

General Program for Ph.D. in Zoology

[10 Compulsory credit hours (C.H.) + 8 Optional C. H.

in Specialization + 6 C. H. Research]

The Compulsory C. H. (10) :

Course number		Course title	No. of units
611	Zoo	Applied Entomology & Parasitology-1	2 (2+0)
621	Zoo	Advanced Aquatic Fauna	2 (2+0)
631	Zoo	Comparative Reproductive Physiology	2 (2+0)
641	Zoo	Advanced Cell Biology	2 (2+0)
671	Zoo	Advanced Animal Ecology and Pollution	2 (2+0)
			10 units

The Optional units in specialization (8) :

Course number		Course title	No. of units
612	Zoo	Advanced Entomology	2 (2+0)
613	Zoo	Parasite Culture	2 (2+0)
614	Zoo	Selected Topics in Entomology or Parasitology	2 (2+0)
622	Zoo	Aquatic vertebrates	2 (2+0)
623	Zoo	Nutrients requirement and Metabolism in Fishes	2 (2+0)
624	Zoo	Bioeconomics of Fisheries	2 (2+0)
635	Zoo	Advanced Animal Behaviour	2 (2+0)

638	Zoo	Advanced Topics in Physiology	2 (2+0)
639	Zoo	Current Topics in Developmental Biology	2 (2+0)
642	Zoo	Advanced Cytology-1	2 (2+0)
643	Zoo	Functional Histology	2 (2+0)
651	Zoo	Molecular Genetics	2 (2+0)
672	Zoo	Terrestrial Animal Ecology	2 (2+0)
673	Zoo	Aquatic Animal Ecology	2 (2+0)
674	Zoo	Advanced Studies in Pollution	2 (2+0)
691	Zoo	Seminar	2 (2+0)
			32 units

Termination Levels

Course number		Course title	No. of units
700	Zoo	Thesis	6 (0+6)
			6 units

Courses description

The Compulsory C. H. (10) :

Zoo 611	Applied Entomology & Parasitology -1- 2 (2+0)
Contents	Advanced economical and pathological survey of arthropods and other parasites. Advanced studies on the arthropods of their economic importance. Advanced studies on the pathogenesis of some diseases caused by or transmitted by arthropods. Advanced studies on the pathogenesis of some parasitic diseases of man and his domesticated animals.
Zoo 621	Advanced Aquatic Fauna 2 (2+0)
Contents	Recent advances in aquatic animal characteristics, phylogeny, adaptations, zoogeography and reproductive strategies.
Zoo 631	Comparative Reproductive Physiology 2 (2+0)
Contents	Comparative study of reproduction in fishes, amphibians, reptiles, birds and mammals, including the male and female reproductive systems, reproductive cycle, gametogenesis and fertilization, care of the embryo and fetus and their expulsion, and the effect of environment on reproduction.
Zoo 641	Advanced Cell Biology 2 (2+0)
Contents	The cell as a cytotoxic testing system. Labelling the cell molecules. Cell fusion by inactivated viruses and by polyethylene glycol. Study of specialized cells and cells in cultures. Immunogenetics and the major histocompatibility complex.
Zoo 671	Advance Animal Ecology and pollution 2 (2+0)
Contents	Species diversity, community structure and diversity, predators and predation, aquatic community regulation. Habital types. Feeding mechanisms, factors controlling diversity. Fresh waterwetland, Mangroove manglas, inorganic pollutants, organic pollutants, biological pollutants and physical pollutants.

The Optional units in specialization (8) :

