Animal Breeding and Production Course Specification

Basic Information		
Course Code	2AAPRO, 2BAPRO	
Course Title	Animal Breeding and Production	
Academic Year	Second	
Academic Program	Bachelor of Veterinary Sciences	
Hours/week	Lectures: 2	Practical: 3
Term	First & Second	

1. Course Aim

By the end of this course, students should have gained the basic concepts, principles and the essential practical skills in the field of cattle, buffalo, sheep and goat production and genetic improvement. The major topics covered are evaluation of performance, genetic description of populations and their improvement, management, industry structure, production systems and current and future issues.

2. Intended Learning Outcomes

2.1. Knowledge and Understanding

On successful completion of this course, the student should be able to
2.1.1. Define the basic terms in the fields of population genetics and production systems.
2.1.2. Give examples of farm animal types and breeds suitable for various production purposes.
2.1.3. Describe genetically an animal population for a simply-inherited trait.
2.1.4. Discuss the basic principles of genetic approaches for positive change of animal populations.
2.1.5. Outline the reproduction–production cycles of cattle, buffaloes, sheep and goats under intensive farming systems.
2.1.6. Explain the characteristics of a profitable dairy cattle enterprise with reference to local conditions.
2.1.7. Discuss in brief the requirements, breeding and production characteristics of an efficient sheep and goat flocks.
2.1.8. Review factors affecting growth performance of feeder cattle.
2.1.9. Describe beef carcass cutting and factors affecting meat palatability.

2.2. Intellectual Skills

By the end of this course, the student should be able to
2.2.1. Choose the proper approach for genetic improvement relative to economic priority in different species.
2.2.2. Discriminate reasons and sources of production inefficiency in meat and milk animals.

2.2.3. Interpret sire summaries and efficiency indices for herd/flock evaluation and enhancement.
2.2.4. Manipulate the development in animal production, e.g. biotechnology into practical needs.
2.2.5. Modify management and breeding schedules in response to emerging and unexpected problems.
2.2.6. Infer cattle, sheep and goat breeds and production systems relevant to the Egyptian socio–economics and resource availability.

2.3. Practical and Professional Skills

By the end of this course, the student should be able to
2.3.1. Estimate genetic values needed for description of animal populations.
2.3.2. Calculate farm efficiency indices from current and retrospective performance data.
2.3.3. Apply sound management practices to newborn, growing and mature animals,
2.3.4. Identify Egyptian and standard breeds of cattle, buffaloes, sheep and goats in a slideshow.
2.3.5. Judge animals based on their production and physical type,
2.3.6. Determine herd/flock housing, space, and equipment requirements in relation to a specified production system.

2.4. General and Transferable Skills

By the end of this course, the student should be able to
2.4.1. Deal ethically with faculty staff, colleagues and farm owners/workers/employees.
2.4.2. Use personal computer in editing and presentations.
2.4.3. Search the web for a given course topic to build up a short review.
2.4.4. Demonstrate personal skills such as communication, problem solving and teamwork skills.

3. Course Contents

First Semester

Topic	Total (hr)	Lectures (hr)	Practical (hr)	ILOS shared			
				KU	IS	PP	GT
A. Course description	1	1	—				
B. Breeding for genetic improvement of animal populations							
▪ Genetic description of animal populations	6	3	3				
▪ Ways of changing gene frequency and how are animal populations improved	11	3	8	2.1.1	2.2.1		
▪ Variation in economic traits in farm animals	2	2	—	2.1.3	2.2.4	2.3.1	
▪ Relationship and mating systems	6	2	4	2.1.4	2.2.5		
▪ Mating systems – outbreeding and hybrid vigor	5	1	4				
▪ Biotechnology and animal breeding	2	2	—				

C. Dairy Cattle Production – Part I							
▪ An introduction to dairy cattle industry ▪ Dairy cattle breeds	5	1	4	2.1.1 2.1.2	2.2.2 2.2.5	2.3.3 2.3.4	
▪ Heifer raising and herd replacement	10	5	5	2.1.5 2.1.6	2.2.6	2.3.6	
▪ Herd health	2	1	1				
D. Sheep and goat production							
▪ Developing a sheep flock enterprise	4	1	3				
▪ Breeds of sheep and goats	4	–	4				
▪ Reproduction, breeding program and selection in sheep and goats	8	5	3	2.1.2 2.1.5 2.1.7	2.2.2 2.2.5 2.2.6	2.3.2 2.3.3 2.3.4 2.3.6	
▪ Sheep flock management calendar ▪ Care of the ewe and newborn lamb	4	–	4				
▪ Wool and mohair production	3	2	1				
▪ Understanding dairy goat production	2	1	1				
▪ Student activities o Field trips to commercial and governmental farms (group activity) o Mini reviews from the web and the library (individual activity) o Presentations and seminars (individual activity) o Illustrative posters (group activity)	—	—	—				2.4.1 2.4.2 2.4.3 2.4.4

