### Mathematical Applications in Physics I

**DEPARTMENT OF PHYSICS AND ASTRONOMY**

**MEETING TIME:** 11:00 a.m.-12:15 p.m. TR

**ROOM:** 318 Miller Science building

**INSTRUCTOR:** Walter L. Trinosko

**CONTACT INFO:** (936)468-3001, wtrinosko@sfasu.edu

**OFFICE:** 322-A Miller Science Building

**OFFICE HOURS:** 9:00 -10:00 a.m. and 2:00-3:00 p.m. M-F, or by appointment.

**TEXT:** Mathematical Methods in the Physical Sciences (3rd Ed.) by Mary L. Boas

**PREREQUISITES:** Electricity, Sound, and Light (PHY 132) or Technical Physics II (PHY 242) and Calculus II (MTH 234)

### COURSE DESCRIPTION:

This course covers the formulation and solution of physical problems using vector analysis, complex variables, Fourier series and transforms in addition to differential equations.

### PROGRAM LEARNING OUTCOMES:

- The student will demonstrate proficiency in the basic and applied fields of physics.
- The student will develop effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner.

### STUDENT LEARNING OUTCOMES:

By the end of the course, a successful student will be able to:

- Demonstrate the ability to utilize algebra and the calculus of complex numbers in physics applications.
- Demonstrate skill in using advanced mathematical techniques to solve physics problems in classical mechanics, electricity and magnetism, optics, thermodynamics and quantum mechanics.

### GENERAL EDUCATION CORE CURRICULUM OBJECTIVES / OUTCOMES:

This course is not included in the general education core curriculum.

### HOMEWORK (200):

“Problems worthy of attack prove their worth by hitting back.” Piet Hein (1905-1996).

Problem assignments will be made at the appropriate times. Shortly following the presentation of the pertinent subject material, students will be expected to have worked these problems. Many of the problems will deal with potential theory, electric and magnetic field theory, electric circuits, harmonic oscillator (mechanical, electrical, driven, and damped), vibrating string, and heat flow. At 11:00 a.m. every Thursday morning you can expect to work one or more of these problems as a quiz and hand in another one or two for grading. These homework quiz grades will constitute your homework grade and your homework average will count a maximum of 200 points toward the final grade.

### EXAMS (400):

The course grade will be determined from the scores on three major exams, the final exam and the homework. The exams may be take-home exams in whole or in part and will be given at the appropriate times. Each exam will count a maximum of 100 points each toward the final grade. **The student is expected to be present for all exams.**

### FINAL EXAM (100):

The final exam will be Thursday, December 14, 2017 from 10:30 a.m. - 12:30 p.m. and will count a maximum of 100 points toward the final grade.

### FINAL GRADE:

The final grade will be assigned according to the following:

- 630-700 A
- 560-629 B
- 490-559 C
- 420-489 D
- 000-419 F
**ATTENDANCE:** You are expected to attend every class. If you have more than three unexcused absences, your grade will be decreased by one letter grade. If you arrive more than 10 minutes late you will be marked as tardy and three tardy marks count as an absence.

If you become ill or have a restroom emergency during the lecture, please excuse yourself quietly. If you need to study for another class, the library is available. If you need to nap, that is best done at home – not in the classroom.

**SUGGESTIONS FOR MAKING A GOOD GRADE:**
- Read your textbook.
- Attend classes regularly and punctually.
- Do your homework yourself.
- Review lecture material daily (Don’t cram).
- Develop and practice good note taking skills.
- Ask questions in class.
- Read your textbook.

**Academic Integrity (A-9.1)**

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

**Definition of Academic Dishonesty**

Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one’s own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one’s paper without giving the author due credit. Please read the complete policy at [http://www.sfasu.edu/policies/academic_integrity.asp](http://www.sfasu.edu/policies/academic_integrity.asp).

**Withheld Grades Semester Grades Policy (A-54)**

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

**Students with Disabilities**

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](http://www.sfasu.edu/disabilityservices/).

**Student Code of Conduct: Policy 10.4**

Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program. Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This policy applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the iCare: Early Alert Program at SFA. Information regarding the iCare program is found at [https://www.sfasu.edu/judicial/earlyalert.asp](https://www.sfasu.edu/judicial/earlyalert.asp) or call the office at 936-468-2703.