FOUNDATIONS OF PSYCHOBIOLOGY I – Code 800140

Academic Year 2018-19

COURSE INFORMATION

Undergraduate Studies: 0812 – Degree in Psychology (Studies Plan 2009-10)
Type: Compulsory
ECTS: 6.0
Module: Basic training
Area: Biology
Year: First
Semester: 1

INSTRUCTOR INFORMATION

Name: Professor Fernando Colmenares and Dr Pilar Casado Martínez
Mail: colmenares@psi.ucm.es
Office number: School of Psychology, Building II, Office 2008-G
Office hours: Mondays and Wednesdays from 14:00 to 15:00 and Thursdays from 13:00 to 15:00

SYNOPSIS

COMPETENCIES

General competencies

GC4: Know and understand the biological foundations of human behaviour and psychological functions.

Transversal competencies

TC1: Analysis and synthesis.

TC2: Preparation and defence of properly reasoned arguments.

TC5: Looking for information and data interpretation on social, scientific and ethical topics related to the field of Psychology.

TC7: Critical thinking and self- analysis.

TC9: Communication skills, learning how to communicate ideas to both, professional and non-professional audiences.

Specific competencies

SC4: Be able to describe and measure variables (personality, intelligence and other aptitudes, attitudes, etc.) and cognitive, emotional, psychobiological and behavioural processes).

TEACHING ACTIVITIES

The course comprises lectures, seminars, practical sessions (including small-group activities in the class/computer room and field work), student presentations, and online activities. There will also be complementary face-to-face (individual and group) and internet tutorial teaching available.

ECTs break-down (1 ECTS= 25 hours)

TEACHING ACTIVITIES	Hours (150)	% of total credits	Attendance
Class sessions	46	31	100%
Tutorials	30	20	50%
Students' work (class assignments, field work, class presentations, and time of study)	68	46	100%
Assessment activities	6	8	100%

BRIEF DESCRIPTION:

The course is organized around five major module topics: concept and method of psychobiology, evolution, development and inheritance, comparative and evolutionary psychology, and principles of cell signalling and transmission in the nervous system.

PRE-REQUISITES

None, although basic training in biology and psychology will be helpful.

OBJECTIVES

At the end of the course, students are expected to know and understand a set of basic concepts and theories about the integrative biology of behaviour which enable them to appreciate the scope and importance of psychobiology. They are also expected to master the skills needed to apply their knowledge for developing critical thinking about and analysing human behaviour from both proximate and ultimate perspectives.

TOPICS

MODULE I. CONCEPT AND METHOD OF PSYCHOBIOLOGY

Unit 1. Concept of psychobiology.

Unit 2. Method and techniques of psychobiology.

MODULE II. EVOLUTION

Unit 3. Evolutionary thinking and evolutionary theories.

Unit 4. Evolutionary mechanisms, processes and outcomes.

Unit 5. Biodiversity, phylogeny and evolutionary transitions.

Unit 6. Patterns and processes in human evolution.

MODULE III. DEVELOPMENT AND INHERITANCE

Unit 7. Principles of development and inheritance.

Unit 8. Genes, organism, and environment.

Unit 9. Genetic and epigenetic inheritance, parental effects, and ecological and cultural inheritance.

MODULE IV. Behaviour and Psychological Processes in Evolutionary Context

Unit 10. Behaviour, psychological profile, health and survival.

Unit 11. Reproduction and sexual and parental behaviour.

Unit 12. Social behaviour, communication, and sociality.

Unit 13. Behaviour, emotion, and cognition.

MODULE V. FOUNDATIONS OF CELL SIGNALING AND COMMUNICATION IN THE NERVOUS SYSTEM

Unit 14. Cell biology of the nervous system.

Unit 15. Generation, transmission, and integration of neural signals.

Unit 16. Neurotransmitters and principles of drug action.

ASSESSMENT

Student's knowledge and level of achievement of required learning objectives and outcomes will be assessed via multiple-choice tests. There will be 2 tests per module (except module 5), one at the end of each module and the other when the course is done. There will be a pass mark per module and each module will make a different contribution to the overall module mark, based on each module's content material. The overall module mark will represent 70-80% of the final course mark. The remaining 20-30% contribution will be the cumulative mark for such student activities as practical sessions, presentations, field work, and online activities (forum contributions).

