Program Title: Doctor of Philosophy in Veterinary Medical Sciences

(Genetics and Genetic Engineering)

A. ADMINISTRATIVE INFORMATION

University:	**Sadat City**
Faculty:	**Veterinary Medicine**
Program title:	**PhD in Veterinary Medical Sciences (Genetics and Genetic Engineering)**
Final award:	**PhD Degree in Veterinary Medical Sciences (Genetics and Genetic Engineering)**
Registration period	**3-5 years. An extension for a maximum of 3 years could be approved.**
Department responsible:	**Husbandry and Animal Wealth Development**
Program Coordinators:	**Dr. Hanim Shaban Heikal**
External evaluator:	**Dr. Abeer Elnahhas, Alex University**

B. PROFESSIONAL INFORMATION

1) Overall aims of program

- Allow graduate to create new knowledge and understanding in veterinary genetics and genetic engineering through the process of research and inquiry.
- Enable graduate to achieve competency in modern technology
- Provide the graduate with the opportunity to develop communication skills, recent techniques and tools in the field of veterinary genetics and genetic engineering and experience of scientific research skills.
- Giving the graduate the ability to be creative to advance veterinary genetics and genetic engineering through new scientific research.
- Enable graduate to achieve capability in modern technology to develop practical research project.
- Demonstrate an awareness of the connections between disciplines and develop the ability to engage critically with scientific literature and to critically review and present their own research data for genetic the improvement of the animal and poultry production.
- Have the ability of data statistical analysis, results interpretation and dissertation, presentation skills.
- Exhibit awareness about current Animal and Poultry genetic problems and mastering the identification of problems and finding solutions based on sound scientific research concepts by effective utilization of the available resources in addition to improving as well as offering new resources.
- Guarantee of veterinary professional practice regulations and ethics in the veterinary genetics and genetic engineering.

2) Academic standards

- Academic reference standards (ARS) adopted by the faculty committee No 152 (18/6/2014).

3) Graduate attributes

The graduate should have the ability for:

1) Mastering the basics and methodologies of scientific research veterinary genetics and genetic engineering for better dealing with genetic problems professionally.

2) Performing continuous effort to add knowledge about genetic improvement of animals and poultry productive and reproductive traits.

3) Analysis and craterization of information in veterinary genetics and genetic engineering and related fields including production, biochemistry, behavior,

economics, etc.

4) Integrating data collected from the animal and poultry farms with related experimental findings to reach the correct system for genetic improvement of animal and poultry production.
5) Showing deep awareness with the ongoing animal and poultry genetic problems and modern theories in solving genetic problems.
6) Identifying the main genetic causes of low production and infertility in animals and poultry farms and suggesting the appropriate solutions.
7) Mastering of a wide range of professional skills in experimental design, data collection, analysis, and interpretation of genetic data.
8) Acquiring trends towards developing modern methods and tools in veterinary genetics and genetic engineering.
9) Using appropriate technological means to serve professional practice.
10) Communicating effectively with animal breeders, students and colleagues and leading work team through professional scale.
11) Making decision in different professional situations especially under field conditions to deal with genetics of animals and poultry.
12) Using of the available resources efficiently in the development of new techniques and work to find new resources.
13) Being aware with his role in society development and community preservation.
14) Acting with integrity, credibility and according to the rules of profession.
15) Realizing the importance of self and life-long learning and progress.

