UNIVERSITY OF CALGARY

FACULTY OF SCIENCE
Department of Mathematics and Statistics

PURE MATHEMATICS 415
"SET THEORY"

Calendar Description: H(3-1T)
Axioms for set theory, the axiom of choice and equivalents, cardinal and ordinal arithmetics, induction and recursion on well-founded sets, infinitary combinatorics, applications.

Prerequisite: One of: Mathematics 271, 311, 353 or Pure Mathematics 315 or consent of the Division.

Suggested Text:
W. Just and M. Weese, “Discovering Modern Set Theory I”, AMS
Thomas Jech, “Set Theory”, Academic Press
Enderton, "Elements of Set Theory", Academic Press, 1977 edition.
K. Kunen, “Set Theory: An Introduction to Independence Proofs”, North-Holland

Syllabus

Topics	**Number of Hours**
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**

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04:07:01 CALENDER DESCRIPTION CHANGE
CL:jml