Second Semester							
Topic	**Total (hr)**	**Lectures (hr)**	**Practical (hr)**	**ILOS shared**			
				KU	**IS**	**PP**	**GT**
E. Dairy Cattle Production – Part II							
▪ Reproductive performance of dairy cattle	10	4	6				
▪ Milk Production - Normal pattern of milk production, and factors affecting yield and composition of milk including biotechnology.	6	4	2				
▪ Milking Production - Mammary gland structure and milking procedure	5	—	5	2.1.1 2.1.6	2.2.2 2.2.3 2.2.4	2.3.2 2.3.3 2.3.5	
▪ Managing the dry cow	2	2	—				
▪ Selecting and judging dairy cattle	5	—	5				
▪ Selecting dairy sires	4	1	3				
▪ Cattle Identification and herd records	3	—	3				

▪ Standardizing lactation records	4	—	4		
F. Beef Cattle Production					
▪ Principles and guides for efficient beef cattle production	7	3	4	2.1.2 2.1.5 2.1.8 2.1.9	2.2.2 2.2.5 2.2.6
▪ Use of growth promoters and hormone implants in beef cattle	2	2	—		
▪ Breeds of beef cattle	2	—	2		
▪ Systems of beef cattle production	2	1	1		
▪ Crossbreeding systems in beef cattle production	3	2	1		
▪ Growth and development of beef cattle	2	2	—		
▪ Beef cattle housing and equipments	4	1	3		
▪ Receiving program and marketing feeder cattle	5	3	2		
▪ Beef carcass cutting	2	2	—		
▪ Carcass characteristics affecting beef palatability	3	2	1		
▪ Measuring beef quality	4	1	3		
▪ Student activities ○ Field trips to commercial and governmental farms (group activity) ○ Mini reviews from the web and the library (individual activity) ○ Presentations and seminars (individual activity) ○ Illustrative posters (group activity)	—	—	—		
Total (2 semesters)	150	60	90		

2.3.2 2.3.3 2.3.4 2.3.5 2.3.6	
	2.4.1 2.4.2 2.4.3 2.4.4

* Contents sharing in the achievement of the intended learning outcomes; KU (knowledge and understanding), IS (intellectual skills), PPS (practical and professional skills) and GT (general and transferable skills).

Course Matrix for achievement of Intended Learning Outcomes

	Topics	Hours	Knowledge & Understanding									Intellectual Skills						Practical & Professional Skills						General & Transferable Skills			
			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4
1	A. Course description	1																									
2	B. Breeding for genetic improvement of animal populations	32	X		X	X						X			X	X		X									
3	C. Dairy Cattle Production – Part I	17	X	X			X	X					X			X	X			X	X		X					
4	D. Sheep and goat production	25		X			X		X				X			X	X		X	X	X		X					
5	E. Dairy Cattle Production – Part II	39	X					X					X	X	X				X	X		X						
6	F. Beef Cattle Production	36		X			X			X	X		X			X	X		X	X	X	X	X					
7	Student activities																							X	X	X	X

4. Teaching and Learning Methods	
Lectures:	Interactive lectures involving: • Student share in discussing various topics. • The use of datashow for demonstration of electronic slides and scientific videos.
Practical sessions:	• Electronic slideshows. • Video shows. • Training on animals of the faculty farm.
Self-Learning activities:	• Field trips to commercial and governmental farms (group activity) • Mini reviews from the web and the library (individual activity) • Presentations and seminars (individual activity) • Illustrative posters (group activity).

5. Teaching and Learning Methods for Students of Limited Capabilities

- Activating office hours.
- Additional revisions for previously taught and difficult topics.
- Providing a summary for previous chapter at the end of each one.
- Following up student feedbacks.

	6. Student Assessment			
	Intended Learning Outcomes Covered			
6.1. Methods	**KU**	**IS**	**PPS**	**GTS**
Written exams	2.1.1/2.1.2/2.1.3/ 2.1.4/2.1.5/2.1.6/ 2.1.7/2.1.8/2.1.9/	2.2.3/2.2.5/		
Practical exams			2.3.1/2.3.2/2.3.3/ 2.3.4/2.3.5/2.3.6/	
Oral exams		2.2.1/2.2.2/2.2.4/ 2.2.6/		2.4.1/2.4.4/
Student activities				2.4.1/2.4.2/2.4.3/ 2.4.4/

KU, knowledge and understanding; IS, intellectual skills; PPS, practical and professional skills; GTS, general and transferable skills.