The final grading will be as follows:

0-4.9: fail (SS).
5.0-6.9: pass (AP).
7.0-8.9: very good (NT).
9.0-10: outstanding (SB).
10 with distinction (MH)

RESOURCES

Textbooks

Alcock, J. (2009, 9th ed.). *Animal Behavior*. Sinauer.
Boyd, R. & Silk, J. B. (2014, 6th ed.). *How Humans Evolved*. Norton, International Student Edition.
Breedlove, S. M. & Watson, N. V. (2013, 7th ed). *Biological Psychology. An Introduction to Behavioral, Cognitive and Clinical neuroscience*. Sinauer.
Colmenares, F. (2015). *Fundamentos de psicobiología, Vol. 1: Conceptos, principios, evolución, desarrollo y herencia.* Madrid: Sintesis.
Colmenares, F. (2015). *Fundamentos de psicobiología, Vol. 2: Comportamiento y procesos psicológicos en contexto evolutivo*. Madrid: Sintesis.
Futuyma, D.J. (2009, 2nd ed.). *Evolution*. Sinauer.
Gilbert, S. F. & Epel, D. (2015, 2nd). *Ecological Developmental Biology: Integrating epigenetics, medicine, and evolution*. Sunderland, MA: Sinauer.
Gluckman, P., Beedle, A. & Hanson, M. (2009). *Principles of evolutionary medicine*. Cambridge University Press.
Sadava, D., Hillis, D., Heller, H. C., & Berenbaum, M. (2014). *Life, the science of Biology* (Vols. 1 & 2). Sunderland, MA: Sinauer.
Shettleworth, S. J. (2010, 2nd ed.). *Cognition, Evolution and Behavior*. Oxford University Press.

Basic references

Audesirk, T. et al. (2011, 9th ed.). Biology, Life on Earth with Physiology. Pearson.
Bateson, P.P.G. y Martin, P. (2000). *Design for a life, how behavior develops*. Vintage, London.
Breed, M.D. y Moore, J. (2012). *Animal behavior*. Academic Press, London.
Brüne, M. (2008). *Textbook of evolutionary psychiatry: the origins of psychopathology*. Oxford University Press, Oxford.
Davies, N. B., Krebs, J. R. y West, S. A. (2012). *An introduction to behavioural ecology*. Wiley-Blackwell, Oxford.
Dugatkin, L.A. (2009). *Principles of animal behavior*. Norton, London.
Lewontin, R. (2000). *The triple helix. Gene, organism and environment.* Harvard University Press, Cambridge, Mass.]
Martin, P. y Bateson, P.P.G. (2007). *Measuring behaviour. An introductory guide.* Cambridge University Press, Cambridge.]
Mayr, E. (2002). *What evolution is*. Phoenix, London.
Mayr, E. (1997). *This is biology, the science of the living world.* Harvard University Press, Cambridge, Mass.]
Michel, G.P. y Moore, C. (2005) *Developmental psychobiology. An interdisciplinary science*. The MIT Press, Cambridge, Mass.
Nelson, R.J. (2011). *An introduction to behavioral endocrinology*. Sinauer, Sunderland, Mass.
Papini, M. R. (2011). *Comparative psychology: Evolution and development of behavior*: Psychology Press
Pinel, J.P.J. (2010, 8th ed.). Biopsychology. Allyn & Bacon.
Sapolsky, R.M. (2004).*Why zebras don't get ulcers? The acclaimed guide to stress.* Henry Hole, New York.
Sapolsky, R.M. (2017). Behave, the Biology of Humans at Our Best and Worst. Bodley Head, London.
Toates, F. (2011). *Biological psychology*. Pearson, NY.

