

## CAPSULE INTRODUCTIONS

BLOCK 1: Babai and May. Those in the apprentice program will attend the first three weeks of this course, and are cordially invited to attend the last four weeks. The first three weeks will be linear algebra, taught by Babai, the last four weeks will be matrix groups taught by May. More advanced students are welcome. The material of the second half is not part of the standard undergraduate curriculum.

BLOCK 2: Babai. Everyone is welcome. Those in the apprentice program are strongly urged to give it a try and to pick up background on the way. Graduate students will help.

BLOCK 3: Abert and Borger.

I. (Abert). Groups and number theory. This segment is **REQUIRED** for those teaching in YSP. It will be fully accessible to those in the apprentice program.

II. (Abert). Groups and words. The topics here relate groups to geometry and should be accessible to everyone. Relevant preliminaries will be given by Babai in the linear algebra course.

III. (Borger). Quadratic numbers. An accessible introduction to algebraic number theory via basic examples.

BLOCK 4: Fefferman and Cattaneo.

I. (Fefferman). An accessible introduction to Fourier analysis. This is material that every mathematician should know.

II. (Cattaneo). An introduction by example to applied Fourier analysis. Mathematics in action. Don't miss it.

BLOCK 5 Gordon and Constantin.

I. (Gordon). An introduction to the mathematics of superconductivity. This is anything remarkable example of mathematics in action.

II. (Constantin). A real introduction to some of the basic equations and concepts central to applied mathematics.

BLOCK 6 Farb and Hruska.

I. Farb. Gödel's famous theorems from scratch. Find out what they really say and how they are proven.

II. Hruska. Undecidable problems in mathematics, Turing machines, and the halting problem.

BLOCK 7 Lewicka. Optimal control theory. Motivation, examples, theory, and problems.

BLOCK 8 Muchnik. An introduction to topological dynamics.

For more information (except on Block 1) see the Abstracts posted at <http://www.math.uchicago.edu/~may/VIGREREU2004.html>

The schedule for the first two weeks are also posted there.

Later schedules, announcements, and information will also be posted.