Table 1

Sample of undergraduate courses in North America and the UK with a focus on Animal Learning and Cognition (2019)

A. Survey Courses/Modules

Country	Program	Course/Module	University	Description
Canada 	Psychology	Animal Behaviour	Algoma University	This is an introductory course in animal behaviour that combines biological and psychological approaches to behaviour through the use of evolutionary theory. The primary focus is on how the organism works, with discussion of data from behaviour genetics, development, and the physiology of behaviour.
		Animal Cognition	University of Toronto	The study of memory, representation, concept learning, and other cognitive processes in non-human animals using the methods of operant and Pavlovian conditioning.
		Animal Learning and Theory	McGill University	Contemporary and historical research and theory on animal learning approached from a behavioural, cognitive and biological perspective. Classical and instrumental conditioning, cognitive learning, and biological constraints. The status and history of North American behaviourism will be discussed and compared with cognitive and other approaches.

Comparative Cognition	Queen's University	An overview of the evolution and function of cognitive processes. Emphasis will be placed on understanding how natural selection shaped cognition across animal species. Topics such as memory, decision making, cooperation, and communication will be examined from a behavioural ecology and experimental psychology perspective.
Learning, Measuring, and Shaping Behaviour	McMaster University	This course will survey principles of learning theories along with measurement and assessment of behaviour through theoretical, experimental, and real-world applications in humans and animals
Principles of Learning	University of Alberta	Principles and processes of learning including a consideration of classical conditioning, instrumental learning, and memory. Research involving non-human animals will be emphasized.
	University of Guelph	This course provides a detailed description of principles and concepts of learning and motivation, as well as an introduction to their underlying neurobiological mechanisms. Over the course of the semester, we will discover the critical role of conditioning in normal and abnormal human behaviour. This will be achieved by an in-depth exploration of empirical evidence generated by key experiments performed in animal and human subjects.

		Theory and Learning in Comparative Cognition	University of Alberta	A theoretical analysis of topics such as Pavlovian conditioning, instrumental learning, working memory, timing, concept learning, and order and numerical competence. Also discussed will be the purposes and nature of theories and the historical development of theory in learning and comparative cognition.
United States of America (USA) 	Anthropology	Animal Minds	University of Arizona	With intricate cultures, language, impressive technology, and complex social lives, humans seem very different from other animals. Do other animals experience and think about the world similarly to humans? And what does it mean if they do? This course explores the nature of animal minds, similarities and differences with human cognition, and how and why cognition evolves. We will explore what animals understand about their physical and social worlds, whether animals have emotions, concepts, foresight and memory, or a sense of fairness. The course will cover historical perspectives on animal minds, as well as the latest research on these exciting topics. Through comparing and contrasting human and non-human cognition, we can learn about human psychological uniqueness, its evolutionary origins, and fundamental properties of cognitive processes in general.
	Psychology	Animal Behavior	University of Buffalo SUNY	In this course, we will take an integrative approach to the study of behavior in animals looking at topics such as learning, animal personalities, aggression, play, cooperation, communication, natural selection, and foraging.

	University of North Carolina Wilmington	Animal behavior including the traditional areas of ethology and comparative psychology. Primary emphasis is upon the similarities and differences in the behaviors of animals occupying various phylogenetic positions.
Animal Cognition	Kent State University	Focuses on the nature of cognition and intelligence in nonhuman animals. Topics include animal studies of perception and attention, associative learning, memory, spatial cognition, concept formation, reasoning and language in nonhuman animals.
	University of Buffalo SUNY	Focuses on animal minds, including perception, attention, representation, concept and rule learning, judgments of time and number, tool use, communication, self-awareness, and awareness of the other
	University of California Berkeley	This course focuses on how animals process, organize, and retain information. Specific topics include learning and memory, sensory processes, navigation and migration, communication, and cross-species comparisons of behavior. Material will be drawn from the ethological, behavioral/experimental, and, to a lesser extent, the neurosciences literature.

