

## MATH 695 ADVANCED TOPICS ON MODULES OVER PRÜFER RINGS

### 1. BOOK

L. Fuchs and L. Salce. *Modules over Non-Noetherian Domains*. Mathematical Surveys and Monographs 84, American Mathematical Society, Providence, 2001.

### 2. RESEARCH PAPERS

1. B. Stenström, Coherent rings and FP-injective modules, *J. London Math. Soc.* 2 (1970) 323-329.
2. E. Matlis, Commutative semicoherent and semiregular rings, *J. Algebra* 95 (1985) 343-372.
3. F. Couchot, Injective modules and fp-injective modules over valuations rings, *J. Algebra* 267 (2003) 359-376.
4. F. Couchot, Almost clean rings and arithmetical rings, *Commutative Algebra and its Applications*, pp. 135-154, 2009.

### 3. SYLLABUS

WEEK	MATERIAL
<b>From Book</b>	
1	Finitely generated modules over valuation domains.
2	Projective dimension over valuation domains.
3	Global projective dimension of Prüfer domains.
4	Divisible modules over valuation domains.
5	Injectivity. Indecomposable injective modules. Absolute purity.
6	Injective modules over valuation and Prüfer domains.
7	Torsion-free modules over valuation domains.
8	D-Domains. Indecomposable modules.
9	Indecomposability over valuation domains.
<b>From Papers</b>	
10	Coherent rings and FP-injective modules (main result = Lemma 4.1)
11	Commutative semicoherent and semiregular rings (main result = Proposition 3.3)
12	Injective modules and fp-injective modules over valuations rings (1)
13	Injective modules and fp-injective modules over valuations rings (2)
14	Injective modules and fp-injective modules over valuations rings (3)
15	Almost clean rings and arithmetical rings (main results = Corollaries 5.2, 5.3, and 5.4)

### 4. OPEN QUESTIONS

1. Injective modules and fp-injective modules over local Gaussian rings.
2. Finitistic Weak Dimension of Gaussian rings.

### 5. GRADING POLICY

Take-home Exam	100
Work on open questions	100