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
From Book	
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.
From Papers	
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

120-minute presentations (15)	100
Take-home Exam	100
Seminar	50
Work on open questions	50