

## Program Specification for Professional Master Degree of Science in Biobanking

**Code: 1721500**

**University: Alexandria**

**Faculty: Medical Research Institute**

### Program Specification

#### A-Basic information

**1- Program title: Master in Biomedical Informatics & Medical statistics**

**2- Program type:** single  double  multiple

**3- Department(s): Biomedical Informatics & Medical statistics**

**4- Coordinator: Fayek Salah Elkhwesky**

**5- External evaluator(s):** Dr.Nahla Maher Afifi, Professor of Anatomy &Embryology,  
Department of Anatomy &Embryology, Faculty of Medicine., University of Ain Shams

Director Qatar Biobank, Qatar Foundation

**6- Last date of program specification approval: 8/11/2021**

#### B-Professional Information

##### 1- Program aims:

By end of the program, the student should be able to:

1. Examine in depth and produce an oral synthesis of the principles of practical biobanking.
2. Put different types of biobanks in perspective and draw conclusions about the theoretical underpinnings that were operational.
3. Apply the scientific basis of biobanking/biospecimen research in Standard Operating Procedure (SOP) development and implementation and in research exploitation of samples.
4. Question the logistical, practical and technical steps of biobanking, and evaluate their coherence and adequation.
5. Compare different reports on biobank risk management..
6. Develop Best Practices / SOPs).
7. Validate biobank protocols, training and technology transfers.

8. Analyze adequation to biobank Quality Management Systems (QMS) and the principles of certification, quality assurance and 3rd party ISO accreditation.
9. Professional Master the regulatory, legal and ethical aspects of biobanking.
10. Produce biobank cost analysis and recovery reports.
11. Use systematic approach to design and conduct scientific project

**a- knowledge and understanding:**

- a1. Define the concept of biobanks and explain their historical significance.
- a2- Explain the requirements for biobank infrastructure and consumables, including the necessary equipment, storage systems, and quality control measures
- a3- Define ethical principles outlined in the Declaration of Helsinki and their significance in protecting the rights and well-being of research participants
- a4- Explain quality assurance measures in biobanking, including the assessment and monitoring of sample quality, ensuring adherence to established standards and protocols.
- a5- Explain the core principles of human genetics and their implications on population genetics.
- a6- Explain the various instruments available for planning and organizing a sustainable biobank including budget and performance planning tools.
- a7- Explain the strategic role of biostatistics in biobanking including the requirements for data collection based on population and other factors.
- a8- Explain the scope of epidemiology
- a9- Explain the key components of an Integrated Laboratory and Operations System (ILOS) used in biobanks
- a10- Explain the fundamental concepts of computer networking and their relevance in biobanking data management

**b- Intellectual skills**

- b1. Analyze the interdisciplinary nature of biobanking, integrating knowledge from fields such as biology, medicine, ethics, and data management.
- b2- Analyze the requirements for biobank infrastructure and consumables, and critically evaluate their impact on sample storage, data management, and overall biobanking processes.
- b3- Analyse and interpret general international and regulatory conditions shaping biobanking practices, considering factors such as national and regional laws, guidelines, and ethical frameworks.
- b4- Analyze the molecular and cellular responses to altered environments, such as ischemia and hypoxia, within the context of biobanking, understanding their impact on sample quality and research outcomes.
- b5- Differentiate between the various techniques of RNA and DNA isolation and understand the contexts in which each should be applied.
- b6- Judge the efficiency and effectiveness of different business strategies in biobanking, including assessing the balance between research, quality, and economy.

- b7- Judge the effectiveness of different biobank statistics and strategies in achieving reliable and efficient data management.
- b8- Judge the validity of epidemiological studies
- b9- Differentiate between different biobanking models, including population-based and disease-focused biobanks.
- b10- Differentiate between different networking topologies and their suitability for biobank environments
- b11- Write a project protocol using a scientific systematic approach to a research problem

