COURSE IMPLEMENTATION DATE: September 2002
COURSE REVISED IMPLEMENTATION DATE: September 2006
COURSE TO BE REVIEWED: November 2009
(Four years after UPAC final approval 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: **Faculty of Science, Health & Human Services/Physics**

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

SPECIAL RELATIVITY AND CLASSICAL FIELDS
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This is the 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 form, and the use of space-time diagrams.

PREREQUISITES: **PHYS 252 and PHYS 222**
COREQUISITES:

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

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

TOTAL HOURS PER TERM: **75**
STRUCTURE OF HOURS:

Lectures:	**75**	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: **once every two years**

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): Rob Woodside
Chairperson: Gillian Mimmack *(Curriculum Committee)*
Department Head: Norm Taylor
Dean: Jackie Snodgrass
UPAC Approval in Principle Date:
UPAC Final Approval Date: December 14, 2005

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

On course completion the student will be able to:
1. Realize deficiencies of Newtonian space-time;
2. Understand Minkowski's geometry of space-time;
3. Apply the technique to space-time diagrams;
4. Apply Lorentzian tensors to relativise; optics, mechanics, electricity and magnetism;
5. Solve various problems in each of the topic areas listed in the Calendar Description section.

METHODS:

The course will be taught using lectures, seminars, presentations and projects. Problems will be assigned and marked on a regular basis.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

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

METHODS OF OBTAINING PLAR:

Departmental Review and/or Course Challenge

TEXTBOOKS, REFERENCES, MATERIALS:

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

W. Rindler, Introduction to Special Relativity, 2nd ed., Oxford (1990)

A. Das, The Special Theory of Relativity, Springer - Verlag (1993)

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

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

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

COURSE CONTENT:

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

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