	University of California Los Angeles	Investigation of scientific study of cognition and behavior in animals. Topics include perception and attention, working and reference memory, spatial cognition, timing and counting, concept formation, and abstract reasoning. Most discussions focus on laboratory findings with animals, as viewed from evolutionary framework concerned with natural histories of animals.
Animal Learning and Cognition	Tufts University	This course is an introduction to the study of cognition in animals. Through lectures and classroom discussion, questions such as the following will be examined. How can and do animals think without language? Do rats use cognitive "maps" to get around their spatial environment? How do bees learn and remember where rich sources of food are located? How do animals communicate information to one another? What do birds and other animals see when they look out at the visual world? The course will survey the fundamental principles and theories of learning and information processing in animals. Topics to be examined will include conditioning and memory processes, orientation in space and time, visual perception, stimulus selection and control, memory, and self-awareness in animals.
	Villanova University	Cognitive mechanisms responsible for simple behavior and behavioral change as they have been studied using animal subjects.

Animal Minds	Carnegie Mellon University	With intricate cultures, impressive technology, and layered social lives, humans seem to stand apart from their animal kin. However, humans and non-human animals share many aspects of their mental lives, and, upon closer inspection, some animals even reveal cognitive abilities far beyond the capacities of humans. Through comparing and contrasting human and non-human cognition, we can learn about human psychological uniqueness and its evolutionary origins, and fundamental properties of cognitive processes in general
Animal Models in the Study of Cognition	University of Chicago	In the first half of the course we will read and discuss seminal literature in the study of cognitive questions using animal models (primarily rodents).
Basic Learning Processes	Kent State University	Examination of basic principles of Pavlovian conditioning, instrumental conditioning, animal learning and memory processes and animal cognition. Emphasis on major empirical phenomena derived from research with animals with reference to related psychological processes in humans.
Comparative Cognition	Bucknell University	Advanced seminar exploring cognition and behavior from evolutionary and comparative perspectives. Topics will include social behavior, memory, communication, spatial cognition, learning, and meta-cognition.

Comparative Psychology	Texas Christian University	Provides knowledge of animal behavior as a field of research based on mechanistic and evolutionary approaches. Provides a basic vocabulary and a conceptual framework which enables the student to appreciate the importance and scope of animal behavior as an interdisciplinary field and to identify areas of interest for further study.
	University of South Florida	The study of the evolution of behavior, similarities, and differences in capacities for environmental adjustment and for behavioral organization among important types of living beings.
Learning	University of Kentucky	The contemporary theoretical and empirical bases of conditioning and learning in humans and nonhumans.
Learning and Adaptive Behavior	Duke University	Principles of instrumental learning in animals and humans. Topics include elicitation, classical conditioning, reinforcement, punishment, problem solving, behavioral economics, and verbal behavior. Focus on empirical data, quantitative analysis, research methodology, and technologies generated from learning research.
Learning, Cognition, and Behavior	University of Vermont	Behavioral and cognitive principles underlying learning, memory, and action inside and outside the laboratory. Includes conditioning, motivation, biological constraints, and mechanism of remembering and forgetting.

Learning and Memory	University of Illinois Urbana-Champaign	Survey of basic phenomena in learning and memory emphasizing experimental data from animal and human research.
	Yale University	The basic facts, general principles, and theories that describe how higher animals, from mice to humans, are changed by their experiences. The historically separate fields of learning and memory research desegregated under a neuroscientific perspective that recognizes the evolutionary continuity among higher animals.
Principles of Learning	Georgia Southern University	Introduces the basic principles and the scientific study of learning in human and nonhuman animals.
Psychology of Learning	University of Buffalo SUNY	This course covers the ways in which humans and animals acquire new patterns of behavior, factors which control and/or limit those acquisition processes, and the theories which have been proposed to explain the mechanisms underlying learning.

United Kingdom (UK) 	Biology	Acquisition of Behaviour	University of Bristol	An important objective of this unit is to examine the scientific evidence for sophisticated mental processing in non-human animals. This unit focuses on proximate explanations for acquisition of behaviour in animal inheritance and learning. The unit begins by considering genetic influences on behaviour, and also interactions between genetic predisposition and individual experience in development of behaviour. The unit will then explore the fundamental processes used by animals in acquiring their behaviour, including conditioning, recognition learning, classification and discrimination, following lectures address cognitive processes, and cover social learning, cultural transmission, intelligence, tool use, spatial memory, communication and language.
		Animal Cognition	University of St. Andrews	In this module we will investigate the cognitive abilities of animals, with particular interest in understanding the adaptive value of those abilities. This means that although we will develop an understanding of animal cognition based on standard animal models (typically rats and pigeons), we will extend those principles to addressing cognitive abilities in 'real' animals behaving in the 'real' world.
	Psychology	Animal Behaviour	University of Stirling	Introduces students to the study of animal behaviour and animal cognition within an evolutionary framework, and shows how this perspective also provides insights into human evolution.
		Animal Cognition	University of York	N/A

