UNIVERSITY COLLEGE of the FRASER VALLEY

PAC FORM #2

COURSE IMPLEMENTATION DATE:[September 2002]
COURSE REVISED IMPLEMENTATION DATE:[ ]
COURSE TO BE REVIEWED DATE:[September 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: SCIENCE / **PHYSICS**

PHYS 352		**3**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

SPECIAL RELATIVITY AND CLASSICAL FIELDS

COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

Einstein's postulate that no energy or information can travel faster than light had considerable consequences for physics. We apply his theory of special relativity to mechanics, electricity and magnetism, and introduce his theory of gravity (General Relativity).

PREREQUISITES: PHYSICS 252 and PHYSICS 222

COREQUISITES: None

SYNONYMOUS COURSE(S)

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

(b) Cannot take N/A for further credit
(Course #)

SERVICE COURSE TO:

(Department / Program)

(Department / Program)

TOTAL HOURS PER TERM: **45**

STRUCTURE OF HOURS:

Lectures:	45	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: **24**

EXPECTED FREQUENCY OF COURSE OFFERING:

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only) **YES** **N/A** **NO** **N/A**

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

TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE: **YES** **N/A** **NO** **N/A**

AUTHORIZATION SIGNATURES:

Course designer(s): R. Woodside

Chairperson: *(Curriculum Committee)*

Department Head: George McGuire

Dean: J. Snodgrass

PAC Approval in Principle Date:

PAC Final Approval Date: March 28, 2001

PHYS 352

COURSE NAME / NUMBER

LEARNING OBJECTIVES / GOALS / OUTCOMES/ LEARNING OUTCOMES:

This is a middle course in the sequence 252, 352, 452. On completion, the successful student will recognize the effects of light's constant speed on mechanics, optics and electromagnetism. The new view of space-time given by special relativity sets the stage for general relativity or Einstein's Theory of Gravity. To do this, the student will learn the language of tensor analysis and differential forms.

METHODS:

The course will be taught using lectures, demonstrations, and computer simulations. Problems will be assigned and marked on a regular basis.

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:

W. Rindler, *Introduction to Special Relativity*, 2nd ed., Oxford (1990)
A. Das, *The Special Theory of Relativity*, Springer - Verlag (1993)

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

Assignments	25%
Mid-term examination	30%
Final examination	45%

COURSE CONTENT:

1. Gallilean Relativity
2. Lorentz Transformation
3. Special Relativity
4. Kinematics in Special Relativity
5. Relativistic Optics
6. Space-time and Four-vectors
7. Relativistic Particle Mechanics
8. Field Transformations
9. Electric Currents and Charge Density
10. Scales and Vector Potential
11. Magnetic Deflection of Charged Particles
12. Curved Space-time
13. Schwarchild Soln. and Black Holes