### **c- professional and practical skills:**

- c1. Practice effective strategies for sample collection, processing, and storage in a biobank, considering factors such as sample integrity, traceability, and quality control.
- c2-Apply the knowledge of biobank infrastructure requirements to plan and set up a functional and compliant biobank facility, considering factors such as equipment selection, storage systems, and appropriate consumables.
- c3- Practice the informed consent process, including the development of clear and comprehensive consent forms and effective communication strategies
- c4- Assess cryopreservation techniques by performing cryopreservation experiments using various cryoprotective agents, freezing methods, and storage conditions, and evaluating sample viability and recovery post-thaw.
- c5- Apply genomics and molecular genetics techniques in a practical biobanking environment, including the utilization of genomic data for personalized medicine.
- c6- Compute a detailed and comprehensive budget plan for a biobank considering all potential costs and avenues of funding.
- c7- Practice utilizing bioinformatics tools and techniques for data analysis in biobanking.
- c8-Assess the Basic Triad of Descriptive Epidemiology, Analytic Epidemiology
- c9- Apply ethical and regulatory principles to real-world biobanking scenarios, ensuring compliance and patient privacy.
- c10- Practice configuring network devices and ensuring data integrity and confidentiality

### **d- General and transferable skills**

- d1-Communicate through group discussion
- d2- Work as a part of team
- d3- Develop skills in Information Technology
- d4- Develop skills in independent learning.

## **3- Academic standards**

### **3a External references for standards (Benchmarks)**

Generic Academic Reference Standards if 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

NAQAAE	ARS
<p><b>A1-Basic facts , theories, of the specialty and related subjects/ fields</b></p>	<p>a1. Define the concept of biobanks and explain their historical significance.</p> <p>a2- Explain the requirements for biobank infrastructure and consumables, including the necessary equipment, storage systems, and quality control measures</p> <p>a4- Explain quality assurance measures in biobanking, including the assessment and monitoring of sample quality, ensuring adherence to established standards and protocols.</p> <p>a5- Explain the core principles of human genetics and their implications on population genetics .</p> <p>a7- Explain the strategic role of biostatistics in biobanking including the requirements for data collection based on population and other factors.</p> <p>a8-Explain the scope of epidemiology</p> <p>a9- Explain the key components of an Integrated Laboratory and Operations System (ILOS) used in biobanks</p> <p>a10- Explain the fundamental concepts of computer networking and their relevance in biobanking data management</p>
<p><b>A2-Mutual relation between professional practice and effects on environment</b></p>	<p>a2- Explain the requirements for biobank infrastructure and consumables, including the necessary equipment, storage systems, and quality control measures</p> <p>a4- Explain quality assurance measures in biobanking, including the assessment and monitoring of sample quality, ensuring adherence to established standards and protocols.</p> <p>a6- Explain the various instruments available for planning and organizing a sustainable biobank including budget and performance planning tools.</p> <p>a7- Explain the strategic role of biostatistics in biobanking including the requirements for data collection based on population and other factors.</p> <p>a8-Explain the scope of epidemiology</p> <p>a9- Explain the key components of an Integrated Laboratory and Operations System (ILOS) used in biobanks</p>

<b>NAQAAE</b>	<b>ARS</b>
<b>A3-Main scientific advances in the field of practice</b>	<p>a2- Explain the requirements for biobank infrastructure and consumables, including the necessary equipment, storage systems, and quality control measures</p> <p>a3- Define ethical principles outlined in the Declaration of Helsinki and their significance in protecting the rights and well-being of research participants</p> <p>a4- Explain quality assurance measures in biobanking, including the assessment and monitoring of sample quality, ensuring adherence to established standards and protocols.</p> <p>a6- Explain the various instruments available for planning and organizing a sustainable biobank including budget and performance planning tools.</p> <p>a9- Explain the key components of an Integrated Laboratory and Operations System (ILOS) used in biobanks</p> <p>a10- Explain the fundamental concepts of computer networking and their relevance in biobanking data management</p>
<b>A4-Fundamentals of ethical &amp; legal practice</b>	<p>a3- Define ethical principles outlined in the Declaration of Helsinki and their significance in protecting the rights and well-being of research participants</p> <p>a4- Explain quality assurance measures in biobanking, including the assessment and monitoring of sample quality, ensuring adherence to established standards and protocols.</p> <p>a6- Explain the various instruments available for planning and organizing a sustainable biobank including budget and performance planning tools.</p>
<b>A5 -Quality standards of the practice</b>	<p>a4- Explain quality assurance measures in biobanking, including the assessment and monitoring of sample quality, ensuring adherence to established standards and protocols.</p> <p>a6- Explain the various instruments available for planning and organizing a sustainable biobank including budget and performance planning tools.</p> <p>a9- Explain the key components of an Integrated Laboratory and Operations System (ILOS) used in biobanks</p> <p>a10- Explain the fundamental concepts of computer networking and their relevance in biobanking data management</p>

