

Tennessee Technological University
Mathematics Department

MATH 4360/5360: Graph Theory

I. COURSE DESCRIPTION FROM CATALOG:

Fundamental concepts of undirected and directed graphs, trees, connectivity, traversability, colorability, network flows, and matching theory. Lec. 3. Cr. 3.

II. PREREQUISITE(S):

C or better in MATH 3400 or consent of instructor.

III. COURSE OBJECTIVE(S):

Students understand the fundamental concepts of graph theory and improve their ability to read and create mathematical proofs.

IV. STUDENT LEARNING OUTCOMES:

Upon successful completion of the course students will understand fundamental notions in graph theory, including isomorphism, tree, Eulerian circuit, Hamilton cycle, planarity, vertex coloring, vertex and edge connectivity, matching, and network flow; develop the ability to write precise and accurate mathematical definitions of objects in graph theory; demonstrate an understanding of fundamental results and algorithms in graph theory, including the Greedy algorithm, Kruskal's algorithm, the Four Color Theorem, Hall's Marriage Theorem, and the Max Flow-Min Cut Theorem; and create proofs in graph theory including direct arguments, indirect arguments, and induction.

V. TOPICS TO BE COVERED:

Fundamental concepts of undirected and directed graphs, trees, connectivity, traversability, planarity, (vertex) colorability, network flows, and matching theory.

VI. ADDITIONAL INFORMATION:

This course is often used by Secondary Education mathematics majors to satisfy the requirement that they take a course in discrete mathematics.

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

VII. POSSIBLE TEXTS AND REFERENCES:

Introduction to Graph Theory, 2nd edition, Douglas B. West
Graphs and Digraphs, 3rd edition, G. Chartrand and L. Lesniak

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

Misconduct at Tennessee Tech. For details, view the Tennessee Tech's Policy 217 – 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 soon as possible, preferably by the end of the first week of the course. The ODS is located in the Roaden University Center, Room 112; phone 372-6119. For details, view the Tennessee Tech's Policy 340 – Services for Students with Disabilities at [Policy Central](#).