4) Intended learning outcomes of course (ILOs)

a) Knowledge and understanding

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

a.1. Recognize recent theories, principles and knowledge in genetic and environmental improvement of animal and poultry production.
a.2. Apply Principles methodologies and ethics of scientific research and its tools in genetic improvement of productive and reproductive efficiency of animals and poultry
a.3. Define legal and ethical principles of the area of veterinary genetics and genetic engineering.
a.4. Recognize Principles and the basics of quality assurance the field of veterinary genetics and genetic engineering.
a.5. Apply knowledge and understanding in of veterinary genetics and genetic engineering for genetic improvement of animal and poultry production
a.6. Recognize the effect of different systems of genetic improvement on the animal wealth and methods for maximizing production
a.7. Describe the principles, methodologies and ethics of scientific research veterinary genetics and genetic engineering.

b) Intellectual skills

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

b.1. Assess and criticize different data and information in veterinary genetics and genetic engineering

b.2. Analyze and evaluate information about DNA fingerprinting animals and poultry and the eliciting from them

b.3. Solve professional genetic problems in animal and poultry production using available data under field or laboratory conditions.

b.4. Perform scientific research studies that can give significant impact on the genetic improvement of animal and poultry production.

b.5. Conduct scientific research studies aiming at enhance genetic value of animal and poultry.

b.6. Formulating scientific papers in veterinary genetics and genetic engineering with the ability to match and discuss his own findings with those of other scientists.

b.7. Asses risks in the field of veterinary genetics and genetic engineering.

b.8. Share and lead scientific open discussion in the field of veterinary genetics and genetic engineering based on evidences and proofs.

b.9. Planning to enhance the performance in the field of veterinary genetics and genetic engineering.

b.10. Make professional decisions and suggestions for genetic improvement of animal and poultry production under different professional contexts

b.11. Innovate new method or technique for genetic improvement of animal and poultry production.

b.12. Perform evidence-based discussion and conversation for his PhD defense

c) Professional and practical skills

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

c.1. Master the fundamental and recent professional skills in the field of veterinary genetics and genetic engineering including experimental design, data collection, presentation and analysis.

c.2. Write and evaluate professional genetic reports.

c.3. Evaluate and modernize methods and tools in genetic improvement of productive and reproductive traits of animal and poultry

c.4. Use modern technological means to serve genetic improvement of animal and poultry production.

c.5. Plan for the development of a research project in the field of veterinary genetics and genetic engineering taking in consideration the methodology, ethical and bio- safety with precise cost estimation and time frame required

d) General and transferable skill

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

d.1. Communicate effectively in different ways, including participation in workshops and seminars and utilizing the advanced information technology in the improvement of Animal and poultry production professional practice.
d.2. Utilize information technology to serve professional practice.
d.3. Teach others and evaluate their performance.
d.4. Self-evaluate and identify personal learning requirements
d.5. Lead team under different professional circumstances.
d.6. Use of different sources for obtaining information and knowledge.
d.7. Manage scientific meetings with the ability to manage time efficiently.

5) Program structure:

a) PhD courses for one year

1) Student should conduct for one year 3-4 courses (from the list below) proposed by both department council and approved by postgraduate and research committee and Faculty council.

- These courses must not be previously studied in the Mater program.
- At least one of these courses must be offered by Faculty departments rather than department of specialization.
- The total study hours (lectures and practical) for all courses are 12-15 hours/week.

b) PhD Thesis (at least two academic years)

- All PhD degree students should prepare a PhD thesis.
- 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 responsible for the program 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.

Elective Courses for master students				
Code	**Course**	**Hours/week**		**Department**
		Lecture	**Practical**	
601	Applied anatomy	**2**	**2**	**Anatomy & Embryology**
602	Arterial & nerve supply, and surface anatomy	**2**	**2**	
603	Osteology and arthrology	**2**	**2**	
604	Comparative digestive system	**2**	**2**	

