PHYS 3490 – Selected Topics: Radiation Detection  
PENS Department and the Texas Physics Consortium  
Spring 2017

A. COURSE INFORMATION

Course number/section: PHYS 3490.001  
Class meeting times: TR 12:30-01:45pm  
Class location: CCH-221, TTVN Video Classroom  
Course Website: http://wtclass.wtamu.edu/

B. INSTRUCTOR INFORMATION

Instructor: Dr. Mark Harvey  
Office location: Texas Southern University, Spearman 205  
Office hours: MW 1-2pm, TR 1-3pm (tentative)  
Telephone: 713-313-1864  
e-mail: harveymc@tsu.edu  
Appointments: Email

Local Facilitator: Dr. Jeffery Spirko  
Office location: NRC-1111 (inside NRC-1100 suite, near the Texas Spill Control School)  
Office hours: MW 2-4, R 10-12, Live Calendar: http://tinyurl.com/spirkocal  
Telephone: 361-825-6020  
e-mail: jeffery.spirko@tamucc.edu  
Appointments: Email for appointments. Check calendar and suggest an open time.

C. COURSE DESCRIPTION

Catalog Course Description
Subject materials will be chosen from Electromagnetic Field Theory, Thermodynamics, Mathematical Methods of Physics, Waves and Optics, Advanced Modern Physics, Quantum Theory, Computational Physics, Geophysics, Environmental Physics and Medical Physics. May be repeated for credit if topics selected are different.

Extended Course Description
An overview of nuclear radiation sources, interactions, and measurement techniques appropriate for physics majors.

This course is being offered by the Texas Physics Consortium as part of the Joint BS degree with a Physics Major. All TPC courses use the WTClass system for class management (instead of Blackboard). For more information on TPC, please visit our website (http://www.tarleton.edu/tpc/) or speak with the Local Facilitator.

The Course Syllabus from the sending institution is attached and is the primary Syllabus that the instructor will follow. This Syllabus exists to make sure you have all of the information summarized in one place and that you are informed about TAMUCC
policies.

D. PREREQUISITES AND COREQUISITES

Prerequisites
- TAMUCC PHYS 3334, Modern Physics I (may be taken simultaneously)

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbooks

Supplies
- Internet access is vital for interacting with the instructor and the local facilitator.
- Access to a scanner may be required to submit homework assignments. The Local Facilitator can help with this.

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

Specific learning objectives will be shared by the instructor in the Syllabus and during Class.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Classes will be held via live a video conference among all of the Texas Physics Consortium schools. Students will be able to ask questions during class, and the instructor will see who is asking the question.

H. MAJOR COURSE REQUIREMENTS AND GRADING

In-class quizzes, exams, and lab reports will be used to assess student learning and determine grades.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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2
Midterm Exam | 30%
Lab Reports   | 30%
Final Exam   | 30%
Quizzes      | 10%

I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
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<tbody>
<tr>
<td></td>
<td>Radiation Sources</td>
<td>Chap 1</td>
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<td></td>
<td>Radiation Interactions</td>
<td>Chap 2</td>
<td></td>
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<td></td>
<td>Counting Statistics and Error Prediction</td>
<td>Chap 3</td>
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<td></td>
<td>General Properties of Radiation Detectors</td>
<td>Chap 4</td>
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<tr>
<td>Thu 5/12</td>
<td>Midterm Exam</td>
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<td></td>
<td>Ionization Chambers</td>
<td>Chap 5</td>
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<td>Proportional Counters</td>
<td>Chap 6</td>
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<td>Geiger-Mueller Counter</td>
<td>Chap 7</td>
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<tr>
<td>Thu 5/4 12:30 pm</td>
<td>Final Exam</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

Lab Experiments: Nuclear Physics Laboratory I (Geiger-Mueller Counter)
- Experiment 1: Determining the Operating Plateau for the Geiger-Mueller Tube
- Experiment 2: Resolving Time Corrections
- Experiment 3: Geiger-Mueller Tube Efficiency
- Experiment 4: Inverse Square Law
- Experiment 5: Statistical Variation of Data
- Experiment 6: Range of Alpha Particles
- Experiment 7: Absorption of Beta Particles
- Experiment 8: Linear Absorption Coefficient (Gamma Decay)
- Experiment 9: Study of GM Counter for Gammas and Betas
- Experiment 10: Beta Backscattering as a Function of Atomic Number
- Experiment 11: Half-Life Measurement

J. COURSE POLICIES

Attendance/Tardiness
Excessive tardiness will not be permitted.
Late Work and Make-up Exams
In the event of significant personal problems (i.e. medical, family, etc.), which might cause the student to miss many classes, the Dean of Students is available to counsel you on how to meet your academic responsibilities. It is your obligation to make these arrangements and not go to the instructor (particularly at the “last minute”).

Cell Phone Use
Cell phone and/or computer usage is NOT recommended during class time.

Laptop Use
(see above)

Food in Class
TAMUCC Media Services determines whether food is allowed in the TTVN room.

Missed Exam
(see above)

K. COLLEGE AND UNIVERSITIY POLICIES

- Academic Integrity (University)
University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- Classroom/Professional Behavior
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- Statement of Civility
Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational
experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation **WILL NOT** automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that **must** be submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  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 believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access
issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

http://disabilityservices.tamucc.edu/

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. **OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

- The Local Facilitator is happy to help with physics questions and with administrative matters, but you, the student, are responsible for keeping track of assignments and exams. Don’t assume that the Local Facilitator knows when your exams are taking place. Keep in touch; let us know when things are happening. Proctoring takes at least a few days to arrange, so make sure things are ready and confirmed **BEFORE** your exam takes place.

- The Course Syllabus from the sending institution is attached and is the primary Syllabus that the instructor will follow.

**GENERAL DISCLAIMER**

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.