



Physics 517, Principles of Mathematical Physics, Fall 2020 ***FULLY WEB-BASED COURSE***

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Text: *Mathematical Methods for Physicists, G.B. Arfken et al. (any version)*

Description: *Physics 517: Principles of Mathematical Physics, 3 credit hours*

Covers mathematical methods used in classical and modern physics and in the engineering sciences. Prepare students with necessary math skills to be successful in graduate level physics courses. This course will concentrate on the application of mathematical concepts and methods. Topics include vectors and curvilinear coordinates, tensor analysis, matrices and linear algebra, operators and eigenvalues, boundary value problems, Fourier and Laplace transforms, partial differential equations of physics, Green's functions, and variational methods. Emphasis is placed on problem solving.

Student Learning Outcomes:

Objective 1: Students will demonstrate that they understand the concept and have learned the basic skills in using vector analysis, power series and complex numbers in solving physics problems

Objective 2: Students will demonstrate that they understand the concept and have learned the basic skills in using linear algebra, vector calculus and tensor analysis in solving physics problems

Objective 3: Students will demonstrate that they understand the concept and have learned the basic skills in solving differential equations, using functions of complex variables and the calculus of variations in solving physics problems

Homeworks (60%):

Homework will be assigned regularly. The homework counts **60%** towards the final grade.

All homeworks should be submitted as PDF files preferably prepared using Latex (this will prepare you well to write your thesis and papers for publications in professional journals).

Exams (40%):

Two exams contributing **40%** towards the final grade will be given during the semester, the exact time will be announced at least one week in advance. **Students must do their own work within a limited time period without consulting anyone.**

Exam 1: Vector calculus, delta functions, vector analysis in curved coordinate systems, determinants and matrices

Exam 2: Complex algebra, Fourier Series, functions of a complex variable & applied differential equations

Grading:

| | |
|------------|-----|
| Home works | 60% |
| Exams | 40% |

Grade Scale:

| | | |
|--------------|----|---|
| 90 and above | -- | A |
| 80 to 90 | -- | B |
| 70 to 80 | -- | C |
| 60 to 70 | -- | D |
| below 60 | -- | F |

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](#).

<http://www.tamuc.edu/admissions/registrar/documents/studentGuidebook.pdf>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: [Netiquette](http://www.albion.com/netiquette/corerules.html)
<http://www.albion.com/netiquette/corerules.html>

TAMUC Attendance

For more information about the attendance policy please visit the [Attendance](#) webpage and [Procedure 13.99.99.R0.01](#).

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

ADA Statement

Students with Disabilities

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce Gee
Library- Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: Rebecca.Tuerk@tamuc.edu

Website: [Office of Student Disability Resources and Services](http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/)
<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Web url:
<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.