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جامعة مدينة السادات  
معهد بحوث الهندسة الوراثية والتكنولوجيا الحيوية  
وحدة ضمان الجودة و التطوير المستمر

***Animal Biotechnology  
Doctorate Program  
Specification  
(2015/2016)***



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المحتويات

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***I***  
***ACADEMIC REFERENCE***  
***STANDARDS (ARS)***  
***FOR POSTGRADUATE***  
***STUDIES, NAQAAE,***  
***MARCH 2009***



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## Academic reference standards (ARS) for postgraduate studies, NAQAAE, March 2009

### 1- Graduate Attributes

#### 1-The graduate of Doctorate program must:

- 1.1. Master basics and methodologies of scientific research.
- 1.2. Add to the knowledge in the specialization field.
- 1.3. Apply analytical and critical approach to the knowledge in specialty and related areas.
- 1.4. Merge and develop specialized knowledge with that of related subjects extrapolating bilateral ties in between.
- 1.5. Show deep consciousness of the ongoing specialty problems and theories.
- 1.6. Determine professional problems and find innovative solutions.
- 1.7. Master a wide range of professional skills in the specialty area.
- 1.8. Work towards the development of professional methods, and new tools.
- 1.9. Use appropriate technological means to serve professional practice.
- 1.10. Communicate effectively and lead work team in different professional contexts.
- 1.11. Make decisions according to available information.
- 1.12. Employ available and new resources efficiently and work on developing.
- 1.13. Be aware of the role in community development and environmental conservation.
- 1.14. Act in a manner reflecting the commitment to integrity, credibility and rules of the profession.
- 1.15. Be committed to continuous self-development and transfer knowledge and expertise to others.

### 2- General academic standards:

#### 2.1. Knowledge & Understanding:

**By the end of the study of Doctorate program of any specialty, the graduate must have fluent deep knowledge & understanding of:**

- 2.1.1. Basic facts, theories and recent advances of the specialty and related subjects.
- 2.1.2. Basics, methodologies and scientific research ethics as its different tools.
- 2.1.3. Ethical and legal principles of professional practice.
- 2.1.4. Quality standards of professional practice.
- 2.1.5. Knowledge related to the professional practice impact on the environment development and conservation.

#### 2.2. Intellectual skills:

**By the end of the Doctorate program study in any specialty, the graduate must be able to:**

- 2.2.1. Analyze, evaluate and deduce the information in the specialty fields.
- 2.2.2. Solve the specialized problems according to available data.
- 2.2.3. Conduct research studies that add to specialty knowledge.
- 2.2.4. Write and publish scientific articles.
- 2.2.5. Evaluate professional practice risks.



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- 2.2.6. Plan to improve specialty performance.
- 2.2.7. Take decisions in various professional situations including dilemmas and controversial issues.
- 2.2.8. Add to the specialty field through creativity & innovation.
- 2.2.9. Manage discussions on basis of evidence and proofs.

### 2.3. Professional skills:

**By the end of Doctorate program study in any specialty, the graduate must:**

- 2.3.1. Master basic and advanced professional skills in the specialty field.
- 2.3.2. Write and appraise professional reports.
- 2.3.3. Evaluate and improve methods and tools used in the specialty.
- 2.3.4. Use technological tools to serve professional practice.
- 2.3.5. Plan for professional practice development and performance of others.

### 2.4. General & transferable skills:

**By the end of the study of Doctorate program of any specialty, the graduate must:**

- 2.4.1. Communicate effectively using different means.
- 2.4.2. Use information technology to improve professional practice.
- 2.4.3. Teach and evaluate others.
- 2.4.4. Perform self appraisal and seek continuous learning.
- 2.4.5. Use different resources to obtain information and knowledge.
- 2.4.6. Work in and lead a team.
- 2.4.7. Manage scientific meetings and time.



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## ***II***

# ***ACADEMIC REFERENCE STANDARDS FOR DOCTORATE POSTGRADUATE STUDIES OF ANIMAL BIOTECHNOLOGY***



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## 2- Animal Biotechnology Program Academic standards:

