Pure Mathematics 511/ 611   Algebra III/Algebra IV

(see Course Descriptions under the year applicable: http://www.ucalgary.ca/pubs/calendar/)

Syllabus

Topics	Number of hours
Recap of rings and ideals; isomorphism theorem	3
Integral domains; maximal and prime ideals; principal ideal domains (PIDs)	3
The ascending chain condition; unique factorization in PIDs	3
Modules over rings; submodules; quotient modules; linear transformations and kernels	3
Direct sums of modules; free modules; basis and rank; the matrix of a linear transformation	3
Tensor product; extension of scalars	3
Symmetric and alternating products; determinants	3
Cyclic and torsion modules over PIDs	3
The structure of finite abelian groups; canonical forms of matrices	3
Finitely generated modules over PIDs; invariant factors	3
Presentations of modules; computing invariant factors	3
Exact sequences; hom and tensor functors and their adjointness, left and right exactness	3
Projective, injective and flat modules (time permitting)	
TOTAL HOURS	**36**

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WEC
Combined in 2011/12