Zoo 612	Advanced Entomology	2(2+0)
Contents	<p>Morphological and physiological adaptation of insects. Habitat problems of insects, respiration and osmoregulation.</p> <p>Organization of the nervous and muscular systems.</p> <p>Neurosecretory hormones: Diapause, moulting and juvenile hormones.</p> <p>Pheromones and their applications</p> <p>Insects and their relationship with man:</p> <ul style="list-style-type: none"> - Physical and chemical disturbances - Environmental impact assessment - Insects as vectors of diseases 	
Zoo 613	Parasite culture	2 (2+0)
Contents	<p>This course aims to provide parasitology Ph.D. students with the theoretical principles of parasite culture (in culture media and in laboratory animals) that they might need for their Ph.D. research programmes. It includes:</p> <ul style="list-style-type: none"> - An introduction about animal tissue culture - The theoretical principles of culturing (in culture media) the following parasites: <i>Trypanosoma spp.</i> <i>Leishmania spp.</i> <i>Entamoeba spp.</i> Bladderworms, especially hydatid cysts - Free-living strongyle larvae and methods of identification of infective forms. - Maintenance of various parasites in laboratory animals. 	
Zoo 614	Selected Topics in Entomology or Parasitology	2 (2+0)
Contents	<p>Advanced selected topics in entomology or parasitology according to the need of the student and the guidance of the supervisor.</p>	
Zoo 622	Aquatic vertebrates	2 (2+0)
Contents	<p>Broad and detailed view of the recent advances in systematics, comparative anatomy, functional morphology, adaptations and zoogeography of aquatic vertebrates. Recent issues and current interest in the biology and the distribution of Arabian aquatic vertebrates .</p>	
Zoo 623	Nutrients requirement and Metabolism in Fish	2 (2+0)
Contents	<p>Advanced study of nutrients requirement and metabolism of fish in various physiological conditions. Factors affecting the nutrients requirement. Interaction of protein, fat and carbohydrate metabolism. Students' reports on recent journal articles.</p>	

Zoo 624	Bioeconomics of Fisheries Resources	2 (2+0)
Contents	Economic analysis used in the evaluation of fisheries resources, supply and demand statistical analysis and data generation , laws affecting production and catch, economics of fisheries projects.	
Zoo 635	Advanced Animal Behaviour	2 (2+0)
Contents	An Introduction to animal behaviour and types of behaviour. Foraging behaviour and different regimes. Behavioural physiological adaptations. Animal behaviour and applied Pharmacology. The role of animal behaviour in biomedical studies. Biological rhythm, homing and migration. Animal communication. Applications of Pavlov experiments. Biological control. The role of nervous system in behaviour.	
Zoo 638	Advanced Topics in Physiology	2 (2+0)
Contents	Reviewing the up-to-date knowledge and information available in the various disciplines of animal physiology including: neuro, endocrine, immuno, cardio-vascular, renal, gastrointestinal and reproductive physiology.	
Zoo 639	Current topics in Developmental Biology	2 (2+0)
Contents	Follow up of the recently published research in the area of developmental biology including: The molecular basis of developmental biology, gametogenesis and maturation of gametes, <i>in vitro</i> fertilization and embryo transfer, immune response during embryogenesis, recent techniques for tracing embryonic growth, factors involved in controlling embryonic cell proliferation.	
Zoo 642	Advanced Cytology-1	2 (2+0)
Contents	Cell membranes and their principal functions. Cell organelle's functions and the relationship between them. The cytoskeleton and its role in cell support and transport. Cell development and differentiation and factors affecting its growth. The nucleocytoplasmic interactions. Properties and types of cell cancer.	
Zoo 643	Functional Histology	2 (2+0)
Contents	Detailed studies on the correlation between the histology and the function of the digestive, urinary and reproductive systems and the sense organs.	
Zoo 651	Molecular Genetics	2 (2+0)
Contents	Control of gene expression and enzyme differentiation, hormonal control of gene expression, genetic polymorphism among enzyme loci, molecular population genetics and its techniques, DNA sequencing, genetic factors in developmental regulation and the molecular basis of the cytoplasmic inheritance.	
Zoo 672	Terrestrial Animal Ecology	2 (2+0)
Contents	Nature of communities, influence of competition and predation on community structure, terrestrial communities (desert, grass land, tropical community). Biodiversity in desert ecosystem, island ecology, topics on wildlife conservation, special topics on desert ecology (desertification).	

Zoo 673	◉Aquatic Animal Ecology	2 (2+0)
Contents	Advanced consideration of the aquatic ecology of aquatic animals species emphasizing current issues which include: community structure, population growth, population regulation, dispersion, species interaction, diversity, competition, predation, age composition, density and niche theory. Recent advances of the interrelationships between aquatic fauna and their environment. In depth studies, of recent advances, of statistical design and analysis of ecological measurement of selected aquatic populations.	
Zoo 674	◉Advanced studies In Pollution	2 (2+0)
Contents	Chemistry of ecological pollutants, physics of ecological pollutants, advanced studies in pollutants measurement. Advanced studies in geographical distribution of pollutants with relation to animal distribution. Advanced studies in effects of pollutants on animal physiology.	
Zoo 691	◉Seminar	2 (2+0)
Contents	Presentation and discussion of advanced topics in Zoology according to the guidance of the course instructor.	