UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE:
COURSE REVISED IMPLEMENTATION DATE: September 1998
COURSE TO BE REVIEWED: September 2002
(Four 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 the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: **PHYSICS**

PHYSICS 381		**3**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

MATHEMATICAL PHYSICS
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

The object of this course is to give the student a wide arsenal of mathematical techniques, tools and tricks to increase their ability in setting up and solving problems from scratch. 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. Students may obtain credit for either Math 381 or ENGR 381, but not both.

PREREQUISITES: **(PHYS 112, MATH 211, MATH 310) or (PHYS 112, PHYS 221, MATH 211)**
COREQUISITES: **MATH 310**

SYNONYMOUS COURSE(S)
(a) Replaces: _____ *(Course #)*
(b) Cannot take: **Phys 381/Math 381** *(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: **24**
EXPECTED FREQUENCY OF COURSE OFFERINGS:
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): T. Cooper
Chairperson: N. Weinberg *(Curriculum Committee)*
Department Head: G. McGuire
Dean: K. Wayne Welsh
PAC Approval in Principle Date:
PAC Final Approval Date: February 25, 1998

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 (Please check:) ☐ Yes ☐ No

METHODS OF OBTAINING PLAR:

TEXTBOOKS, REFERENCES, MATERIALS:

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

Advanced Mathematics for Scientists and Engineers, Murray R. Spiegel

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 tricks of interchanging 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.