practice	a5 – Arrange basic facts and theories of main scientific approaches in non-enzyme histochemistry. a7- Recall know basic facts and theories of main scientific approaches in immuohistochemistry.
A6- Design, conduction & publishing of scientific research	a11-Design conduction & publishing of scientific research through thesis.
A7- Ethical considerations in different types of scientific research .	a12-Employ ethical considerations in different types of scientific research through thesis.
B1- Analyze, deduce, extrapolate & evaluation of information.	b1- Appraise different histochemical staining under the light and electron microscopes. b2- Analyze main scientific advances in histochemistry. b3- Examine different models of carcinogenesis on experimental animals under guide of the chemical safety. b4- Compare different statistical tests to analyze and interpret data. b5- Integrate different information to solve professional problems. b6- Evaluate the values of different histological lab techniques

	and the findings in different organs and tissues selected from animal and human biopsy.
B2- Solve the majority of problems in the specialty according to the available data (complete or incomplete)	<p>b5 - Integrate different information to solve professional problems.</p> <p>b7- Solve problems in management of histopathological parameter and take decisions in various professional situations on the basis of evidence and proof.</p> <p>b9- Choose the problem of new or development drugs through demonstrating model of experimental animals.</p>
B3- Conduct research studies that add to the existing specialty knowledge	<p>b11 -add to the specialty field through creativity & innovation through seminars and thesis.</p> <p>b12 -Write a thesis protocol using a scientific systematic approach to a research problem.</p>
B4Conduct a scientific research &/Or write scientific systematic approach to a research problem (hypothesis)	<p>b12 -Write a thesis protocol using a scientific systematic approach to a research problem.</p>
B5- Plan and implement (or supervise implementation of) enhancement & Improvement approaches to practice .	<p>b8 - Plan for professional improvement of immunohistochemical staining using tumor markers.</p> <p>b10 - Evaluate risks imposed during professional improvement.</p>
B6- Take decisions in various professional situations (including dilemmas & controversial issues)	<p>b5 - Integrate different information to solve professional problems.</p> <p>b7 - Solve problems in management of histopathological parameter and take decisions in various professional situations on the basis of evidence and proofs.</p>
B7- Add to the specialty field through creativity & innovation	<p>b11-add to the specialty field through creativity & innovation through seminars and thesis.</p>
B8- Manage discussions on basis of evidence and proofs.	<p>b7 - Solve problems in management of histopathological parameter and take decisions in various professional situations on the basis of evidence and proofs.</p>
C1- Competent in all basic and all required advanced	<p>c1 - Demonstrate the different uses of instruments in the field like balances, tissue processing and different kinds of microscopes.</p>

<p>professional skills (to be determined according to the specialty board/ department)</p>	<p>c2 - Apply the available tools to detect cellular contents. c3 - Demonstrate the histological features of different tissue organs. c4 -Use different special histological staining and procedures. c5 - Practice methods and tools used in different branches of histochemistry like proteins, enzymes, different cellular signaling and markers. c6 - Demonstrate the different uses of laboratory animals, their anesthesia and anatomy. c7 - Employ different tools to detect cell injuries. c8 - Apply fundamentals of ethical and legal practice and ethics of scientific research.</p>
<p>C2- Write and appraise reports</p>	<p>c9- Write and appraise scientific and technical reports.</p>
<p>C3- Evaluate <i>and improve</i> methods and tools used in specialty</p>	<p>c11- Evaluate and improve methods and tools used in specialty through student questionnaire.</p>
<p>C4- Use technology to advance practice</p>	<p>c10- Use recent technology to develop professional and practical skills.</p>
<p>C5- Plan professional development courses to improve practice and enhance performance of juniors</p>	<p>c12- professional development courses to improve practice and enhance performance of juniors through student questionnaire.</p>
<p>D1- Communicate effectively using all methods.</p>	<p>d3- Develop skills in observation and communications. d5- Manage time effectively. d8- Use different sources of information to obtain data.</p>
<p>D2- Use information technology to improve his/her professional practice.</p>	<p>d5- Manage time effectively. d6- Use information technology to improve candidates' professional practice. d7- Practice self appraisal. d8- Use different sources of information to obtain data. d9- Learn independently and seek continuous learning.</p>

D3- Teach and evaluate others.	d1- Work effectively as a part of teamwork. d2- Evaluate reflectively on their own learning process. d4- Share in determination of standards for evaluation of others d7- Practice self appraisal. d8- Use different sources of information to obtain data. d9- Learn independently and seek continuous learning.
D4- Perform self appraisal & seek continuous learning.	d2- Evaluate reflectively on their own learning process. d7- Practice self appraisal. d9- Learn independently and seek continuous learning.
D5- Use different sources of information to obtain data	d3- Develop skills in observation and communications. d5- manage time effectively. d6- Use information technology to improve candidates' professional practice. d8- Use different sources of information to obtain data. d9- Learn independently and seek continuous learning.
D6- Work in teams as well as a member in larger teams	d1- Work effectively as a part of teamwork.
D7- Manage scientific meetings and appropriately utilize time	d5- Manage time effectively. d8- Use different sources of information to obtain data.

