

SEMESTER I
LSM3252 EVOLUTION AND COMPARATIVE GENOMICS

Prerequisite: LSM1103

Workload: 26 lecture hours + 6 tutorial hours + 18 practical hours

Presentation of the theory of Evolution as one of the unifying disciplines in biology. The module introduces the three main themes in modern Evolutionary Biology: (I) Tree-of-Life: including processes and mechanisms of speciation, (II) Natural selection: including sexual selection and kinship selection, (III) Neutral Evolution: including genetic drift. Comparative Genomics is incorporated in the module by discussing the origin of life, whole genome comparisons, gene duplication, and using molecular data for the reconstruction of the phylogenetic relationships between species. The module emphasizes the importance of evolutionary biology as a tool that can explain a wide variety of phenomena in biology.

S/N	Topics	Lecture hours
1.	Natural selection Population genetics Species and speciation Tree of life Genome evolution Human evolution	13 Huang Danwei
2.	Introduction Adaptation Sociality Altruism Sexual selection I Sexual selection II	13 Ng Ngan Kee
	Lectures:	26h
	Practicals:	6x3h
	Tutorials:	6h
	Total hours:	50h

RECOMMENDED TEXTBOOK:

Stearns, S.C. and R.F. Hoekstra. 2005. Evolution: An Introduction. (Second Edition). Oxford University Press, 596 pp.
Bergstrom, C.T. and L.A. Dugatkin. 2016. Evolution. W. W. Norton & Company, 700 pp.

REFERENCE BOOKS:

Andersson, M. 1994. Sexual Selection. Princeton University Press, Princeton.
Dawkins, R. 1989. The Selfish Gene. Reprinted from 1976 edition. Oxford: Oxford University Press.
Dawkins, R. 1986. The Blind Watchmaker. Oxford: Oxford University Press.
Dawkins, Richard. 1989. Extended Phenotype: The Long Reach of the Gene. Oxford University Press.
Futuyma, D. 1998. Evolutionary Biology, 3rd edition. Massachusetts: Sinauer Associates Inc.
Maynard Smith, J., and Szathmáry, E. 1999. The origins of life: From the birth of life to the origin of language. Oxford University Press, Oxford.
Page, D. M., and Holmes, E. C. 1998. Molecular Evolution. A Phylogenetic Approach. Blackwell, Science, London.

PRACTICALS and TUTORIALS: The laboratory sessions will comprise 2 field trips during which we will discover how evolution works based on living examples from animals and plants. There will be one practical session on human evolution and two practical sessions on evolutionary behavior analyzing the behavior of different animals from the evolutionary perspective. The last practical will be for the students to present their own research on a chosen topic – this will be in the form of an oral session. The tutorials are incorporated into the practicals and field trips, and allow the students to discuss evolution with the TAs and staff.

MODE OF ASSESSMENT: 40% CA; 60% Final Exam.

There will be a formal written final examination (essay and short questions) which will constitute 60% of the total. The other 40% will be from two laboratory reports, one oral presentation and report. The details are published on IVLE.

MODULE CO-ORDINATOR & LECTURER:

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