NAQAAE	ARS
<b>A6- Basics and ethics of scientific research</b>	<p>a3- Define ethical principles outlined in the Declaration of Helsinki and their significance in protecting the rights and well-being of research participants</p> <p>a6- Explain the various instruments available for planning and organizing a sustainable biobank including budget and performance planning tools.</p> <p>a7- Explain the strategic role of biostatistics in biobanking including the requirements for data collection based on population and other factors.</p>
<b>B1 -Interpret, analyze &amp; evaluate the information to solve problems</b>	<p>b1. Analyze the interdisciplinary nature of biobanking, integrating knowledge from fields such as biology, medicine, ethics, and data management.</p> <p>b2- Analyze the requirements for biobank infrastructure and consumables, and critically evaluate their impact on sample storage, data management, and overall biobanking processes.</p> <p>b3- Analyse and interpret general international and regulatory conditions shaping biobanking practices, considering factors such as national and regional laws, guidelines, and ethical frameworks.</p> <p>b4- Analyze the molecular and cellular responses to altered environments, such as ischemia and hypoxia, within the context of biobanking, understanding their impact on sample quality and research outcomes .</p> <p>b5- Differentiate between the various techniques of RNA and DNA isolation and understand the contexts in which each should be applied.</p> <p>b6- Judge the efficiency and effectiveness of different business strategies in biobanking, including assessing the balance between research, quality, and economy.</p> <p>b7- Judge the effectiveness of different biobank statistics and strategies in achieving reliable and efficient data management.</p>
<b>B2- Solve some problems that do not conform to classic data ( incomplete data)</b>	<p>b4- Analyze the molecular and cellular responses to altered environments, such as ischemia and hypoxia, within the context of biobanking, understanding their impact on sample quality and research outcomes .</p> <p>b7- Judge the effectiveness of different biobank statistics and strategies in achieving reliable and efficient data management.</p> <p>b10- Differentiate between different networking topologies and their suitability for biobank environments</p>

NAQAAE	ARS
<b>B3- Integrate different information to solve professional problems</b>	b1. Analyze the interdisciplinary nature of biobanking, integrating knowledge from fields such as biology, medicine, ethics, and data management. b3- Analyse and interpret general international and regulatory conditions shaping biobanking practices, considering factors such as national and regional laws, guidelines, and ethical frameworks. b4- Analyze the molecular and cellular responses to altered environments, such as ischemia and hypoxia, within the context of biobanking, understanding their impact on sample quality and research outcomes .
<b>B4- Conduct a scientific research &amp;/Or write scientific systematic approach to a research problem ( hypothesis)</b>	b7- Judge the effectiveness of different biobank statistics and strategies in achieving reliable and efficient data management. b8- Judge the validity of epidemiological studies b9- Differentiate between different biobanking models, including population-based and disease-focused biobanks b11-Write a project protocol using a scientific systematic approach to a research problem .
<b>B5- Evaluate risks imposed during professional practice.</b>	b4- Analyze the molecular and cellular responses to altered environments, such as ischemia and hypoxia, within the context of biobanking, understanding their impact on sample quality and research outcomes . b6- Judge the efficiency and effectiveness of different business strategies in biobanking, including assessing the balance between research, quality, and economy.
<b>B6- Plan for professional improvement</b>	b2- Analyze the requirements for biobank infrastructure and consumables, and critically evaluate their impact on sample storage, data management, and overall biobanking processes. b4- Analyze the molecular and cellular responses to altered environments, such as ischemia and hypoxia, within the context of biobanking, understanding their impact on sample quality and research outcomes . b6- Judge the efficiency and effectiveness of different business strategies in biobanking, including assessing the balance between research, quality, and economy. b7- Judge the effectiveness of different biobank statistics and strategies in achieving reliable and efficient data management. b10- Differentiate between different networking topologies and their suitability for biobank environments