605	Comparative urogenital system	**2**	**2**	
606	Comparative respiratory System	**2**	**2**	
607	Comparative cardiovascular system, lymphatic system and heart	**2**	**2**	
608	Comparative nervous system and endocrine glands	**2**	**2**	
609	General and special embryology	**2**	**2**	
610	Avian anatomy	**1**	**2**	
611	Cytology and cytochemistry	**2**	**2**	**Cytology and histology**
612	General histology	**2**	**2**	
613	Histological and histochemical structure of blood, lymphatic & cardiovascular systems and heart	**2**	**2**	
614	Histological and histochemical structure of respiratory system	**2**	**2**	
615	Histological and histochemical structure of digestive system	**2**	**2**	
616	Histological and histochemical structure of urogenital system	**2**	**2**	
617	Histological and histochemical structure of nervous system and endocrine glands	**2**	**2**	
618	Histological and histochemical structure of integument, hoof, claws and nails	**2**	**2**	
619	Avian histology	**2**	**2**	
620	Circulatory and immune systems	**2**	**2**	
621	Physiology of endocrine glands & reproduction in mammals	**2**	**2**	**Physiology**
622	Avian physiology (advanced)	**2**	**2**	
623	Fish physiology	**1**	**2**	
624	Nerve and muscle physiology	**2**	**2**	
625	Ruminant physiology	**2**	**2**	
626	Physiology of environment, adaptation, and cell	**2**	**2**	
627	Physiology of blood and immunity system	**2**	**2**	
628	Physiology of digestion, metabolism and energy	**2**	**2**	
629	Physiological changes associated with pollution	**1**	**2**	
630	Radioisotopes and their biological uses	**2**	**2**	
631	Biochemistry (advanced)	**2**	**2**	**Biochemistry and Chemistry of Nutrition**
632	Metabolism	**1**	**2**	
633	Biochemistry of tissues and body fluids	**2**	**2**	
634	Biochemistry of hormones and reproduction	**2**	**2**	
635	Chemistry of nutrition	**2**	**2**	
636	Clinical biochemistry	**2**	**2**	
637	Avian biochemistry	**2**	**2**	
638	Fish biochemistry	**2**	**2**	
639	Microbial biochemistry and biotechnology	**2**	**2**	
640	Radiation biochemistry	**1**	**2**	
641	Behaviour and management of ruminants	**2**	**3**	**Husbandry and Animal Wealth Development**
642	Behaviour and management of equines	**2**	**3**	
643	Pet animal behaviour and management	**1**	**2**	
644	Laboratory animal behaviour and management	**1**	**2**	
645	Wild animals and birds behaviour and management	**2**	**2**	
646	Bird and rabbit behaviour and management	**2**	**2**	
649	Animal nutrition (advanced)	**2**	**2**	**Nutrition and Clinical Nutrition**
650	Feed stuffs (components and additives)	**2**	**2**	
651	Farm animals and fish nutrition	**2**	**2**	
652	Birds and rabbit nutrition	**2**	**2**	

