Topics in Evolutionary Dynamics.
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This course will focus on evolutionary dynamics from the viewpoint of adaptation. During the course, I will discuss the following topics:

1. Basics of natural selection,
2. The concept of fitness,
3. Evolution in structured populations;
4. Phenotypic models (quantitative genetics, game theory, adaptive dynamics);
5. Kin selection and group selection,
6. Computing fitness in metapopulations,
7. Case study: The evolution of dispersal;
8. Evolutionary models for multiple traits,
9. Clarifying genetic correlation, correlated selection, trade-offs, and syndromes,
10. Case study: the evolution of distribution margins with genetic correlations.

Suggested Readings

Classics:

Grafen A. (1984). *Natural selection, kin selection and group selection. In: Behavioural Ecology: an Evolutionary Approach* (eds. Krebs JR & Davies NB). Blackwell Oxford, pp. 62-84.
http://users.ox.ac.uk/~grafen/cv/KandD2ed.pdf

Hofbauer J. & Sigmund K. (1990). *Adaptive dynamics and evolutionary stability*. Appl Math Lett, 3, 75-79.
http://homepage.univie.ac.at/karl.sigmund/adaptivedynamics.pdf

Lenormand T. (2002). *Gene flow and the limits to natural selection*. Trends Ecol Evol, 17, 183-189.
http://www.ugr.es/~jmgreyes/gene%20flow%20limit%20nat%20selection.pdf

http://www.cell.com/trends/ecology-evolution/abstract/S0169-5347(02)02497-7

Reeve H.K. & Sherman P.W. (1993). *Adaptation and the goals of evolutionary research*. Q Rev Biol, 1-32.
http://www.ugr.es/~jmgreyes/Reeve.pdf

Case Studies

Duputié A., Massol F., Chuine I., Kirkpatrick M. & Ronce O. (2012). *How do genetic correlations affect species range shifts in a changing environment*? Ecol Lett, 15, 251-259.

http://www.cefe.cnrs.fr/images/stories/DPTEFonctionnelle/BIOFLUX/Chercheurs/isabelle_chuine/publications/Duputie_etal_EcolLet%202012.pdf

Massol F., Duputié A., David P. & Jarne P. (2011*). Asymmetric patch size distribution leads to disruptive selection on dispersal*. Evolution, 65, 490-500. http://onlinelibrary.wiley.com/doi/10.1111/j.1558-5646.2010.01143.x/abstract