### 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**

**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

(b) Cannot take N/A for further credit

**SERVICE COURSE TO:**

- (Course #)

- (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 |

**MAXIMUM ENROLMENT:** 24

**EXPECTED FREQUENCY OF COURSE OFFERING:**

**WILL TRANSFER CREDIT BE REQUESTED?**

- (lower-level courses only)

  - YES
  - N/A
  - NO
  - N/A

- (upper-level requested by department)

  - YES
  - NO
  - X

**TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:**

- YES
- N/A
- NO
- N/A

---

**AUTHORIZED SIGNATURES**

Course designer(s):

R. Woodside

Chairperson:

(Curriculum Committee)

Department Head:

George McGuire

Dean:

J. Snodgrass

PAC Approval in Principle Date: March 28, 2001
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 ___ NO ________

METHODS OF OBTAINING PLAR:
Course challenge

TEXTBOOKS, REFERENCES, MATERIALS:

SUPPLIES / MATERIALS:

STUDENT EVALUATION:
Assignments 25%
Mid-term examination 30%
Final examination 45%

COURSE CONTENT:
1. Galilean 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