



Pure Mathematics 415 Foundations

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

Syllabus

| <u>Topics</u> | <u>Number of Hours</u> |
|---|------------------------|
| Introduction: Review of informal set theory, Russell's Paradox, the need for axioms, formal language, history. | 2 |
| Ordered pairs, relations and functions, equivalence relations, ordering relations, partial order and well orderings, trees. | 3 |
| Axiomatic foundation of Set Theory. Power and limitations of the axiomatic method. | 5 |
| Axiom of choice and equivalents, paradoxes. | 5 |
| Cardinal and ordinal numbers, arithmetic, induction and recursion on ω and wellfounded sets. | 9 |
| Infinitary combinatorics, stationary sets and clubs, filters and ideals. Further axioms and applications. | 9 |
| TOTAL AMOUNT | 33 |
