Tennessee Technological University
Mathematics Department

MATH 4350/5350: Introductory Combinatorics

I. COURSE DESCRIPTION FROM CATALOG:

Topics to be covered include permutations, combinations, multisets, partitions, recurrence relations, generating functions, and the principle of inclusion-exclusion. Lec. 3. Cr. 3.

II. PREREQUISITE(S):

C or better in MATH 3400 or consent of instructor.

III. COURSE OBJECTIVE(S):

Students understand some of the concepts of enumeration and improve their ability to read and create mathematical proofs.

IV. STUDENT LEARNING OUTCOMES:

Upon successful completion of the course students will use combinations and permutations of sets and multisets, the inclusion-exclusion principle, generating functions, and recurrence relations to solve enumeration problems; develop a facility at combinatorial reasoning and strengthen proof-writing skills; and create combinatorial proofs of basic combinatorial identities.

V. TOPICS TO BE COVERED:

Enumeration-Sum Principle, Product Principle, Permutations, Combinations, Binomial and Multinomial theorems
Algebraic Counting Techniques-Principle of Inclusion-Exclusion, Generating Functions, Exponential Generating Functions, Recurrence Relations
Miscellaneous-Stirling Numbers, Partitions of Integers, Ferrer's diagrams, Combinatorial Proofs, and Rook Polynomials

VI. ADDITIONAL INFORMATION:

Students taking the course for graduate credit are expected to complete a project such as reading a paper involving combinatorics and presenting it to the class.

Graduate credit is earned on the basis of additional work required by the instructor per TTU Graduate Catalog.

VII. POSSIBLE TEXTS AND REFERENCES:

Introductory Combinatorics, 3rd edition, Kenneth P. Bogart.

VIII. ANY TECHNOLOGY THAT MAY BE USED:

IX. STUDENT ACADEMIC MISCONDUCT POLICY:

Maintaining high standards of academic integrity in every class at Tennessee Tech is critical to the reputation of Tennessee Tech, its students, alumni, and the employers of Tennessee Tech graduates. The Student Academic Misconduct Policy describes the

definitions of academic misconduct and policies and procedures for addressing Academic

Student Academic Misconduct at Policy Central.

X. DISABILITY ACCOMMODATION:

Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). An Accommodation Request (AR) should be completed as soo16