



PURE MATHEMATICS 511 "RINGS AND MODULES"

Calendar Description: H(3-0)

Ring theory, and structure of modules. Application to Abelian groups and linear algebra. Additional topics.

Prerequisite: One of Pure Mathematics 431, Mathematics 411; or consent of the Division.

Note: Credit for both Pure Mathematics 511 and 611 will not be allowed.

Possible Texts:

J.B. Fraleigh, T.W. Hungerford, or W.K. Nicholson (from PMAT 431, for UFD's and some other topics).

B. Hartley and T.O. Hawkes, *Rings, Modules and Linear Algebra*, Chapman and Hall, 1970.

Syllabus

<u>Topics</u>	<u>Number of Hours</u>
Unique factorization domains, principal ideal domains	6
Modules over a general ring, direct sums, factor modules, isomorphism theorem	6
Structure of modules over a PID	8
Applications to finitely generated abelian groups	1
Applications to matrices, rational and Jordan canonical forms	5
Suggested Optional Topics:	10
- Projective and injective modules, structure of rings, Wedderburn theorems	
- Localization in commutative rings	
- Introduction to representations of finite groups	
- More linear algebra	
TOTAL HOURS	36

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