UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE:[September 1994
COURSE REVISED IMPLEMENTATION DATE:[January 2002
COURSE TO BE REVIEWED:[January 2006]
(Four years after implementation date)

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: PHYSICS

PHYS 381		3
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

MATHEMATICAL PHYSICS

COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course will give students a wide arsenal of mathematical techniques and tools to increase their ability in setting up and solving problems. The solution of partial differential equations with applications to many areas of physics is the biggest single theme of the course. Also included will be special functions, calculus of variations and integral equations.

NOTE: Students may obtain credit for either MATH 381 or PHYS 381, but not both. This course is cross-listed as MATH 381.

PREREQUISITES: MATH 211, one of PHYS 221 or MATH 255, and one of PHYS 112 or any second year Math course

COREQUISITES:

SYNONYMOUS COURSE(S)

(a) Replaces: N/A
(Course #)

(b) Cannot take MATH 381 for further credit
(Course #)

SERVICE COURSE TO:

(Department / Program)

(Department / Program)

TOTAL HOURS PER TERM: 43

STRUCTURE OF HOURS:

Lectures:	43	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 ENROLMENT: 36

EXPECTED FREQUENCY OF COURSE OFFERING: Once per 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): Peter Mulhern

Chairperson: *(Curriculum Committee)*

Department Head: Peter Mulhern

Dean: J. Snodgrass

PAC Approval in Principle Date:

PAC Final Approval Date: December 14, 2001

LEARNING OBJECTIVES / GOALS / OUTCOMES/ LEARNING OUTCOMES:

To give the student the ability to model a system, physical or otherwise, as a series of mathematical equations.
To give the student the ability to solve these equations.

METHODS:

Lecture, demonstration, small group practice, discussion, audiovisual presentation, use of models and charts.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

Credit can be awarded for this course through PLAR YES ___X___ NO

METHODS OF OBTAINING PLAR:

Initial oral discussion
Successful completion of a final exam

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

C. Ray Wylie and Louis C. Barrett, *Advanced Engineering Mathematics*
Murray R. Spiegel, *Advanced Mathematics for Scientists and Engineers*

SUPPLIES / MATERIALS:

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

Assignments	25%
Midterm	30%
Final exam	45%

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

1. A week of review including the interchanging of limits (differentiating under the integral sign, integrating series term by term etc.). Introduction to the big D operator techniques for solving differential equations.

2. Fourier Series.

3. Fourier Integrals.

4. Special Functions I (Gamma, Beta, Ei, Si, Erf).

5. Special Functions II (Bessel functions, Legendre, Hermite, Laguerre polynomials) Sturm-Lioville systems.

6. Partial differential equations, definition, classification and various methods of solution.

7. Calculus of Variations and applications.