UNIVERSITY COLLEGE of the FRASER VALLEY

PAC FORM #2

COURSE IMPLEMENTATION DATE: { **}**
COURSE REVISED IMPLEMENTATION DATE: { Sep-03 **}**
COURSE TO BE REVIEWED: { Sep-07 **}**
(FOUR (4) YEARS AFTER IMPLEMENTATION DATE) **MONTH / YEAR**

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 material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: **Mathematics and Statistics**

Math 225	**Math 243**	**3**
COURSE NAME/NUMBER	**FORMER COURSE NUMBER**	**UCFV CREDITS**

Topics in Discrete Mathematics
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:
This course introduces the student to some of the most useful type of combinatorial structures: graphs, trees, generating functions, and recurrence relations, all of which play an important role in the mathematics of computers and computation.

PREREQUISITES: Math 125

COREQUISITES:

SYNONYMOUS COURSE(S)

(a) Replaces: Math 243 (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.

Combination of Lecture and Lab Hours: NO **YES/NO**

TRAINING DAY-BASED INSTRUCTION

LENGTH OF COURSE: N/A

HOURS PER DAY: N/A

MAXIMUM ENROLMENT: **36**

EXPECTED FREQUENCY OF COURSE OFFERING: every second year

WILL TRANSFER CREDIT BE REQUESTED?: (Lower-level courses only) **YES** X **NO**

WILL TRANSFER CREDIT BE REQUESTED?: (Upper-level requested by department) **YES** **NO**

TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE: **YES** X **NO**

AUTHORIZATION SIGNATURES:

Course designer(s): Joseph Yu

Course reviewed by: (type name in this field)

Department Head: Greg Schlitt

Chairperson: Greg Schlitt

(Curriculum Committee)

Dean: Jackie Snodgrass

PAC Approval in Principle Date: (type date in this field)

PAC Final Approval Date: 2002 12 04

Math 225

COURSE NAME / NUMBER

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

This course introduces the students to some basic counting techniques, recurrence relations, generating functions, several of the important combinatorial objects such as graphs, trees, matchings, and graph algorithms.

On completion of the course, the successful student will:

(a) become proficient with basic concepts, including definitions and major theorems

(b) be able to use the Principle of Inclusion and Exclusion for enumeration problems that arise in many different situations

(c) to be able to construct generation functions and apply them on counting problems

(d) to be able to apply some standard graph algorithms (Dijkstras shortest parth algorithm, maximum matching, minimum weighted spanning tree and etc) to solve some practical problems

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 **YES X** **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 text is chosen by a departmental curriculum committee

Discrete and Combinatiorial Mathematics by R.P. Grimaldi, Addison-Wesley (1999)

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

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

The weighting of the components of the course may vary from instructor to instructor, although there must be at least two midterm exams 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 to pass the course.

An example of student evaluation for the course:

Quizzes and Assignments	20%
Midterm Exams (2)	40%
Final Exam	40%

Math 225
COURSE NAME / NUMBER

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

1. Principle of inclusion and exclusion:
   (a) Generalizaiton of the Principle
   (b) Derangements

2. Generating functions:
   (a) Definition and examples
   (b) Partitions of integers

3. Recurrence Relations:
   (a) The first-order linear recurrence relation
   (b) The second-order linear homogeneous recurrence relation
   (c) The nonhomogeneous recurrence relation
   (d) The method of generating functions

4. Graph theory and applications
   (a) An introduction to graphy theory
   (b) Basic structures: paths and cycles
   (c) Graph coloring and chromatic polynomials
   (d) Trees
   (e) Algorithms: shortest path, minimal spanning trees and maximal matchings