<b>NAQAAE</b>	<b>ARS</b>
<b>B7- Take professional decisions in wide range of professional situations</b>	b6- Judge the efficiency and effectiveness of different business strategies in biobanking, including assessing the balance between research, quality, and economy. b7- Judge the effectiveness of different biobank statistics and strategies in achieving reliable and efficient data management.
<b>C1- Competent in all basic and some of the advanced professional skills ( to be determined according to the specialty board/ department)</b>	c1. Practice effective strategies for sample collection, processing, and storage in a biobank, considering factors such as sample integrity, traceability, and quality control. c2-Apply the knowledge of biobank infrastructure requirements to plan and set up a functional and compliant biobank facility, considering factors such as equipment selection, storage systems, and appropriate consumables. c3- Practice the informed consent process, including the development of clear and comprehensive consent forms and effective communication strategies c4- Assess cryopreservation techniques by performing cryopreservation experiments using various cryoprotective agents, freezing methods, and storage conditions, and evaluating sample viability and recovery post-thaw. c5- Apply genomics and molecular genetics techniques in a practical biobanking environment, including the utilization of genomic data for personalized medicine. c6- Compute a detailed and comprehensive budget plan for a biobank considering all potential costs and avenues of funding. c7- Practice utilizing bioinformatics tools and techniques for data analysis in biobanking. c8-Assess the Basic Triad of Descriptive Epidemiology, Analytic Epidemiology c9- Apply ethical and regulatory principles to real-world biobanking scenarios, ensuring compliance and patient privacy. c10- Practice configuring network devices and ensuring data integrity and confidentiality
<b>C2- Write and appraise reports</b>	c3- Practice the informed consent process, including the development of clear and comprehensive consent forms and effective communication strategies. c6- Compute a detailed and comprehensive budget plan for a biobank considering all potential costs and avenues of funding. c7- Practice utilizing bioinformatics tools and techniques for data analysis in biobanking.



NAQAAE	ARS
<b>C3-Evaluate methods and tools used in specialty</b>	c4- Assess cryopreservation techniques by performing cryopreservation experiments using various cryoprotective agents, freezing methods, and storage conditions, and evaluating sample viability and recovery post-thaw. c7- Practice utilizing bioinformatics tools and techniques for data analysis in biobanking. c8-Assess the Basic Triad of Descriptive Epidemiology, Analytic Epidemiology
<b>D1- Communicate effectively using all methods</b>	d1-Communicate through group discussion
<b>D2- Use information technology to improve his/her professional practice</b>	d1-Communicate through group discussion d2- Develop skills in Information Technology
<b>D3- Practice self appraisal and determines his learning needs</b>	d3- Develop skills in Information Technology
<b>D4- Share in determination of standards for evaluation of others (e.g.: subordinates/ trainees etc.)</b>	d4- Develop skills in independent learning.
<b>D5- Use different sources of information to obtain data</b>	d3- Develop skills in Information Technology
<b>D6- Work in teams</b>	d2- Work as a part of team
<b>D7- Manage time effectively</b>	d5-develop skills in time Management
<b>D8- Work as team leader in situations comparable to his work level</b>	d2- Work as a part of team
<b>D9- Learn independently and seek continuous learning</b>	d3- Develop skills in Information Technology

#### 4- Curriculum structure and contents

**4.a program duration:** *a minimum of 3 semesters*

**4.b program structure :**

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

Semester	Core courses	Elective Courses

	No. of hours	No. of hours
First semester	8	0
Second semester	9	0
Third semester	6	0
Fourth semester	3	4

4.b.ii- No. of credit hours	Lectures	<input type="text" value="20"/>	Practical	<input type="text" value="10"/>	project	<input type="text" value="6"/>	Total	<input type="text" value="36"/>
	Compulsory	<input type="text" value="26"/>	Elective	<input type="text" value="4"/>	Optional	<input type="text" value="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.viii- Program levels (in credit-hours system)

## 5- Program Courses

### 5.1- Compulsory (26 CH)

Course no.	Course title	No. of hours /week		Total Credit hours
		Lectures	Practical	
1221501	Basics ,needs and Creating Biobanks	2	2	3
1221502	Standard Operation Procedures	2	2	3
1221503	ELSI ( Ethical, Legal, Societal Issues	2	2	3
1221504	Samples collection, storage , shipment	2	2	3
1221505	Genetics and Genomic studies	4	2	5

1221506	Financial Sustainability of Biobank	2	2	<b>3</b>
1221507	Biostatistics and data management	2	2	<b>3</b>
1221508	Epidemiology & Research Methods	2	2	<b>3</b>
	total	18	8	<b>26</b>

### 5.2- Elective I (4 CH)

Course no.	Course title	No. of hours /week		Total credit hours
		Lectures	Practical	
1221509	<b>IT landscape in Biobanks</b>	2	4	4
1221510	<b>Networking , local and International</b>	2	4	4

## 6- Program admission requirement

Admission to the “Professional Master degree of Science in Biobanking” programme requires:

- 1) A Bachelor’s degree for medical or paramedical
- 2) A Bachelor’s degree in natural sciences (biology, molecular biology, biotech etc).  
or
- 3) Any University degree in medicine or pharmacy of a nationally or internationally accepted tertiary education institution.

