MATH 731
Representations of Finite Groups
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Prerequisite: Math 632 or Math 631 plus extra reading.

Tentative outline of topics:

I. Permutation Representations
   - Characters
   - Structure of the Burnside ring
   - Idempotent formulas
   - Induction theorems

II. Linear representations in characteristic zero
   - Complete reducibility
   - Characters
   - Structure of the representation ring
   - Induction theorems
   - Rationality questions

III. Linear representations in characteristic p
   - Krull-Schmidt
   - Projective envelopes
   - Sources and vertices
   - Brauer characters
   - Relations with characteristic 0
   - The Green ring
   - Induction theorems

Suggested references:

Alperin and Bell, *Groups and representations*, Grad. Texts in Math. 162, Springer-Verlag, 1995.

Burrow, *Representation theory of finite groups*, Academic Press, 1965.

Curtis and Reiner, *Methods of representation theory*, Wiley-Interscience; several editions available.

Serre, *Linear representations of finite groups*, Grad. Texts in Math. 42, Springer-Verlag, 1977.

Relevant parts of Math 632 can be found in

Farb and Dennis, *Noncommutative algebra*, Grad. Texts in Math. 144, Springer-Verlag, 1993.