

ORAL EXAMINATION

**Major area: DEFORMATION THEORY OF ALGEBRAS**

1. Algebras over commutative rings
  - enveloping algebras
  - separable algebras
  - algebras over fields
  - Azumaya (central separable) algebras
  - bialgebras and Hopf algebras
  - G-algebras
  
2. Algebraic groups
  - relationship to Hopf algebras
  - realization as matrix groups
  - associated Lie algebras
  
3. Cohomology
  - Hochschild cohomology
  - coalgebra and bialgebra cohomology
  
4. Deformations of algebras
  - definition, examples
  - trivial deformations
  - relation to cohomology
  - quantum groups

**References:** Gerstenhaber & Schack: Algebraic Cohomology and  
Deformation Theory (Sections 0-15, except 7-9, 11-13)

Waterhouse, Introduction to Affine Group Schemes  
Chapters 1,3,4, and 6 (sections 2,3,5 only)

DeMeyer & Ingraham, Separable Algebras over Commutative Rings  
(LNM 181) Chapter II (sections 1-3 and 7, only), Chapter V (section 1 results)

Giaquinto, Deformation Methods in Quantum Groups  
Chapters 2-5.