## 7- Teaching and Learning methods

Lecture  
Practical/Clinical  
Brainstorming  
Group discussion  
Problem Solving  
Case Study

## 8- Regulations for progression and program completion

For the progression and completion of the program to obtain the degree of Professional Master Degree of Science in Biobanking, the student must:

- 1- complete a total of 30 credit hours (30 credit hours with CGPA of at least C+)
- 2- Complete ...6.... credit hours with through project.

3- Submit a project validity report by an examination committee approved by the department council and their members include at least two external examiners.

### 8-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

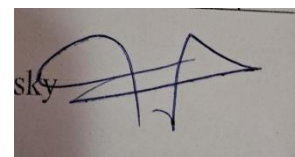
### Evaluation of program:

Evaluator	Tool	Sample
1- Senior students	Questionnaire	At least 50 %
2- Alumni	Questionnaire	Representative sample
3- Stakeholders (Employers)	Meeting	Representative sample
4- External Evaluator(S) or External Examiner (s)	Reports	Dr.Nahla Maher Afifi
5- Other		

### Program coordinator:

Name: Dr Fayek Elkhwesky

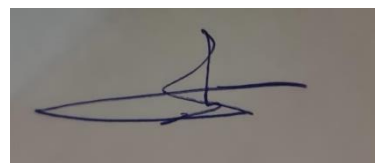
Signature:



### Department Head:

Name: Dr. Iman El Sayed

Signature:



**Date of Department Council Approval: 29/8/2023**

**Courses Vs ILOs matrix**

Course	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10	B11	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	d1	d2	d3	d4	
501	X										X											X										X	X	X		
502		X										X											X											X	X	X
503			X										X											X										X	X	
504				X										X											X							X	X			
505					X										X										X						X	X	X	X		
506						X										X										X							X	X		
507							X										X										X						X	X	X	
508								X										X										X					X	X		
509									X										X										X					X	X	
510										X											X									X			X	X		
project																						X										X	X			

**Teaching and Learning Methods Vs Courses Matrix**  
**Degree: Master** **Code: 1721500**

	1221 501	1221 502	1221 503	1221 504	1221 505	1221 506	1221 507	1221 508	1221 509	1221 510
Lecture	X	x	x	x	x	x	x	x	x	x
Practical/Clinical	X	x	x	x	x	x	x	x	x	x
Brainstorming	X	x				x		x		
Group discussion	x	x	x			x		x	x	
Problem Solving	X	x	x	x		x		x		
Case Study								x	x	
Training Workshops							x	x		
Self-Directed Learning	x	X				x		x	x	x
e-learning									x	
Project				x				x	x	

**ARS Vs ILos matrix**

ARS	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10	B11	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	D1	D2	D3	D4					
a1	X																																							
a2		X																																						
a3			X																																					
a4				X																																				
a5					X																																			
a6						X																																		
a7							X																																	
a8								X																																
a9									X																															
a10		x								X																														
ARS	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	D1	D2	D3	D4					
i1											X																													
b2												X																												
b3													X																											
b4														X																										
b5															X																									
b6																X																								
b7																	X																							
b8																		X																						
b9																			X																					
b10												x								X																				
B11																						x																		
ARS	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	D1	D2	D3	D4					
c1																						X																		
c2																							X																	
c3																								X																
c4																								X																
c5																									X															
c6																										X														
c7																											X													
c8																												X												
c9																													X											
c10																														X										
D1																																								
D2																																								
D3																																								
D4																																								
D5																																								

### Program aims vs. ILos matrix

Program aims	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10	B11	
1-Examine in depth and produce an oral synthesis of the principles of practical biobanking.	X	X		X		X	X		X	X	X	X										
2-Put different types of biobanks in perspective and draw conclusions about the theoretical underpinnings that were operational.	X					X			X		X		X						X			
3-Apply the scientific basis of biobanking/biospecimen research in Standard Operating Procedure (SOP) development and implementation and in research exploitation of samples.	X			X					X		X		X									
4-Question the logistical, practical and technical steps of biobanking, and evaluate their coherence and adequation.		X		X		X					X								X			
5-Compare different reports on biobank risk management.			X	X						X					X			X				
6-Develop Best Practices / SOPs).	X			X					X		X		X									
7-Validate biobank protocols, training and technology transfers.	X		X	X							X								X	X		
8-Analyze adequation to biobank Quality Management Systems (QMS) and the principles of certification, quality assurance and 3rd party ISO accreditation.				X					X		X											
9-Professional Master the regulatory, legal and ethical aspects of biobanking.				X							X		X									
10-Produce biobank cost analysis and recovery reports.						X										X						
11-Use systematic approach to design and conduct scientific project					X											X						X