653	Nutrition of wild animals	**1**	**2**	
654	Laboratory animal nutrition	**1**	**2**	
655	Feed stuff analysis	**2**	**2**	
656	Feeds and feed industry hygiene	**2**	**2**	
657	Clinical nutrition	**2**	**2**	
659	General pathology and oncology (advanced)	**2**	**2**	**Pathology**
660	Pathology of microbial and parasitic animal diseases	**2**	**2**	
661	Pathology of nutritional deficiencies	**1**	**2**	
662	Environmental pathology	**1**	**2**	
663	Pathology of reproduction	**1**	**2**	
664	Pathology of poultry	**2**	**2**	
665	Fish pathology	**1**	**2**	
666	Experimental Pathology	**1**	**2**	
667	Toxicological pathology	**2**	**2**	
668	Surgical pathology	**2**	**2**	
669	Clinical pathology (advanced)	**2**	**2**	**Clinical Pathology**
670	Evaluation of organ functions, body fluids balance and urine	**2**	**2**	
671	Diagnosis of hematological disorders and bone marrow investigation	**1**	**2**	
672	Bacteriology (general)	**1**	**2**	**Bacteriology, Mycology and Immunology**
673	Bacteriology (special)	**2**	**3**	
674	Immunology (advanced)	**1**	**2**	
675	Mycology (advanced)	**2**	**3**	
676	Microbiology of fish	**2**	**2**	
677	Microbiology of birds and rabbits	**1**	**2**	
678	Microbiology of invertebrates	**1**	**2**	
679	Diagnostic microbiology	**2**	**2**	
680	General virology	**1**	**2**	**Virology**
681	Special virology	**2**	**2**	
682	Viral immunology	**1**	**2**	
683	Viral vaccines	**2**	**3**	
684	Veterinary medical entomology	**2**	**2**	**Parasitology**
685	Helminthology	**2**	**2**	
686	Protozoology	**2**	**2**	
687	Parasites of birds	**2**	**2**	
688	Parasites of fish	**2**	**2**	
689	Snails and their veterinary significance	**1**	**2**	
690	Parasitic immunology	**1**	**2**	
691	Clinical parasitology	**2**	**2**	
692	Parasites of wild animals	**1**	**2**	
693	Specific parasitology (advanced)	**2**	**2**	
694	Veterinary pharmacology (General Advanced)	**2**	**2**	**Pharmacology**
695	Veterinary pharmacology, autonomic nervous system and local hormones	**2**	**2**	
696	Veterinary pharmacology and CNS	**2**	**2**	
697	Veterinary pharmacology and anaesthesia	**2**	**2**	
698	Veterinary pharmacology and systems	**2**	**2**	
699	Veterinary pharmacology and metabolism	**2**	**2**	
700	Pharmaceutical hormones	**2**	**2**	
701	Chemotherapy	**2**	**2**	
702	Drug toxicity	**1**	**2**	
703	Biological evaluation of drugs	**1**	**1**	
704	Dairy hygiene and control (advanced)	**2**	**2**	**Food hygiene**

705	Dairy microbiology	**2**	**2**	
706	Dairy technology and preservation	**2**	**2**	
707	Food analysis (specific courses)	**2**	**2**	
708	Specific courses in milk contamination and diseases transmitted by milk and hygiene of eggs, oils and fats	**1**	**2**	
709	Food poisoning	**1**	**2**	
710	Hygiene and control of dairy plants	**2**	**2**	
711	Hygiene of slaughter animal	**1**	**2**	**Food hygiene**
712	Hygiene and management of abattoirs	**2**	**2**	
713	Meat Hygiene and control	**2**	**2**	
714	Bird and rabbit meat hygiene	**1**	**2**	
715	Food technology	**1**	**2**	
716	Food microbiology	**2**	**2**	
717	Microbiology of animal byproducts	**1**	**1**	
718	Microbiology of fish and crustaceans	**1**	**2**	
718	Meat and fish analysis	**1**	**2**	
719	Hygiene and control of meat and fish plants	**2**	**2**	
720	General medicine (advanced)	**2**	**2**	**Medicine and infectious diseases**
721	Ruminant animal medicine	**2**	**2**	
722	Equine medicine	**2**	**2**	
724	Pet animal medicine	**2**	**2**	
725	Wild animal medicine	**2**	**2**	
726	Metabolic diseases	**2**	**2**	
727	Nutritional deficiency diseases	**2**	**2**	
728	Dermal diseases	**1**	**2**	
729	Diseases of newly born animals	**2**	**2**	
730	Cattle infectious diseases	**1**	**2**	**Medicine and infectious diseases**
731	Sheep and goat infectious diseases	**2**	**2**	
732	Camel infectious diseases	**2**	**2**	
733	Equine infectious diseases	**2**	**2**	
734	Pet animal infectious diseases	**2**	**2**	
735	Laboratory animal infectious diseases	**1**	**2**	
736	Udder and calve infectious diseases	**2**	**2**	
737	Buffalo infectious diseases	**1**	**1**	
738	Wild animal infectious diseases	**1**	**1**	
739	Forensic medicine and veterinary regulations	**2**	**2**	**Forensic Medicine, Toxicology, ,and Veterinary regulations**
740	General toxicology	**2**	**2**	
741	Environmental toxicology	**2**	**2**	
742	Forensic toxicology	**2**	**2**	
743	Clinical toxicology	**2**	**2**	
744	Gynaecology (specific courses for ruminants, equines and pet animals)	**2**	**2**	**Theriogenology**
745	Andrology (specific courses for ruminants and pet animals)	**2**	**2**	
746	Obstetrics and diseases in animals	**2**	**2**	
746	Reproduction and immunity	**1**	**2**	
747	Artificial insemination in ruminants	**2**	**2**	
748	Artificial insemination in equines	**2**	**2**	
749	Artificial insemination in birds and pet animals	**1**	**2**	
750	Artificial insemination in rabbit	**1**	**2**	
751	Embryo transfer	**1**	**2**	
752	obstetrics and artificial insemination in wild animals	**1**	**2**	
753	General surgery (advanced)	**2**	**2**	**Surgery, Anesthesiology**
754	Special surgery (organs)	**2**	**2**	