4- Curriculum structure and contents

4.a program duration: 3.5 years on average

4.b program structure :

4. b.i- No. of hours per week in each semester: 2 hours/week

Semester	Number of hours
First semester	7 hours
Second semester	7 hours
Third semester	8 hours
Fourth semester	8 hours

4.b.ii- No. of credit hours	Lectures	18	Practical	12	Thesis	8	Total	38
	Compulsory	24	Elective	6	Optional	0		

4.b.iii- No. of credit hours of specialized courses No. | %

4.b.iv- No. of credit hours of other courses No. | %

4.b.v- Practical/Field Training Yes No

4. b.vi- Program levels (in credit-hours system)

Student is required to pass at least 12 credit hours with CGPA not less than C+ before submitting a thesis proposal.

5- Program Courses

5.1- Compulsory (24 hrs)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1709701	Micro-Techniques I	3	2	2
1709702	Cell Biology I	3	2	2
1709703	General Histology I	3	2	2
1709704	Functional Histology I	3	2	2
1709705.1	Non-enzyme histochemistry I	2	1	2
1709705.2	Enzyme histochemistry I	2	1	2
1709705.3	Immunohistochemistry I	2	1	2
1709705.4	Ultrahistochemistry. I	2	1	2
1709706	laboratory animal science	2	1	2
1709707	Cell disorder I	2	2	0
		Total: 24	15	18

5.2- Elective I (6 hrs)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1701720	Biochemistry	2	1	2
1701721	Molecular Biology	2	1	2
1702704	Cancer chemistry ^l	2	2	0
1721721	Computer	2	1	2
1710720	Pathology	2	1	2

6- Program admission requirements

Graduate students with a M.B.Ch.B of Medicine, B.Sc. of Science, Veterinary, Pharmacy or Education (Biology Department).

7. Teaching and Learning Methods

Lecture, practical, brain storming, problem solving, self-directed learning, and e-learning

8- Regulations for progression and program completion

For the progression and completion of the program to obtain the degree of M.Sc, the student must:

- 1- Complete 30 credit hours with CGPA of at least C+ through courses.
- 2- Complete 8 credit hours with through thesis.
- 3- Submit a thesis validity report by an examination committee approved by the department council and their members include at least two external examiners.

9- Evaluation of Students enrolled in the program.

Tool evaluation	Intended learning outcomes being assessed
Written	ILOs a &b
Practical	ILOs c
Oral	ILOs a ,b &d
Semester Work	ILOs b & d

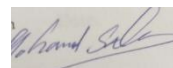
Evaluation of program intended learning outcomes

Evaluator	Tool	Sample
1- Senior students	questionnaire	50%
2- Alumni	questionnaire	Representative sample
3- Stakeholders (Employers)	meeting	Representative sample
4- External Evaluator(S) External Examiner (s)	Reports	External evaluator report Prof.Dr. Ismail Sadek
5- Other		

Program coordinator:

Name: Dr. Mohammed Salama.

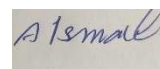
Signature:



Department Head:

Name: Abdel Azim Ahmed Ismail

Signature:



Date of Department Council Approval: 29/8/2023

Program Aims vs Graduate Attribute matrix

Generic Graduate Attributes of NAQAAE	Graduate Attributes of Master of Science in Histochemistry & Cell Biology	Program Aims
	By the end of this program, graduate should be able to	
Apply the basics and methodologies of scientific research and using its various tools proficiently.	<ul style="list-style-type: none"> -Making observations, forming a hypothesis, making a prediction, conducting an experiment and finally analyzing the results. -Employ ethical considerations in different types of scientific research. -Doing research studies that add to the existing specialty knowledge and Publish scientific articles/papers (in indexed journals) and international conferences. 	<ul style="list-style-type: none"> -Be provided with knowledge, skills, and critical awareness to make a significant contribution to research. -Evaluate and judge scientific papers. -Explore how research comes out. -Use systematic approaches to design and conduct scientific research.
Use the analytical methods in the field of specialty	<ul style="list-style-type: none"> -Master the analytical approach to learning that uses prior knowledge as a base from which concepts can be described, hypotheses can be developed, and concepts can be rationally generalized by analyzing the components and the structure of the concepts. -Analyze main scientific advances in cell biology and histochemistry. - Studying different models of carcinogenesis on experimental animals under guide of the chemical safety. -Compare different statistical tests to analyze and interpret data. 	<ul style="list-style-type: none"> -Use available tools and stains to detect cellular disorders by histochemistry and immunohistochemistry. -Recognize basic principles of techniques and basic knowledge.
Integrate knowledge in the field of specialty with related knowledge, deduce and develop relationships between them.	<ul style="list-style-type: none"> -Get Specialized knowledge, includes a range of factual, theoretical and practical knowledge, as well as competencies and skills in Histochemistry and cell biology. -Use their specialized knowledge to understand the field and its interconnectedness and limits. 	<ul style="list-style-type: none"> -Be provided with knowledge, skills, and critical awareness to make a significant contribution to research. -Use available tools and stains to detect cellular disorders by histochemistry and immunohistochemistry. -Recognize basic principles of techniques and basic knowledge.

<p>Demonstrate awareness of current problems and modern visions in the field of specialty</p>	<p>-Promote and disseminate innovative, transformative, and impactful data on patient-oriented cancer research by Integrating the field of specialty with the Molecular Biology approach -Be aware of the current challenge in cancer treatment and Neurological disorders recovery to come up with ideas and apply novel approach for treatment</p>	<p>-Plan and implement enhancement and improvement approaches to practice. -Appraise the majority of problems according to the available data and take a decision in various professional situations.</p>
<p>Identify professional problems in the field of specialty and propose solutions to them.</p>	<p>-Think critically to evaluate <i>and improve</i> methods and tools used in specialty through live discussion in the Department seminars and activity.</p>	<p>-Appraise the majority of problems according to the available data and take decisions in various professional situations.</p>
<p>Master an appropriate of professional skills in the field of including use of technology.</p>	<p>-Master modern imaging technologies that have the impact on the field of cell biology -Label and monitor cells, organelles and molecules and their interactions, using increasingly sophisticated tools</p>	<p>- Competent in all basic and all acquired advanced professional skills, write and appraise reports and improve methods and tools used in specialty. - Use available tools and stains to detect cellular disorders by histochemistry and immunohistochemistry.</p>
<p>Communicate efficiently and lead work teams.</p>	<p>-Work effectively as a part of teamwork. By Communicate relentlessly and Set clear expectations for his research outcome. -Simplify research topics and be direct in transferring knowledge to his peers in the seminars by Illustrating through stories.</p>	<p>Communicate effectively through oral presentations. Establish work relationships with colleagues and work effectively as a part of a team.</p>
<p>Take Decisions in different professional contexts.</p>	<p>-Identify many potential options and anticipate possible outcomes in the research projects. -Consider the needs or wants of others impacted by the decision. -Understand the impact on a project, department and the organization as a whole. Deliberate when under pressure.</p>	<p>-Take decisions in various professional situations (including dilemmas & controversial issues).</p>

<p>Employ the available resources to achieve the highest benefit and maintain them.</p>	<p>-Understand which resources in the research project are in short supply and focus on them. -Agree on a common approach to prioritizing work across shared resources. Embrace different ways of working across the organization and resources</p>	<p>- Harness the available resources to achieve the highest benefit efficiently.</p>
<p>Show awareness of his/her role in community development and environmental preservation in light of global and regional changes.</p>	<p>-Save Resources by being trained for responsible use of natural resources in the ongoing projects</p>	<p>-Be cognizant of his role in community development.</p>
<p>Act in a manner that reflects a commitment to integrity, credibility, professionalism, and accountability.</p>	<p>-Deal with Conflict Properly in research projects. -Be Willing to Do Hard Work. Take Accountability for Actions and Be a Team Player.</p>	<p>- Take decisions in various professional situations (including dilemmas & controversial issues).</p>
<p>Realize the need for self-development and engaging in continuous learning.</p>	<p>-Proactively investigates new perspectives, approaches, and takes steps to evaluate and improve performance to pursue future goals</p>	<p>- Evaluate reflectively on their own learning process. Develop skills, in self-appraisal and seek continuous learning.</p>

