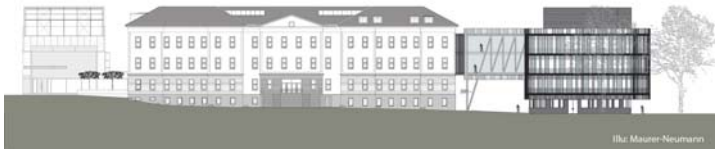

IST AUSTRIA
Institute of Science and Technology

Invitation to Courses

Problems in Evolutionary Genetics
(Half Module Biology)

Instructor: Nick Barton
Teaching Assistant: Harold de Vladar

Course Description: Population and quantitative genetics help us to understand and predict how populations evolve. This course will be based on a set of quantitative exercises - both pencil and paper, and simulation. The aim is to understand how we can model the evolution of populations, and how we use such models to make inferences from variation in DNA sequence and in quantitative traits.

1) Describing populations
2) Quantitative genetics
3) Neutral theory of molecular evolution
4) Selection
5) Interactions between evolutionary forces
6) Speciation

Prerequisites: Students should be familiar with elementary probability, and basic genetics: these will have been introduced in the "Probability and discrete mathematics" course. The course is designed to follow on from the Evolutionary Genetics Workshop in September; those who did not attend that should read Chs. 13-17 of Barton et al., or the corresponding sections of a similar textbook.

Students should bring a laptop with Mathematica installed: this is available via an IST site licence.

Literature: The course will roughly follow Chs. 13 - 19 + 22 in Barton et al.; Charlesworth & Charlesworth give a more detailed quantitative treatment. The quantitative aspects are covered by Otto and Day, which will be helpful for students coming from biology. Multiple copies will be available in the library, but you should consider buying one or other text, depending on your background.

Barton et al. *Evolution* Cold Spring Harbor Press, 2007
Charlesworth & Charlesworth, *Elements of Evolutionary Genetics*, Roberts and Co., 2010
Otto & Day *A Biologist's Guide to Mathematical Modelling in Ecology and Evolution*. Princeton University Press, New Jersey, 2007.

Coursework: Grades will be based on classroom participation, solutions to class questions, and performance in a final exam.

Course schedule: 2 weekly 75 min lectures Tuesdays and Thursdays, 50 mins recitations

Course Academic Credits: 3 ECTS

Course Website: **http://pub.ist.ac.at/courses/2011/problemsinevolutionarygenetics/**

Courses start on Tuesday, November 29, 2011 (10:15 – 11:30 am)
Seminar Room Mondi 3, IST Austria Central Building, 1st floor

2011-11-29

Please register for the course a week in advance with Academic Affairs (Marie.Trappl@ist.ac.at)

This invitation is valid as a ticket for the IST Shuttle from and to Heiligenstadt Station. Please find a schedule of the IST Shuttle on our webpage (note that the IST Shuttle times are highlighted in dark green):
http://www.ist.ac.at/fileadmin/user_upload/pdfs/IST_shuttle_2011.pdf.
The IST Shuttle bus is marked IST Shuttle (nr. 242) and has the Institute Logo printed on the side.