755	Ophthalmic surgery	**2**	**2**	**and Radiology**
756	Surgery of the digestive system	**2**	**2**	
757	Surgery of limbs and diseases of hoof & claw	**2**	**2**	
758	Experimental surgery	**2**	**2**	
759	Anesthesiology	**1**	**1**	
760	Diagnostic imaging	**2**	**2**	
761	Bacterial diseases of poultry	**2**	**2**	**Bird and Rabbit Medicine**
762	Viral diseases of poultry	**2**	**2**	
763	Mycotic diseases of poultry	**2**	**2**	
763	Parasitic diseases of poultry	**1**	**2**	
764	Nutritional deficiency diseases	**1**	**2**	
765	Wild and migratory birds diseases	**1**	**2**	
766	Rabbits diseases (advanced)	**2**	**2**	
767	Prevention in poultry field	**2**	**2**	
768	Laboratory diagnosis of poultry diseases	**2**	**2**	
769	Farm animal hygiene (advanced)	**2**	**2**	**Hygiene and Zoonoses**
770	Poultry hygiene (advanced)	**2**	**2**	
771	Environmental hygiene and pollution	**2**	**2**	
772	Combating epidemic diseases	**2**	**2**	
773	Control of pests and disease vectors	**2**	**2**	
774	Insecticides and animal hygiene	**2**	**2**	
775	Animal farm hygiene	**2**	**2**	
776	Disinfection and disinfectants	**2**	**2**	
777	Epidemiology of animal and bird diseases	**2**	**-**	
778	Zoonoses - advanced	**2**	**2**	**Hygiene and Zoonoses**
779	Role of rodents in transmission of zoonotic diseases	**2**	**2**	
780	Role of wild animals in transmission of zoonotic diseases	**2**	**2**	
781	Epidemiology of zoonotic diseases	**2**	**-**	
782	Prevention and control of zoonotic diseases	**2**	**-**	
783	Role of aquatic animals and fish in transmission of zoonotic disease	**2**	**-**	
784	Genetic of microorganisms	**1**	**2**	**Husbandry and Animal Wealth Development**
785	Genetic engineering (advanced)	**1**	**2**	
786	Cytogenetics	**1**	**-**	
787	Population genetics (advanced)	**2**	**-**	
788	Physiological genetics	**2**	**-**	
789	Biochemical and radiation Genetics	**1**	**2**	
790	Advanced animal breeding and improvement (advanced)	**2**	**-**	**Husbandry and Animal Wealth Development**
791	Advanced poultry breeding and improvement (advanced)	**2**	**-**	
792	Advanced cattle and buffalo production (advanced)	**2**	**2**	
793	Advanced sheep and goat production (advanced)	**2**	**2**	
794	Advanced poultry production (advanced)	**2**	**2**	
795	Advanced rabbit production (advanced)	**2**	**2**	
799	Economics of production and dairy farms	**2**	**-**	**Husbandry and Animal Wealth Development**
800	Economics of poultry farms	**2**	**-**	
801	Economics of fish farms	**2**	**-**	
802	Feasibility studies	**2**	**-**	
803	Animal farm management	**2**	**-**	
804	Economics of beef production farms	**2**	**-**	
811	Microbial aquatic diseases (specific courses)	**3**	**3**	**Fish Medicine and Management**
812	Parasitic aquatic diseases (specific courses)	**3**	**3**	
813	Non-infectious aquatic diseases (specific courses)	**3**	**3**	
814	Epidemiology of aquatic diseases	**2**	**1**	
815	Aquaculture	**3**	**1**	

