

Course syllabus
PHYS 6350: “Mathematical Physics I”
Fall 2025

Instructor: Joseph Romano

Office: BINAB 2.122

Phone: 956-882-7151 (V. Penix, STSSI program coordinator)

Email: joseph.romano@utrgv.edu

Office hours: TTh: 11:00am-12:30pm and by appointment (in-person or via zoom)

Lectures: Tues / Thurs: 9:30am – 10:45pm (BMAIN 1.508)

Course website: <https://josephromano.github.io/PHYS6350/>

Required textbook: None required, but see course website for suggested reading material, etc.

Course description: This graduate course will include linear algebra, ordinary and partial differential equations, special functions, eigenvalue problems, complex analysis, group theory. [NOTE: Given students background we will cover a subset of these topics or additional topics as appropriate.]

Prerequisites: Two semesters of undergraduate mathematical methods or permission of instructor.

Student learning outcomes: To be able to apply various mathematical techniques to solve problems in physics at the graduate level.

Class attendance: Students are expected to attend all scheduled classes. UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics, accommodation by Student Accessibility Services (SAS), observance of religious holy days, or military service. Accommodations related to long-term complications from medical conditions should go through SAS. Students should contact me before the excused absence and arrange to make up missed work or examinations.

See “course calendar” on the course website, which specifies exam dates and tentative list of topics.

Make-up policy: Make-up exams will not be given.

Exams: Four exams will be given throughout the semester. The final will be a cumulative oral exam.

Problem workbook: You should keep a notebook with all your worked problems. I will check this notebook four times during the semester, before exams. It will count 10 points toward your final grade.

Grading:

Exams: $4 \times 20\% = 80\%$

Problem workbook: 10%

Oral final: 10%

Course calendar
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Topics: (tentative list)

Review of vector calculus

Linear algebra, eigenvalue/eigenvector problem

Complex analysis

Fourier analysis, Fourier transforms

Boundary value problems: differential operators, Green's functions, orthonormal functions

Probability and statistical inference

Important dates:

Mon, Sep 2, 2025: 1st day of classes

Thu, Fri Nov 27, 28, 2025: Thanksgiving holiday (no classes)

Thu, Dec 11, 2025: study day, no classes

Fri, Dec 12 -Thu, Dec 18, 2025: Final exam week

Problem workbook / Exam dates:

PWB, Exam 1: Tues, Thu, Sep 23, 25, 2025

PWB, Exam 2: Tues, Thu, Oct 14, 16, 2025

PWB, Exam 3: Tue, Thu Nov 4, 6, 2025

PWB, Exam 4: Tue, Thu Dec 2, 4, 2025

Oral final: during final exam week

UTRGV POLICIES, ETC.

STUDENTS WITH DISABILITIES

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact **Student Accessibility Services (SAS)** for additional information. In order for accommodation requests to be considered for approval, the student is responsible for providing sufficient documentation of the disability to SAS and participating in an interactive discussion with SAS staff. Accommodations may be requested at any time but are not retroactive. Please contact SAS early in the semester/module for guidance. Students who experience a broken bone, severe injury, or undergo surgery may also be eligible for temporary accommodations.

Pregnancy, Pregnancy-related, and Parenting Accommodations

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Accessibility Services for additional information and to request accommodations.

Student Accessibility Services:

Brownsville Campus: Student Accessibility Services is located in 1.107 in the Music and Learning Center building (BMSLC) and can be contacted by phone at (956) 882-7374 or via email at ability@utrgv.edu.

Edinburg Campus: The Student Accessibility Services Office is in 108 University Center (EUCTR) and can be contacted by phone at (956) 665-7005 or via email at ability@utrgv.edu.

MANDATORY COURSE EVALUATION PERIOD

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (<http://my.utrgv.edu>); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available on or about the end of November.

SCHOLASTIC DISHONESTY

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations, STU 02-100, and UTRGV Academic Integrity Guidelines). **All scholastic dishonesty incidents will be reported to Student Rights and Responsibilities.**

SEXUAL MISCONDUCT and MANDATORY REPORTING In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report to the Office of Institutional Equity & Diversity (oi@utrgv.edu) any instance, occurring during a student’s time in college, of sexual misconduct, which includes sexual assault, stalking, dating violence, domestic violence, and sexual harassment, about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like confidential assistance, or have questions, they can contact OVAVP (Office for Victim Advocacy & Violence Prevention) at (956) 665-8287, (956) 882-8282, or OVAVP@utrgv.edu.

COURSE DROPS

According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

STUDENT SERVICES

Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Students Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor’s office hours. University Resources include the Advising Center, Career Center, Counseling Center, Learning Center, and Writing Center. The centers provide services such as tutoring, writing help, counseling services, critical thinking, study skills, degree planning, and student employment. In addition, services such as the Food Pantry are also provided. Locations are listed below.

Center Name	Brownsville Campus	Edinburg Campus
Advising Center AcademicAdvising@utrgv.edu	BMAIN 1.400 (956) 665-7120	ESWKH 101 (956) 665-7120
Career Center CareerCenter@utrgv.edu	BCRTZ 129 (956) 882-5627	ESSBL 2.101 (956) 665-2243
Counseling Center Counseling@utrgv.edu	BSTUN 2.10 (956) 882-3897	EUCTR 109 (956) 665-2574

Counseling and Related Services List		
Food Pantry FoodPantry@utrgv.edu	BCAVL 101 & 102 (956) 882-7126	EUCTR 114 (956) 665-3663
Learning Center LearningCenter@utrgv.edu	BMSLC 2.118 (956) 882-8208	ELCTR 100 (956) 665-2585
Writing Center WC@utrgv.edu	BUBLB 3.206 (956) 882-7065	ESTAC 3.119 (956) 665-2538