UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE:	July 1994
COURSE REVISED IMPLEMENTATION DATE:	September 2005
COURSE TO BE REVIEWED: (Four years after implementation date)	September 2009 (MONTH YEAR format)

OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.

Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: **Science, Health & Human Services / Mathematics & Statistics**

MATH 445		**3**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

Introduction to Graph Theory
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course is an introduction to graph theory and its applications.

PREREQUISITES: **MATH 225 (Effective September 2005: MATH 211, MATH 221 and at least two upper-level MATH courses.)**

COREQUISITES:

SYNONYMOUS COURSE(S)
(a) Replaces: _____ *(Course #)*
(b) Cannot take: _____ *(Course #)* for further credit.

SERVICE COURSE TO:
_____ *(Department/Program)*
_____ *(Department/Program)*

TOTAL HOURS PER TERM: **60**

STRUCTURE OF HOURS:

Lectures:	**60**	Hrs
Seminar:		Hrs
Laboratory:		Hrs
Field Experience:		Hrs
Student Directed Learning:		Hrs
Other (Specify):		Hrs

TRAINING DAY-BASED INSTRUCTION
LENGTH OF COURSE: _____
HOURS PER DAY: _____

MAXIMUM ENROLLMENT: **36**
EXPECTED FREQUENCY OF COURSE OFFERINGS: **Every second year**

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☒ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

AUTHORIZATION SIGNATURES:

Course Designer(s): Math department
Chairperson: Peter Mulhern *(Curriculum Committee)*
Department Head: Gillian Mimmack
Dean: Jackie Snodgrass
PAC Approval in Principle Date:
PAC Final Approval Date: February 25, 2004

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

This course introduces the students to some basic graph theory concepts, important theories and their applications.

On completion of the course, the successful student will:

1. Be proficient with basic concepts in graph theory;
2. Be able to model practical problems as graph theory problems;
3. Be familiar with applications of graph coloring, planar graphs, digraphs, and Eulerian and Hamiltonian graphs.

METHODS:

This course will be primarily lecture-based. Evaluation will include quizzes, tests, assignments, and a final exam.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

Credit can be awarded for this course through PLAR (Please check :) ☒ Yes ☐ No

METHODS OF OBTAINING PLAR:

Course challenge

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

The textbook is chosen by a departmental curriculum committee. Recent text used:
Buckley, F and Lewinter, M. *A Friendly Introduction to Graph Theory*. Prentice Hall.

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

[An example of student evaluation for the course might be:]

The weighting of the components of the course may vary from instructor to instructor, although there must be at least two tests and a comprehensive final exam which must be worth at least 40% of the final grade. A student must obtain at least 40% on the final exam in order to pass the course.

An example of student evaluation for the course:

Assignments	15%
Midterm Exams (2)	40%
Final Exam	45%

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

1. Graphs and sub-graphs: Isomorphism, sub-graphs, adjacency matrix, paths, cycles and vertex degrees.
2. Trees: Cut-vertices, cut-edges and Cayley's formula.
3. Connectivity: Blocks and application of connectivity.
4. Eulerian graphs: Euler tours, Hamiltonian cycles and applications.
5. Matchings: Matchings, coverings and the assignment problem.
6. Edge and vertex colorings: Chromatic number, Vizing's Theorem, Brooks' Theorem and chromatic polynomials.
7. Independence: Independent sets, cliques, Ramsey's Theorem and applications.
8. Planar graphs: Plan and Planar graphs, dual graphs, Euler's formula and Kuratowski's Theorem.