### 2.1- Graduate Attributes

#### 1-The graduate of Doctorate program must:

- 1.1. Master basics and methodologies of scientific research.
- 1.2. Add to the knowledge in the animal biotechnology and related field.
- 1.3. Apply analytical and critical approach to the knowledge in cell culture, virology, tissue engineering and aquatic biotechnology .
- 1.4. Merge and develop specialized knowledge with that of current techniques of reproduction extrapolating bilateral ties in between.
- 1.5. Demonstrate deep considerations of the ongoing specialty problems and theories.
- 1.6. Determine professional problems and find innovative solutions.
- 1.7. Master a wide range of professional skills in animal biotechnology area and its subfield.
- 1.8. Work towards the development of professional methods, and new tools applied in cell and tissue engineering, viral biotechnology.
- 1.9. Communicate effectively and lead work team in different professional contexts.
- 1.10. Make decisions according to available information.
- 1.11. Employ available and new resources efficiently and work on developing.
- 1.12. Be aware of the role in community development and environmental conservation.
- 1.13. Act in a manner reflecting the commitment to integrity, credibility and rules of the profession.
- 1.14. Be committed to continuous self-development and transfer knowledge and expertise to others.

### 2.2 Knowledge & Understanding

#### By the end of the study graduate must have sufficient knowledge & understanding of:

- 3.1.1 Basic facts, theories and recent advances of the animal biotechnology and related subjects.
- 3.1.2 Basics , methodologies and scientific research ethics as its different tools in different domain of animal biotechnology
- 3.1.3 Ethical and legal fundamentals (research writing – supervising – authorizing – applying) and their applications on the field of cell culture, viral biotechnology, new technologies of reproduction (cloning, embryo transfer and tissue engineering), aquatic biotechnology.
- 3.1.4 Quality standards of professional practice in the field of animal biotechnology branches.
- 3.1.5 Knowledge related to the professional practice impact on the environment development and conservation.

### 2.3 Intellectual Skills

#### By the end of the Doctorate program study in any specialty, the graduate must be able to:



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- 3.2.1 Analyze, evaluate and deduce the information in the field of animal biotechnology.
- 3.2.2 Solve the specialized problems according to available data of cell and viral biotechnology.
- 3.2.3 Conduct research studies that add knowledge to aquatic biotechnology.
- 3.2.4 Write and publish scientific articles in the field of animal biotechnology (cell culture, virology, new technology in reproductions and tissue engineering).
- 3.2.5 Evaluate professional practice risks in different sub branches of animal biotechnology.
- 3.2.6 Plan to improve specialty performance in the field of animal biotechnology.
- 3.2.7 Take decisions in various professional situations including dilemmas and controversial issues.
- 3.2.8 Add creativity and innovation to the animal biotechnology specialty.
- 3.2.9. Manage discussions on basis of evidence and proofs to improve research in biotechnology.

### **3.3. Professional skills**

**By the end of Doctorate program study the graduate must:**

- 3.3.1 Master basic and advanced professional skills in the field of animal cell biotechnology.
- 3.3.2 Write and appraise professional reports about animal biotechnology branches.
- 3.3.3 Evaluate and improve methods and tools used in the field of viral and aquatic biotechnology.
- 3.3.4 Use technological tools to serve professional practice.
- 3.3.5 Plan for professional practice development and performance of others.

### **3.4. General & Transferable skills**

**By the end of the study of Doctorate program the graduate must:**

- 3.4.1 Communicate effectively using different means.
- 3.4.2. Use information technology to improve professional practice .
- 3.4.3. Teach and evaluate others.
- 3.4.4. Perform self appraisal and seek continuous learning.
- 3.4.5. Use different resources to obtain information and knowledge.
- 3.4.6. Work in and lead a team.
- 3.4.7. Manage scientific meetings and time.





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***II***  
***Matrix between***  
***Program ARS***  
***and***  
***NAQAAE-ARS***  
**(March 2009)**



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## 2.1 Knowledge & Understanding

ARS	ARS				
	2.1.1	2.1.2	2.1.3	2.1.4	2.1.5
3.1.1	X				
3.1.2		X			
3.1.3			X		
3.1.4				X	
3.1.5					X

## 2.2. Intellectual Skills

ARS	ARS								
	2.2.1	2.2.2	2.2.3	2.2.4	2.2.5	2.2.6	2.2.7	2.2.8	2.2.9
3.2.1	X								
3.2.2		X							
3.2.3			X						
3.2.4				X					
3.2.5					X				
3.2.6						X			
3.2.7							X		
3.2.8								X	
3.2.9									X

## 2.3.1 Professional Skills

ARS	ARS				
	2.3.1	2.3.2	2.3.3	2.3.4	2.3.5
3.3.1	X				
3.3.2		X			
3.3.3			X		
3.3.4				X	
3.3.5					X



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***ANIMAL BIOTECHNOLOGY***  
***DOCTORATE***  
***PROGRAM SPECIFICATION***  
***(2015/2016)***