Animal Learning and Cognition	Cardiff University	A look at learning (classical and operant conditioning), cognition (knowledge, social learning, Theory of Mind) and affect in animals
Evolutionary and Comparative Psychology	University of St. Andrews	This module will address evolutionary and comparative approaches to psychology. The aim is to provide an understanding of major evolutionary forces and how they have shaped animal and human behaviour and psychology. Key principles, concepts and methodologies will be introduced and related to specific topic areas such as the evolution of social behaviour and the evolutionary origins of language and cognition.

B. Specialized Courses/Modules (e.g., applied, laboratory-based, limited species)

Country	Program	Course/Module	University	Description
Canada 	Animal Science	Applied Animal Behaviour	University of Guelph	This course deals with why domesticated animals behave as they do with reference to causation, function, ontogeny and phylogeny. Basic principles are illustrated by examples taken from all the common domesticated and captive species. Emphasis is placed on the application of behavioural knowledge to improve captive environments and animal production systems. Designing housing, facilities and management procedures to suit the behaviour of the animals in question is also covered.

	Companion Animal Behaviour	Dalhousie University	In this course, students will study the fundamentals of animal learning and how those principles affect success in training and behaviour modification. Attention will be given to understanding and solving behaviour problems (e.g., separation anxiety, dominance aggression, fighting, inappropriate urination, and behavioural stereotypies). The focus is on companion animals – dogs and cats, and to some extent horses. The normal development of behaviour in those species will be covered.
Psychology	Comparative Cognition: Laboratory in Animal Learning	Queen's University	This course covers recent research in comparative cognition at an advanced level. Emphasis will be placed on critically evaluating scientific controversies in specific topics, such as episodic memory in animals, mechanisms of spatial navigation, and value-based decision-making. Laboratory sessions will explore the principles discussed in lectures.
	Comparative Cognition: Laboratory in Cognitive Origins	Queen's University	Advanced study in comparative cognition with a focus on the evolution and function of cognitive processes across animal species. Through lectures, laboratory activities, and readings, theory and research methodology in the areas of number, timing, casual reasoning, social learning, tool use, social cognition, and communication will be discussed.

		Conditioning and Learning Laboratory	University of Toronto	Provides hands on experience with some widely used preparations and procedures for studying learning and memory in animals. Reading and writing research in this area are emphasized. Experiments with rats and pigeons are conducted, initially under close supervision.
		Method and Theory in Learning and Motivation	Western University	A research oriented course with emphasis on the methodology. Operant conditioning with animals and motivation with animals and humans will be emphasized in lectures and laboratory work.
		Spatial Cognition	University of Alberta	This course will survey research on how people learn and remember spatial information, and navigate their environments. Topics may include neurology, individual differences, cultural and cross-species comparisons.
United States of America (USA) 	Animal Science	Companion Animal Behavior and Training	Texas Tech University	Covers basic principles of animal learning and provides an introduction to dog training and companion animal behavioral consulting.
	Cognitive Science	Animal Cognition	University of California San Diego	Examines the contrasts and parallels between primates and cetaceans in sensorimotor constraints, neuroanatomy, field behavior, and cognition in the lab, with a focus on the demands of competition and cooperation that helped shape the evolution of social cognition.