Supplementary references

Bradbury, J.W. y Vehrencamp, S.L. (2011). *Principles of animal communication*. Chpt. 1. Sinauer, Sunderland, Mass.
Budiansky, S. (2001). *Si los animales hablaran…no los entenderíamos, la evolución de la conciencia y la inteligencia.* Ateles, Madrid. [Budiansky, S. (1998). *If a lion could talk, animal intelligence and the evolution of consciousness.* Free Press, New York].
Bonduriansky, R. & Day, T. (2018). Extended Heredity. A New Understanding of Inheritance and Evolution. Princeton University Press, Princeton, N.J.
Buller, D.J. (2005). *Adapting minds, evolutionary psychology and the persistent quest for human nature.* Harvard University Press, Cambridge, Mass.
Buss, D. (ed.) (2005). *The handbook of evolutionary psychology*. John Wiley, New York.
Carere, C. y Maestripieri, D. (Eds.). (2013). *Animal personalities: behavior, physiology, and evolution*. University of Chicago Press, Chicago.
Carroll, S.B. (2005). *Endless forms most beautiful, the new science of evo-devo.* Norton, New York.
Coyne, J.A. (2009). *Why evolution is true*. Penguin, New York.
Damasio, A. (2010). *Self comes to mind*. Pantheon, New York.
Dawkins, R. (1976/1999). *The selfish gene.* Granada, London.
Dawkins, R. (2006). *The god delusion*. Houghton, New York.
Dawkins, R. (2009). *The greatest show on Earth, the evidence for evolution*. Black Swan, London.]
de Waal, F.B.M. (2009). *The age of empathy, nature's lessons for a kínder society.* Harmony, New York].
Dunbar, R. y Barrett, L. (Eds.). (2007). *The Oxford handbook of evolutionary psychology*. Oxford University Press, Oxford.
Fink, G. (Ed.) (2010). *Stress science. Neuroendocrinology*. Academic Press, London.
Francis, R.C. (2011). *Epigenetics, the ultimate mystery of inheritance.* Norton, New York.
Gilbert, S. F. (1996). *Developmental Biology*. Sinauer, Sunderland, Mass.
Gómez, J.C. (2004). *Apes, monkeys, children, and the growth of mind.* Harvard University Press, Cambridge, Mass.
Gould, S. J. (1989). *Wonderful life.* Penguin, London.
Gould, S.J. (1996). *The mismeasure of man*. Penguin, New York.
Hallgrímsson, B. y Hall, B. K. (Eds.) (2011). *Epigenetics: linking genotype and phenotype in development and evolution*. University of California Press, Berkeley.

Harmon-Jones, E. y Winkielmen, P. (Eds.) (2007). *Social neuroscience, integrating biological and psychological explanations of social behavior*. Guilford Press, New York.
Hauser, M. (2006). *Moral minds, how nature designed our universal sense of right and wrong.* Harper, New York.]
Hauser, M. (2001). *Wild minds, what animals really think*. Penguin, London.
Jablonka, E. y Lamb, M.J. (2005). *Evolution in four dimensions*. The MIT Press of Harvard University, Cambridge, Mass.
Laland, K.N. (2017) Darwin's Unfinished Symphony, How Culture Made the Human Mind. Princeton University Press, Princeton
Lane, N. (2009). *Life ascending. The great inventions of evolution*. Norton, New York.
Maltby, J., Day, L. y Macaskill, A. (2013). *Personality, individual differences and intelligence*. Pearson Education, Harlow.
Mayr, E. (2007). *What makes biology unique? Considerations on the autonomy of a scientific discipline.* Harvard University Press, Cambridge, Mass.
Nesse, R.M. y Williams, G.C. (1994). *Why we get sick, the new science of Darwinian medicine.* Vintage, New York.
Noble, D. (2006). *The music of life. Biology beyond genes.* Oxford University Press, Oxford.
Odling-Smee, F.J., Laland, K.N. y Feldman, M.W. (2003). *Niche construction, the neglected process in evolution.* Princeton University Press, Princeton.
Oyama, S. (2000). *Evolution's eye, a systems view of the biology-culture divide.* Duke University Press, Duke.
Shapiro, J. A. (2011). *Evolution: a view from the 21st century*. FT Press Science, New Jersey.
Sherman, P.W. y Alcock, J. (Eds.) (2010). *Exploring animal behavior*. Sinauer, Sunderland, Mass.
Sherratt, T.N. y Wilkinson, D.M. (2009). *Big questions in ecology and evolution*. Oxford University Press, Oxford.
Shubin, N. (2009). *Your inner fish, a journey into the 3.5 billion-year history of the human body*. Random, New York.
Tomasello, M. (2009). *Why we cooperate*. The MIT Press, Boston.
West-Eberhard, M.J. (2003). *Developmental plasticity and evolution*. Oxford University Press, Oxford.

Other resources (recommended web sites)

http://www.flyfishingdevon.co.uk/salmon/index.htm
http://www.pbs.org/wgbh/evolution/educators/index.html
http://bio.research.ucsc.edu/~barrylab/classes/animal_behavior/BEHAVIOR.HTM
http://learn.genetics.utah.edu/
http://www.biopsychology.com/