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## Doctorate Program Specification

(2015/2016)

### A-Basic Information

- 1- Program title: **Doctorate in Animal Biotechnology**
- 2- Program type:           Single            Double           Multiple
- 3- Department: **Animal Biotechnology**
- 4- Program Coordinator: **Dr./ Osama Badr**
- 5- Program Approval Date: **٢٠ / 4 / 2010**
- 6- Program initiation Date:  **/ / 2002**
- 7- Program internal reviewer: **Prof.H. Dahy Mahboub**
- 8- Program external reviewer: **Prof. Sherif Mousa Elsherbieny**

### Department mission and vision:

The mission of the program Animal Biotechnology is divided actually in two principal lines the first is to develop the domain of animal biotechnology through multidisciplinary research activities on different model animal systems, insects, pathogens, fish (aquatics), *in vitro* technologies, make fundamental discoveries, generate innovative solutions to practical problems, and develop new technologies for commercial applications.

The second parallel principal line is the academic **educational** mission to educate and excite professional and personal growth students capable to receiving, to design and performing with interests in the life sciences could react with the job market and environmental problems

**Our goals:** More teachers teaching and more students learning and manipulate animal biotechnologies. One of our objectives is to develop receiving units for the new emerging technologies, infrastructure to be able to establish several linkages with various biotechnology laboratories at international standards in advanced countries.



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## **B- Professional Information:**

### **1- Program aims:**

**Program aims to develop and manage new vision toward supervising scientific research projects in the field d subfield of animal biotechnology and to:**

- 1.1. Prepare distinguished graduates capable to apply the most recent techniques in the field of animal biotechnology and aquatic biotechnology.
- 1.2. Develop student specialized knowledge and skills to solve the theoretical and practical cell culture , virology and different modern techniques of reproduction problems.
- 1.3. Help students to acquire the skills of writing and publishing research papers in animal biotechnology journals and scientific conferences.
- 1.4. Develop the student research team-work skills and setting research rules in the field of animal biotechnology in relation with environmental biotechnology.
- 1.5. Enhance the students understanding of research system (input – process-output) and be able to develop and manage new vision toward supervising scientific research projects in the field of animal biotechnology.

### **2- Intended learning outcomes (ILOs):**

#### **2/1 Knowledge and understanding:**

*By the end of this program, the graduate must able to:*

- a- Understand in depth the basic facts & theories of transgenic animals, immunology and identify the fundamentals of cell culture, cell biology, molecular cancer biology and basic concepts of biological electron microscope.
- b- Explain precisely the mutual links between different molecular mechanisms of animal biotechnology, electroporation, insects and insect viruses.
- c- Know critically the main scientific basics of intensive fish farming, bio-control and importance of genetics and breeding of fish.
- d- Express the fundamental of ethical and legal practice and their using in the biotechnology, animal virus pathogenesis, and describe the technologies in animal reproduction and protocols in applications of DNA markers.
- e- Realize the actual quality standards of the analysis methods in sex predetermination and genomic imprinting.
- f- Explain basics and ethics of scientific research fields,
- g- Understand terminology written in germane language and identify advanced computer models used in animal biotechnology analysis.

#### **2/2 Intellectual skills:**

*By the end of this program, the graduate must able to:*

- a- Innovate the suitable methods for cell culture, IVF and protocols of DNA markers.



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- b- Evaluate and determine the biological effect of viruses involved in the development of animal and insect diseases.
- c- Interpret results of different methods of Poultry biotechnology and technologies of animal reproduction.
- d- Determine different data and information needed to solve the problems of genetically engineered organisms in animal biotechnology and genetic control of insects.
- e- Distinguish between the different aspects of molecular viruses involved in the development of animal diseases and immunology methods.
- f- Determine problems in the scientific researches of aquaculture.
- g- Find solution to the risks imposed during the treatment and analysis of animal biotechnology and transgenic animals.
- h- Evaluate professional decision taking for suitable methods of biological protocols in electron microscope and Electroporation for microorganism.
- i- Search and interpret findings in practice advanced computer presentations using sometimes terminology written in germane language.

### **2/3 Professional skills:**

***By the end of this program, the graduate must able to:***

- a – Write professional scientific reports in the field of biotechnology new technologies in animal reproduction.
- b – Execute the basic and advanced professional skills in protocols and applications of DNA markers and genomic imprinting during the experimental work in research.
- c –Select and evaluate methods and tools during the research in animal cell culture, transgenic animals genetic breeding of fish, immunology and biotechnology.
- d – Prepare modern modules and estimate the usefulness of laboratory techniques applied for molecular diagnosis of animal (insect, poultry and fish ect.) pathology.
- e- Use professional technologies for serving research and practice in electron microscope and electroporation..