Mind, Brain, & Behavior (Interfaculty Initiative)	The Origins and Evolution of Cognition: A Comparative Study of Human and Nonhuman Abilities	Harvard University	Most scientists agree cognition is widespread in nature and involves an organism processing information to solve problems (like avoiding predators, finding prey, attracting a mate, achieving shelter), and in humans higher-level reasoning and conceptualizing. Less clear are the origins and evolutionary basis of cognition-what evolutionary pressures were exerted that selected for such processing? Explores possible ways to answer this question with research in anthropology, neurobiology, philosophy, psychology, genetics, sociality, and other disciplines.
Psychology	Animal Orientation: Function and Mechanisms	Hunter College	Finding mates, securing shelter and food, and returning to a familiar home are ubiquitous animal functions which often require complex navigational strategies. This course 1) explores historical attempts to develop an understanding of the role and determinants of these strategies, 2) reviews the complexity of orientation behavior across phyla mediated by simple taxes, landmark orientation, compass orientation, path integration and dead reckoning, and cognitive mapping, 3) discusses sensory control of orientation behavior, including multisensory integration, and sensory modality transposition, 4) reviews tools and models used by researchers of animal orientation, and 5) addresses physiological and molecular bases of selected behaviors.

Barking and Talking: What is Communication?	University of Iowa	Similarities and differences in human language and animal communication; contexts of communication, function of communication, cognitive bases of communication, and mechanisms of communication.
Canine Cognition	Barnard College	An examination of the scientific study of the domestic dog. Emphasis will be on the evolutionary history of the species; the dog's social cognitive skills; canid perceptual and sensory capacities; dog-primate comparative studies; and dog-human interaction.
Communication Behavior	Hunter College	This course will examine behaviors that exchange information, the evolution of the signals that carry the message, and the senses that receive it. Both human nonverbal and animal communication systems will be analyzed. Students will conduct field and library research on specific communicative behaviors.
Human Cognitive Evolution	Duke University	Survey of methods/theories used in the study of human cognitive evolution; development of cognition in children; brain damaged patients; cognitive abilities of great apes; paleoanthropology of early and modern humans and evidence for mental abilities and culture; cross-cultural and sex differences in human cognition; genetics and the evolution of cognition.
Laboratory in Animal Cognition	Tufts University	An advanced laboratory course familiarizing the student with the methods and strategies used to study cognition in animals.

Learning and Behavior	Georgia Southern University	A more in-depth exploration of classical and operant conditioning with the requirement of conducting experiments with non-human animals to illustrate concepts and principles.
Learning and Conditioning	Illinois Wesleyan University	An introduction to the principles of learning and conditioning in both humans and animals. Topics include Pavlovian (classical) conditioning, operant conditioning, and applied behavior analysis. Laboratory work includes conditioning of animal subjects.
Learning Laboratory	University of California Los Angeles	Laboratory experience with techniques in study of learning, especially with animals.
Primate Cognition	Bucknell University	An investigation into the cognitive abilities and capacities of nonhuman primates emphasizing a comparative perspective.
	The Ohio State University	Research about monkeys and apes with emphasis on their learning, arts, memory, curiosity, language, and neuropsychological problems.
Primate Behavior and Ecology	Bucknell University	Introduction to research on prosimians, monkeys, and apes with emphasis on the evolutionary origin of diversity, habitat use, social structure, social behavior, and cognitive abilities.
Primate Social Psychology	Emory University	Recent progress in the field of primate social behavior, particularly the role of cognition in complex social strategies.

United Kingdom (UK) 	Psychology	Evolution of the Human Mind	Queen Mary University London	This course will examine evidence for key stages in the evolution of the human mind, especially in comparison with the cognitive abilities of non-human animals, such as apes, corvids and cetaceans. Students need to assess evidence from a wide range of disciplines, including neuropsychology, brain evolution, archaeology, biological anthropology and comparative psychology to determine how human brains and minds evolved to use tools, create languages, religion, art and science and develop into the most creative, but also destructive species the world has ever known.
		Origins and Evolution of Mind Reading (Theory of Mind)	University of St. Andrews	The module will offer a comparative approach to the emergence of the ability to understand mental states in children and non-human primates, and its alteration in autism. This ability (also known as Theory of Mind) is at the heart of many of humans unique cognitive achievements, but their origins can be traced back in evolution and development. The course will discuss the current state of research in this area, emphasising both empirical and conceptual aspects posed by the combination of the evolutionary and developmental approaches.

	The Associative Mind	University of Exeter	Associative processes can be characterised as those that we share with other animals and that do not require what we conventionally refer to as conscious thought. Rule-based processes are more akin to the everyday notion of "thinking". An understanding of both will equip you with an understanding of how to explain and influence human and animal behavior.