



Modern Physics

Physics 321-001

COURSE SYLLABUS: SPRING 2024

INSTRUCTOR INFORMATION

Instructor: (Name & Title)	Prof. A. R. Chourasia
Office Location:	S-113
Office Hours:	2 – 4 PM
Office Phone:	903-886-5491
Office Fax:	903-886-5480
University Email Address:	anil.chourasia@tamuc.edu
Preferred Form of Communication:	email
Communication Response Time:	24 hours (except during weekends)

COURSE INFORMATION

Textbook(s) Required	MODERN PHYSICS SERWAY, 3rd Edition, 2005 ISBN: 9780534493394 Publisher: CENGAGE L
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Optional Texts and/or Materials will be provided in the class

Course Description

Atomic Physics: Three semester hours

A study of special relativity, photoelectricity, atomic structure and spectra, X-rays, and the wave nature of matter.

The course focuses on quantization of charge, light, and energy, the photoelectric effect, Compton effect, Atomic spectra, Rutherford scattering, elementary quantum mechanics, and relativity

Prerequisites: Lvl U PHYS 2426 Min Grade C and Lvl U MATH 314 Min Grade C
or Lvl U MATH 2415 Min Grade C

The syllabus/schedule are subject to change.

Student Learning Outcomes

1. You will be able to determine the interaction of electrons and x-rays with matter
2. You will be able to work on problems related to quantization of charge, light, and energy
3. You will be able to calculate energies and transition energies of various levels
4. You will be able to calculate the energies associated with infinite square well and harmonic oscillator
5. You will be able to calculate the relativistic effect on time and length Measurements
6. You will be able to apply three dimensional quantum mechanics to various problems

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Understanding of electric and magnetic fields and their interaction with charges

Instructional Methods

Class room lecture

Student Responsibilities or Tips for Success in the Course

Students who do well in this course share most of the following common habits:

1. Being honest with yourself regarding the homework
2. Conference with the instructor
3. Arriving a couple of minutes early for class and not leaving until the class is dismissed
4. Not using phones, tablets, or computer during the class
5. Checking MyLeo often for announcements and assignments
6. Completing and turning in all assignments on time
7. Seeking help and advice early in the semester
8. Taking responsibility for their own grade

GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%

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B = 80%-89%
C = 70%-79%
D = 60%-69%
F = 59% or Below

The grade will be determined from homework, two exams, and the final exam as outlined below:

- Homework and attendance 20 %
(Late Homework penalty 10% each class day)
- Two Exams 25 % each
- Final exam (comprehensive) 30 %

Assessments

Please see the Grading section

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:

<https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements>

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

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Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

<https://community.brightspace.com/support/s/contactsupport>

Interaction with Instructor Statement

The graded homework, and the tests (except the finals) will be returned in due time to the students as a feedback for the course.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

Missing an exam without first making arrangements for make-up with the instructor (excused absence cleared before the exam) will automatically consume the failing grade. Missing other class periods will result in penalties as described under the attendance section below.

Policy for the Test:

- (1) Do not use cell phone
- (2) Do not share calculator
- (3) No bathroom break allowed

Policy for the Final Test:

- (1) Max time allowed is 2½ hours from the scheduled start time
- (2) Do not use cell phone
- (3) Do not share calculator
- (4) Only one bathroom break, with permission, with a max time of 5 min. will

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be allowed

Any decision to curve the grade will be taken at the end of the semester
Five unexcused absences will automatically result in a failing grade

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/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:

<https://www.britannica.com/topic/netiquette>

TAMUC Attendance

For more information about the attendance policy please visit the [Attendance](http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx) webpage and [Procedure 13.99.99.R0.01](http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx).

<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)

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

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

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

Students with Disabilities-- ADA Statement

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 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: studentdisabilityservices@tamuc.edu

Website: [Office of Student Disability Resources and Services](#)

<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.

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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.

A&M-Commerce Supports Students' Mental Health

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

AI use policy [Draft 2, May 25, 2023]

Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty

13.99.99.R0.10 Graduate Student Academic Dishonesty

COURSE OUTLINE / CALENDAR

Lecture (Tentative)

Chapter 3	The Quantum Theory of Light (Jan. 10 – Jan. 26)
Chapter 4	The Particle Nature of Matter (Jan. 29 – Feb. 9)
	FIRST TEST (Feb. 16)

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Chapter 5	Matter Waves (Feb. 12 – 26)
Chapter 6	Quantum Mechanics in One Dimension (Feb. 28 – Mar. 25)
	SECOND TEST (Mar., 29)
Chapter 1	Relativity I (Apr. 1 – Apr. 10)
Chapter 8	Quantum Mechanics in Three Dimension (Apr. 12 – 19)
Chapter 9	Atomic Structure (Apr. 22 – 26)
Chapter 10	Statistical Physics (Apr. 29 – May 3)

Final Exam is on Monday, May 6 at 10:30 AM