816	Special studies in aquatic sciences	**2**	**2**	

6) Teaching and Learning Methods

The program features a variety of teaching approaches for different intended learning objectives including:

- Lectures
- Practical and lab sessions
- Self-learning activities

7) Student assessment

The program depends on different assessment ways:

a. Course assessment:

1- Written examination	For assessment of knowledge, back calling and Intellectual skills
2- Practical examination	For assessment of practical and professional skill.
3- Oral examination	For assessment of knowledge and Intellectual skills
4- Student activities	For assessment of knowledge and general and transferable skills

b. PhD Thesis assessment

- Annual reports adopted by the Faculty.
- Finally, the assessment of thesis measure the individual student ability to work independently in the field specialization.
- Final evaluation and approval by a judging committee of at least three professors including one or more of the supervisors and an external professor. This assesses the ability to write a review article, 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.

Assessment of program intended learning outcomes

Tool or method	ILOs
Written	**a1-7; b2,3,7,9;**
Oral	**a1,2,5,7; b2,10,11,12**
Practical	**b1,2,3,7,12; C1-5;**
Assignments	**a1,2; b8,b10,11; d-7**
Thesis	**a1-7, b1-12, c1-5, d1-7**

8) 6-Score classification:

Excellent	At least 90% and more
Very good	At least 80% and less than 90%
Good	At least 70% and less than 80%
Pass	At least 60% and less than 70%
Fail	Less than 60%

9) Program admission requirements

- The Applicant must normally satisfy the Faculty of Veterinary Medicine University of Sadat City general entrance and requirement. The normal minimum entrance qualification for registration at the Faculty on a PhD program:
  - Master degree in Veterinary Medical Sciences (Genetics and Genetic Engineering) of one of the Egyptian Universities or
  - hold an equivalent degree from another recognized scientific institute.

10) Regulations for progression of program

a) Registration period for the PhD program in Veterinary Medical Sciences is at least 3 years after the approval date by the Faculty council. The registration period should not exceed 5 years. An extension for a maximum of 3 years could be approved by the Faculty council depending on the supervisor report approved by the department council and the postgraduate and research committee in the Faculty. The total period must not be more than 8 years.

b) <u>The general conditions for having a PhD degree in Veterinary Medical Sciences include:</u>

1) The student should pass written, practical and oral exams successfully in all courses. Examination is held twice a year (December and April). The student will entitled to apply for the exam only after meeting attendance rate for each course.

- Failure or depriving from entering one or more course did not requires reexamination in successful passed courses.
- Each student has 4 chances to enter the exams, and the Faculty council should deprive the student from entering the exam if his attendance rate in the course is less than 75%.
- Failure or depriving from entering one course requires both restudying the course and reexamination.

- Time of written exam is 3 hours if the total study hours of the course are 3 hours or more per week. In case of a course with total study hours less than 2 per week, the time of written exam is 2 hours
- The final marks for each course having 3 study hours (lecture and practical) per week is 100 and 50 marks for any course with less than 3 study hours. The marks are divided into 50% for written exam, and 50% for both practical and oral exams.

2) The applicant should conduct an innovate research on the concerned subject for at least 3 years from the date of registration approved by the faculty council. And the faculty council depending on a request from the supervisor has the right to authorize the student to do scientific experiments at recognized scientific institute.

