## OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.

### FACULTY/DEPARTMENT

| ENGR 257 | Faculty of Science, Health & Human Services / Engineering |

### COURSE NAME/NUMBER

| Mathematical Physics |

### FORMER COURSE NUMBER

| 3 |

### UCFV CREDITS

| 3 |

### 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.

**Note:** Students may obtain credit for either MATH 381 or ENGR 257, but not both. This course is cross-listed as PHYS 381.

### PREREQUISITES

MATH 211, one of (PHYS 221, MATH 255) and either PHYS 112 or any other second year Math Course.

### COREQUISITES

### SYNONYMOUS COURSE(S)

- Replaces: n/a

### SERVICE COURSE TO:

- (Department/Program)

### TOTAL HOURS PER TERM

| 75 |

### TRAINING DAY-BASED INSTRUCTION

**Structure of Hours:**

| Lectures: | 75 Hrs |
| Seminar: | Hrs |
| Laboratory: | Hrs |
| Field Experience: | Hrs |
| Student Directed Learning: | Hrs |
| Other (Specify): | Hrs |

### MAXIMUM ENROLLMENT

| 24 |

### EXPECTED FREQUENCY OF COURSE OFFERINGS

| 24 |

### 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): Tim Cooper/Peter Mulhern
- Chairperson: Gillian Mimmack (Curriculum Committee)
- Department Head: Norm Taylor
- Dean: Jackie Snodgrass
- UPAC Approval in Principle Date: December 14, 2005

### OFFICIAL COURSE OUTLINE INFORMATION

Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor.
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, computer simulation, 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:
Departmental Review and/or Course Challenge.

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  20%
Midterm  30%
Final exam  50%

COURSE CONTENT:
[Course content varies by instructor. An example of course content might be:]
Complex numbers: Leibnitz rule and apps to integration
Ordinary Differential Equations with constant co-efficients using operator techniques
Fourier Series
Waves on Strings, Separate Variables
One Dimensional Heat Flow, Leplace's equation in cartesian and polar co-ordinates for finite systems
Special functions of physics (delta, ei(x), erf(x),etc.)
Fourier Transforms, basic theorem, application to integration, Parseval
One dimensional heat flow and Laplace's equation for infinite systems
Laplace equation in three dimensions and solutions as expansions;Sturm Liouville systems