### **2/4 General and transferable skills:**

***By the end of this program, the graduate must:***

- a- Work in team with public, colleagues and appropriate authorities.
- b- Show management skills for using information technology to improve his/her professional practice in internet and relative information.
- c- Use different sources of information to obtain data for a given course topics.
- d- Communicate with others and manage time effectively.
- e- Show self learning abilities in situation comparable to his level.
- f-Use audio and video means for displaying information to learn independently and seek continuous learning in animal biotechnology research.



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### 3- Program Academic standards:

- **Academic Standards of Animal Biotechnology PhD program** approved in department council no ( ) date / / , and in institute council no. ( ) date /.

(ملحق ١)

### 4- Bench Marks: ARS

#### a) ( Reference standards (Benchmarks)

#### Academic reference standards (ARS), doctorat Program (March 2009)

, which were issued by the National Authority for Quality Assurance & Accreditation of Education NAQAAE (ملحق ٢)

#### b) External references standards:

(ملحق ٣).

### 5. Curriculum Structure and Contents:

a. Program duration: at least 3 years.

b. Program structure: No. of hours/units: 44/36

Lectures	Lab./Exercise	Total
28	16	44
Compulsory 32	Optional	Elective 12

#### ▪ Basic sciences courses

No.	%
7	63.6

#### ▪ Social sciences and

No.	%
1	9

humanity courses



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	No.	%
Specialized courses	4	36.3

	No.	%
▪ Other sciences courses		

	No.	%
▪ Practical/Field Training	The time spent in achievement of a thesis (8 hrs/week)	

**c. Program Levels (in credit-hours system): Not Applied**

**d. Program courses:**

**d.1- Compulsory (General Courses):**

Code No.	Course Title	No. of Units (hrs)	No. of hours/week		
			Lect.	Ex.	App.
	German language	3	3	-	
A-81	Advanced Computer	3	2		2
	Research and research methodology	6	2		8
B4-27	Special topics	3	3	-	
B4-28	Seminars	3	---		6
A-24	Advanced biotechnology	3	3	-	
B4-4	Animal cell culture II	3	3	-	
	<b>Total</b>	24	16		16





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**d.2. Elective: Specialized courses (4 courses from the listed below at least)**

	Code No.	Course Title	No. of Units	No. of hours/week		
				Lect	Ex.	Lab/ App.
1	A-77	Topics in cell and developmental biology	3	3		
2	B4-26	Transgenic animals	3	3		
3	B4-16	Intensive fish farming	3	3		
4	B4-23	Poultry Biotechnology.	3	3		
5	B4-43	Molecular cancer biology	3	3		
6	B4-15	Genetics and breeding of fish	3	3		
7	B4-25	Technologies in animal reproduction	3	3		
8	B4-6	Animal virus pathogenesis	3	3		
9	B4-24	Sex predetermination	3	3	-	
10	B7-14	Genomic Imprinting	3	3		
11	B1-37	Molecular biology of insects and Insect viruses	3	3		
12	B1-20	Genetic control of insects	3	3		
13	C-52	Methods and protocols in electron microscopy	3	2	2	
14	C-26	Electroporation protocols for microorganisms	3	2	2	
15	C-64	Immunology methods III	3	2	2	

**d.3. PhD dissertation (at least three academic years)**

All PhD-degree students should prepare a thesis in Industrial biotechnology. The department and the ethical committees must approve the protocol of the research. The thesis should include a review part and a research part. The thesis is supervised by one or more senior staff members of the Department of Industrial biotechnology and may include other specialties according to the nature of the research. The thesis should be evaluated and approved by a committee of three professors including one of the supervisors and an external professor.

**6. Program admission requirements:**

1. Bachelor degree from appropriate practical faculty from Egyptian or an equivalent university with general grade (Good), or diploma in one field of Animal biotechnology and master in the field of Animal biotechnology.

**7. Regulations for progression and program completion:**

- Successful completion of the required courses (equivalent to at least 18 units) in addition to compulsory courses: German language, advanced computer, Research and research methodology, special topics, Seminars, Biotechnology II and animal cell culture II .