Program aims	c1	c2	c3	c4	c5	c6	c7	c8	c9	C10	d1	d2	d3	d4
1-Examine in depth and produce an oral synthesis of the principles of practical biobanking.	X	X		X	X						X	X	X	X
2-Put different types of biobanks in perspective and draw conclusions about the theoretical underpinnings that were operational.											X	X	X	X
3-Apply the scientific basis of biobanking/biospecimen research in Standard Operating Procedure (SOP) development and implementation and in research exploitation of samples.	X	X									X	X	X	X
4-Question the logistical, practical and technical steps of biobanking, and evaluate their coherence and adequation.	X	X		X	X		X	X			X	X	X	X
5-Compare different reports on biobank risk management..											X	X	X	X
6-Develop Best Practices / SOPs).											X	X	X	X
7-Validate biobank protocols, training and technology transfers.			X	X	X						X	X	X	X
8-Analyze adequation to biobank Quality Management Systems (QMS) and the principles of certification, quality assurance and 3rd party ISO accreditation.	X	X								X	X	X	X	X
9-Professional Master the regulatory, legal and ethical aspects of biobanking.	X	X	X	X					X	X	X	X	X	X
10-Produce biobank cost analysis and recovery reports.		X				X					X	X	X	X
11-Use systematic approach to design and conduct scientific project						X								

### Graduate attributes vs program aims

Generic Graduate Attributes of NAQAAE	Graduate Attributes of Professional Master Degree of Science in Biobanking By the end of this program, Graduate of Professional Master Degree of Science in Biobanking <i>should be able to</i>	Program aims
Apply the basics and methodologies of scientific research and using its various tools proficiently.	Apply the basics and methodologies of scientific research in biobank	Examine in depth and produce an oral synthesis of the principles of practical biobanking.
Use the analytical methods in the field of specialty	Use the analytical methods in biobanking	Put different types of biobanks in perspective and draw conclusions about the theoretical underpinnings that were operational.
Apply specialized knowledge in the field of specialty and integrate it with relevant knowledge in his professional practice.	Apply acquired knowledge in the field of biobanking and international coding and integrate it with relevant knowledge in his professional practice.	Apply the scientific basis of biobanking/biospecimen research in Standard Operating Procedure (SOP) development and implementation
Demonstrate awareness of current problems and modern visions in the field of specialty	Demonstrate awareness of current problems and modern visions in the field of biobank.	Question the logistical, practical and technical steps of biobanking, and evaluate their coherence and adequation.
Identify professional problems in the field of specialty and propose solutions to them.	Identify professional problems in the field of biobank and propose solutions to them.	Compare different reports on biobank risk management.
Master an appropriate of professional skills in the field of including use of technology.	Master an appropriate of professional skills in the field of statistical software's use and internet search.	Develop Best Practices / SOPs).
Communicate efficiently and lead work teams.	Communicate efficiently with colleagues and staff and lead work teams through group working.	Validate biobank protocols, training and technology transfers.
Take Decision in different professional contexts.	Take Decision in different statistical problems& field of biobank	Analyze adequation to biobank Quality Management Systems (QMS) and the principles of certification, quality assurance and 3rd party ISO accreditation.
Employ the available resources to	Employ the available softwares to achieve the highest	Professional Master the regulatory, legal and ethical



achieve the highest benefit and maintain them.	benefit in data analysis.	aspects of biobanking.
Show awareness of his/her role in community development and environmental preservation in light of global and regional changes.	Show awareness of his/her role in community development and environmental preservation in light of global and regional changes.	Produce biobank cost analysis and recovery reports.
Act in a manner that reflects a commitment to integrity, credibility, professionalism, and accountability.	Act in a manner that reflects a commitment to integrity, credibility, professionalism.	Use systematic approach to design and conduct scientific project
Realize the need for self-development and engaging in continuous learning.	Realize the need for self-development and engaging in continuous learning in the field of biobanking.	Apply the scientific basis of biobanking/biospecimen research in Standard Operating Procedure (SOP) development and implementation