## OFFICIAL COURSE OUTLINE INFORMATION

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

<table>
<thead>
<tr>
<th>FACULTY/DEPARTMENT:</th>
<th>Faculty of Science, Health &amp; Human Services / Physics</th>
</tr>
</thead>
<tbody>
<tr>
<td>COURSE NAME/NUMBER</td>
<td>PHYS 381</td>
</tr>
<tr>
<td>FORMER COURSE NUMBER</td>
<td></td>
</tr>
<tr>
<td>UCFV CREDITS</td>
<td>3</td>
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<tr>
<td>COURSE DESCRIPTIVE TITLE</td>
<td>Mathematical Physics</td>
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### 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 PHYS 381, but not both. This course is cross-listed as ENGR 257.

### PREREQUISITES:

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

### aggregates:

- **TOTAL HOURS PER TERM:** 75
- **TRAINING DAY-BASED INSTRUCTION**
  - **LENGTH OF COURSE:** 
  - **HOURS PER DAY:** 

### TOTAL HOURS PER TERM:

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

### 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):** Tim Cooper/Peter Mulhern
- **Chairperson:** Gillian Mimmack *(Curriculum Committee)*
- **Department Head:** Norm Taylor
- **Dean:** Jackie Snodgrass
- **UPAC Approval in Principle Date:** September 1994
- **UPAC Final Approval Date:** December 14, 2005
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, Laplace’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