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- Student success in any course of study is estimated in one of the following estimates:

Excellent	From 90 to 100 degrees
Very Good	From 80 to less than 90 degrees
Good	From 70 to less than 80 degrees
Pass	From 60 to less than 70 degrees

- Successfully passes of both oral and written qualifying examinations.
- Approved completion of the research experiments.
- Approved scientific writing of Ph.D. dissertation.
- Successfully passes of dissertation open defense examination.

#### 8. Assessment methods for Evaluating program Applicants:

No.	Method	Intended Learning Outcomes ' ILO's '
1	Semester Works( 5 <sup>th</sup> &10 <sup>th</sup> )	Measure Problems Solving Skills, Presentation, and Self learning.
2	Midterm Exam (6 <sup>th</sup> ) Week.	Measure Abilities on Concentration and Understanding Scientific Points & Background.
3	Oral Exam (14 <sup>th</sup> ) Week.	Measure Analysis, Presentation and Discussion Skills.
4	Written (Final) Exam (15 <sup>th</sup> ) Week.	Measure Knowledge, Understanding, Intellectual and Professional skills.
5	PhD dissertation	To assess the ability to write a review of literature, perform the needed practical steps and to present the results in tables and graphs. In addition, the skills of analysis of results and discussion with previous findings obtained by other authors are also assessed.

#### 9. Program Evaluation methods:

No.	Evaluator	Tool	Sample
1	Students	Questionnaire	20
2	Alumni	Depth Meeting	5
3	Stakeholders (Employers)	Nucleus Meeting	5
4	External (Evaluators & Examiners)	Remarking Questionnaire & Nucleus Meeting	2
5	Others	Not Applied	-----



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## **Teaching and learning strategies:**

- 1- Active learning**
- 2- Outcome-based learning.**
- 3- Problem-based learning**
- 4- Self learning**

**Program coordinator: Assoc. Prof. Dr./ Osama Badr**

**Acting head of department: Prof. Dr./ Omaila KHAMISS**



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***Matrix of Knowledge and Skills of Animal Biotechnology Doctorate Program Targeted***

No.	Course No.	Course title	Knowledge and understanding skills							
			a	b	c	d	e	f	g	
1		<b>German Language</b>								X
2		<b>Research and Research Methodology</b>							X	
3	<b>A-24</b>	<b>Advanced biotechnology</b>								X
4	<b>A-81</b>	<b>Advanced Computer</b>								X
5	<b>B4-4</b>	<b>Animal cell culture II</b>		X						
6	<b>B4-27</b>	<b>Special Topics</b>							X	
7	<b>B4-28</b>	<b>Seminars</b>								X
1	<b>A-77</b>	Topics in cell and developmental biology	X							
2	<b>B4-26</b>	Transgenic animals	X							
3	<b>B4-16</b>	Intensive fish farming			X					
4	<b>B4-23</b>	Poultry Biotechnology.		X						
5	<b>B4-43</b>	Molecular cancer biology	X							
6	<b>B4-15</b>	Genetics and breeding of fish			X					
7	<b>B4-25</b>	Technologies in animal reproduction				X				
8	<b>B4-6</b>	Animal virus pathogenesis				X				
9	<b>B4-24</b>	Sex predetermination					X			
10	<b>B7-14</b>	Genomic Imprinting					X			
11	<b>B1-37</b>	Molecular biology of insects and Insect viruses		X		X				
12	<b>B1-20</b>	Genetic control of insects		X						
13	<b>C-52</b>	Methods and protocols in electron microscopy	X							
14	<b>C-26</b>	Electroporation protocols for microorganisms		X						
15	<b>C-64</b>	Immunology methods III				X				
16	<b>C-112</b>	Protocols and applications of DNA markers				X				
<b>PhD dissertation</b>			<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>





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***Matrix of Professional Skills of Animal Biotechnology Doctorate Program Targeted***