6.2. Exam Description	
Written exams	• Short essays. • Drawings. • Multiple choice questions. • True or false. • Comparisons. • Giving the scientific term/information.
Practical exams	• Slideshow exams. • Record designs and evaluation. • Practical case studies. • Exams on animals of the faculty farm.
Oral exams	• The exam committee involves at least 2 examiners. Each evaluates the student by giving a separate score. The scores are then averaged. • Examiners are provided with the course specification. • The student randomly selects question cards.
Student activities	• Self-learning activities are evaluated throughout the semester. For details, refer to the section: "*4. Teaching and Learning Methods".*

	6.3. Assessment Schedule	6.4. Weighing of Assessments	
Exams and activities	**Week (in each semester)**	**Per semester**	**Total (%)**
Semester work exam	4th, 8th and 12th	8	16
Student activities	Throughout the semester	2	4
Final written exam	16th	25	50
Final Practical exam	16th	10	20
Final oral exam	16th	5	10
Total		50	100

7. List of References

7.1. Course Notes

❖ Elsheikh, A.I. and Elmaghraby, M.M.A. 2008. Animal Breeding and Production. Departmental Notes, Faculty of Veterinary Medicine, Alexandria University.

7.2. Essential Books

❖ Taylor, R.E., 2002. Scientific Farm Animal Production. 7th Ed., Upper Saddle River, New Jersey, USA.

❖ Phillips, C.J.C., 2001. Principle of Cattle Production. CAB International Wallingford, Oxon Ox10 8De, UK.

❖ Falconer, D. and Mackay, T., 1996. Introduction to Quantitative Genetics. 4th Edition. Longman.

7.3. Recommended Books

- Gillespie, J.R., 1997. Modern Livestock and Poultry Production. 5th Ed. Delmar Publishers. An International Thomson. Publishing Company, London.
- Bath D.L., Dickinson F.N., Tucker H.A., Appleman R.D., 1985. Dairy Cattle – Principles, Practices, Problems, Profits, 3rd Ed., Lea and Febiger, Philadelphia PA.
- Larson, B.L., 1985. Lactation. Iowa State University Press/ Ames, Iowa.
- Simm, G., 1998. Genetic Improvement of cattle and sheep. Farming Press, Miller Freeman, UK, Ltd.

7.4. Periodicals, websites, etc.

Scientific Journals

- Tropical Animal Health and Production
- Journal of Animal Science
- Livestock Production Science
- British Journal of Animal Science

Scientific websites

- Lactation Biology: http://classes.aces.uiuc.edu/ansci308/index.html
- National Dairy Database: http://www.inform.umd.edu:8080/edres/topic/agr/ndd
- The Babcock Institute: http://babcock.cals.wisc.edu
- Dairy Site form Purdue University: http://www.anr.ces.purdue.edu/anr/anr/dairy/frame.htm
- Dairy Nutrition Home. Pennsylvania State University: http://www3.das.psu.edu/dcn/
- WWW Virtual Library for Dairy Production* (Oklahoma). http://www.ansi.okstate.edu/library/dairy/
- Dairy Purdue: http://www.anr.ces.purdue.edu/anr/anr/dairy/frame.htm
- Dairy Cattle Information (NorthCarolina): http://mcdowell.ces.state.nc.us/staff/mdeluca/pages/dairy.shtml
- US Dairy Export Council: http://www.usdec.org/about/whoweare.htm
- Organizations Associated with Dairy Production: http://www.ansi.okstate.edu/library/dairy/organiz.htm#organ
- The International Dairy Federation (IDF): http://www.fil–idf.org/
- Dairy Biz: http://www.dairybiz.com/
- Feeding the Newborn Dairy Calf On–line Slide Show: http://www3.das.psu.edu/dcn/calfmgt/index.html
- Managing of dairy heifers : http://www3.das.psu.edu/dcn/calfmgt/385/index.html
- Management Practices Associated with High–Producing U.S. Dairy Herds (USDA): http://www.aphis.usda.gov/vs/ceah/cahm/Dairy_Cattle/drymgmt.htm
- Recommended Milking Procedures (US National Mastitis Council): http://www.nmconline.org/milkprd.htm

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