3) The applicant should submit a seminar about his research and specialization subject field that accepted by the committee of professors and assistant professors in the department.

4) The applicant should submit the PhD thesis accepted by the judging committee in an open discussion and the following policies should be met passed all supplementary curriculums and acceptance of the seminar presented by the applicant.

- The applicant should submit 5 copies of the thesis for the department council to choose the judging and discussion committee which will be approved by postgraduate and research committee and Faculty council.
- After the validity of thesis is approved by the judging and discussion committee, 6 copies of the thesis must be presented to Faculty library and one for the general library of the University, then approval sheet will be approved by postgraduate and research committee and Faculty council.

c) <u>General rules</u>

1) The PhD certificate must indicate the thesis topic and the field of specialization.

2) Applications for registration should be sent during March and September each year.

3) The applicant should submit a request enrolment for the Faculty dean who forwards it to the concerned department council to determine the research subject and the study program and then take calendar after complete documentation on the Faculty council for approval.

4) The thesis title should be identified at least 2 months before being submitted, and the judging committee has the right to amend the title without prejudice the subject of research.

5) The Faculty council has the right to suspend the student enrolment for a certain period if he has acceptable excuse preventing him from continuing his study or research, and his period will not counted.

6) Registration will be cancelled in one of the following cases:

- If the supervisor report during the registration period is unsatisfactory
- If student did not submit his thesis before the end of registration period.
- If the judging and discussion committee rejected the thesis twice.

7) The applicant should submit 10 copies of the thesis after its validity is approved by the judging and discussion committee to be distributed to the committee members and Faculty library and the judging and discussion committee may decide the exchange of the thesis with other universities or printing at the expense of the university.

	Program coordinators	Head of department
Name	Dr. hanim shaban heikal	Prof. Dr. Hamada dahi
Signature		

Matching program ILOs with ARS - Matrix

Program ILOs	ARS																										
	K&U (a)						I.S. (b)									P.P. (c)					G.T. (d)						
	١	٢	٣	٤	٥	٦	١	٢	٣	٤	٥	٦	٧	٨	٩	١	٢	٣	٤	٥	١	٢	٣	٤	٥	٦	٧
K&U	١ ٢	٣	٤	٥	٦	٧																					
I.S.							١ ٢	٣	٤ ٥	٦	٧	٨ ٩	١٠	١١	12												
P.P.																١	٢	٣	٤	٥							
G.T.																					١	٢	٣	٤	٥	٦	٧

Program Specification Matrix

PhD in Veterinary Medical Sciences (Veterinary Genetics and Genetic Engineering)

Name of student: هانم شعبان محمد هيكل **Registration date: Sept. 2008**

Courses		Total Contact hours/ course	No. of hours / week			K.U (a)							I.S (b)												P.P (c)					G.T (d)						
Code	Name		Lect.	Lab.	Total	١	٢	٣	٤	٥	6	7	1	2	3	4	5	6	7	8	9	10	11	12	١	٢	٣	٤	٥	1	2	3	4	5	6	7
784	**Genetic of microorganisms**	١٧٦	٢	٢	٤	x	x	x	x	x			x		x				x	x	x	x	x		x	x	x			x	x	x	x	x		x
787	**Population genetics (advanced)**	٨٨	٢	-	٤	x	x	x	x	x	x		x		x				x	x	x	x	x		x	x	x			x	x		x	x	x	x
x	**Advanced cattle and buffalo production**	**176**	٢	٢	٤		x	x	x	x	x								x				x		x	x		x		x	x	x	x	x	x	
639	**Microbial biochemistry and biotechnology**	١٧٦	٢	٢	٣	x			x					x					x				x		x	x	x			x		x	x	x	x	x
Total		٦١٦	٨	٦	١٤																															
Thesis						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	xx	x