No.	Course No.	Course title	Professional and practical skills				
			a	b	c	d	e
1		<b>German Language</b>					<b>X</b>
2		<b>Research and Research Methodology</b>					<b>X</b>
3	<b>A-24</b>	<b>Advanced biotechnology</b>	<b>X</b>				
4	<b>A-81</b>	<b>Advanced Computer</b>					<b>X</b>
5	<b>B4-4</b>	<b>Animal cell culture II</b>			<b>X</b>		
6	<b>B4-27</b>	<b>Special Topics</b>					<b>X</b>
7	<b>B4-28</b>	<b>Seminars</b>					<b>X</b>
1	<b>A-77</b>	Topics in cell and developmental biology			<b>X</b>		
2	<b>B4-26</b>	Transgenic animals			<b>X</b>		
3	<b>B4-16</b>	Intensive fish farming				<b>X</b>	
4	<b>B4-23</b>	Poultry Biotechnology.				<b>X</b>	
5	<b>B4-43</b>	Molecular cancer biology				<b>X</b>	
6	<b>B4-15</b>	Genetics and breeding of fish			<b>X</b>		
7	<b>B4-25</b>	Technologies in animal reproduction	<b>X</b>				
8	<b>B4-6</b>	Animal virus pathogenesis					<b>X</b>
9	<b>B4-24</b>	Sex predetermination		<b>X</b>			
10	<b>B7-14</b>	Genomic Imprinting		<b>X</b>			
11	<b>B1-37</b>	Molecular biology of insects and Insect viruses				<b>X</b>	
12	<b>B1-20</b>	Genetic control of insects				<b>X</b>	
13	<b>C-52</b>	Methods and protocols in electron microscopy					<b>X</b>
14	<b>C-26</b>	Electroporation protocols for microorganisms					<b>X</b>
15	<b>C-64</b>	Immunology methods III			<b>X</b>		
16	<b>C-112</b>	Protocols and applications of DNA markers		<b>X</b>			
<b>PhD dissertation</b>			<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>



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**Matrix of General and transferable Skills of Animal Biotechnology Doctorate Program Targeted**

No.	Course No.	Course title	General and transferable skills							
			a	b	c	d	e	f	g	
1		<b>German Language</b>								
2		<b>Research and Research Methodology</b>	X							
3	<b>A-24</b>	<b>Advanced biotechnology</b>	X							
4	<b>A-81</b>	<b>Advanced Computer</b>				X				
5	<b>B4-4</b>	<b>Animal cell culture II</b>								
6	<b>B4-27</b>	<b>Special Topics</b>		X						
7	<b>B4-28</b>	<b>Seminars</b>		X						
1	<b>A-77</b>	Topics in cell and developmental biology						X		
2	<b>B4-26</b>	Transgenic animals			X					
3	<b>B4-16</b>	Intensive fish farming				X				
4	<b>B4-23</b>	Poultry Biotechnology.		X						
5	<b>B4-43</b>	Molecular cancer biology				X				
6	<b>B4-15</b>	Genetics and breeding of fish			X					
7	<b>B4-25</b>	Technologies in animal reproduction						X		
8	<b>B4-6</b>	Animal virus pathogenesis				X				
9	<b>B4-24</b>	Sex predetermination					X			
10	<b>B7-14</b>	Genomic Imprinting					X			
11	<b>B1-37</b>	Molecular biology of insects and Insect viruses	X							
12	<b>B1-20</b>	Genetic control of insects					X			
13	<b>C-52</b>	Methods and protocols in electron microscopy	X							
14	<b>C-26</b>	Electroporation protocols for microorganisms			X					
15	<b>C-64</b>	Immunology methods III					X			
16	<b>C-112</b>	Protocols and applications of DNA markers								
<b>PhD dissertation</b>			<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>



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**Program coordinator: Dr.**

**Head of department: Prof. Dr. Omaima KHAMISS**





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# ***II***

## ***Matrix between Program ARS and NAQAAE-ARS***

(March 2009)



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## 2.1 Knowledge & Understanding

ARS	ARS				
	2.1.1	2.1.2	2.1.3	2.1.4	2.1.5
3.1.1	X				
3.1.2		X			
3.1.3			X		
3.1.4				X	
3.1.5					X

## 2.2. Intellectual Skills

ARS	ARS								
	2.2.1	2.2.2	2.2.3	2.2.4	2.2.5	2.2.6	2.2.7	2.2.8	2.2.9
3.2.1	X								
3.2.2		X							
3.2.3			X						
3.2.4				X					
3.2.5					X				
3.2.6						X			
3.2.7							X		
3.2.8								X	
3.2.9									X

## 2.3.1 Professional Skills

ARS	ARS				
	2.3.1	2.3.2	2.3.3	2.3.4	2.3.5
3.3.1	X				
3.3.2		X			
3.3.3			X		
3.3.4				X	
3.3.5					X



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### 2.3.2 General and Transferable skills

ARS	ARS							
	2.4.1	2.4.2	2.4.3	2.4.4	2.4.5	2.4.6	2.4.7	2.4.8
3.4.1	X							
3.4.2		X						
3.4.3			X					
3.4.4				X				
3.4.5					X			
3.4.6						X		
3.4.7							X	
3.4.8								X



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