



Isfahan University of Technology
Department of Mathematical Sciences

Winter 2014

Course Title: Permutation groups (1914546)

Credit: 4

Course Level: Graduate

Lecture Time: 15-17 Sunday and Tuesday

Lecturer: Bijan Taeri <http://taeri.iut.ac.ir>

Office Hours: 9:45--11:45 Sunday and Tuesday and with appointment.

Outline of the Course:

1. **The Basic Ideas, Symmetry**, symmetric groups, group actions, orbits and stabilizers, blocks and primitivity, Permutation representations and normal subgroups, orbits and fixed points
2. **Examples and Constructions**, actions on k-tuples and subsets, automorphism groups of algebraic structures, graphs, relations, semidirect products, wreath products and imprimitive groups, primitive wreath products, affine and projective groups, the transitive groups of degree at most 7,
3. **The Action of a Permutation Group**, orbits of the stabilizer, minimal degree and bases, Frobenius groups, permutation groups which contain a regular subgroup, computing in permutation groups,
4. **The Structure of a Primitive Group**, centralizers and normalizers in the symmetric group, the socle, subnormal subgroups and primitive groups, constructions of primitive groups with nonregular socles, finite primitive groups with nonregular socles, primitive groups with regular socles

Textbooks and References

1. Dixon, J. D., Mortimer, B., *Permutation groups*, Springer-Verlag, New York **1996**.
2. Wielandt, H. *Finite Permutation Groups*, Academic Press, New York & London, **1964**.
1. Cameron, P. J. *Oligomorphic Permutation Groups*, Cambridge University Press, **1990**.
2. Biggs, N. L., White, A. T. *Permutation Groups and Combinatorial Structures*, Cambridge University Press, **1979**.

Mark distribution:

Midterm	30% (13/Ordibehesht/1393)=(0 3/May/2014)
Home works and projects	10%
Final Exam	60%