Course Syllabus

**Lecturer:** Dr. D. J. Drake  
Email: djdrake@valdosta.edu  
Website: http://mypages.valdosta.edu/djdrake/index.html  
Office: Nevins Hall 2210  
Office hours: T&R 12:30-1:30 pm, F 12:00-1:30 pm, and by appointment


**Prerequisite:** PHYS 2212K and MATH 2263

**Hours of Credit:** 3

**Course Schedule:** TR 11:00am-12:15pm, NH 2031  
Lectures will be devoted to discussing and clarifying text material, to working illustrative problems, and to demonstrating physical principles and their applications. Your experience will be most rewarding if you read the sections to be covered before coming to lecture. You may not understand all the material, but a prior reading will help you focus your attention on the portion of the lecture that covers it. As soon after lecture as possible, study the text and the notes you took in class.

1. You are required to know not only what is covered in the lectures, but also what is covered in the text book.
2. You must bring a scientific calculator to all class and lab sections. *Please note that a cell phone cannot be used in place of a calculator at any time in the course, this includes, but is not limited to, in class assignments, quizzes, tests, and exams.*
3. You are required to take notes in each lecture session. Any student who does not take notes during the lecture will be asked to leave the room.
4. All students must bring two USB thumb drives to all class sections. One will be used for homework and test and one to be used for in-class assignments.
5. All cell phones should remain on silent and out of sight during all scheduled class sessions. This includes lecture, recitation, and laboratory sessions.
6. Students may not wear any hats, caps, or hoods while in the lecture.
7. Any student found sleeping or working on material for another course during the lecture session will be immediately asked to leave, without exception.
8. All VSU-related correspondence should be conducted via VSU email addresses.

**Course Description:** Formulation of equations describing physical systems and the use of computers to solve them, computer simulations of physical systems, the use of computers to acquire and analyze data, and graphical methods of displaying data.
Material to be Covered: This course is designed to give a solid treatment of methods and techniques used in computational physics as well as developing skills for solving computational projects in physics. Those taking this class must be proficient in elementary differential and integral calculus and partial and ordinary differential equations. From an engineering or science perspective, a student will be able to apply basic numerical and computational techniques to solve real world physical problems in order to demonstrate that he/she understands the principles of computational physics.

Educational Outcomes:
1. Outcome: Students will demonstrate knowledge in the field of computational physics. Assessment: All students will take a test to determine their level of understanding of the concepts in computational physics both at the beginning of the course and at the end.
2. Outcome: Students will effectively use computers and calculators for scientific calculation and word processing. Assessment: Students will use computers with C++ to create numerical simulations of real world problems. Students will apply several techniques to a chosen problem and write a paper which outlines the benefits or disadvantages of each method.

Final Course Grade: A letter grade is determined only at the end of the term. Course grades will be based on test grades, final exam grade, assigned homework, laboratory work, and quizzes. The relative weight is the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Exam</td>
<td>35%</td>
</tr>
<tr>
<td>Tests</td>
<td>15% each</td>
</tr>
<tr>
<td>Homework and In-class Assignments</td>
<td>20%</td>
</tr>
</tbody>
</table>

The course grading scale will be follows:

- A: 88% - 100%
- B: 77% - 87%
- C: 66% - 76%
- D: 55% - 65%
- F: 0 - 54%

Final Exam: Each student will be given a different problem in modern physics. The students will then choose three of the numerical techniques discussed to perform computer simulations, one of which must be coded in C++. A 7-10 page paper will be due on the day of the exam along with the code for the simulations. The paper must describe (1) the concept and its application in the real world; (2) a brief discussion of each method chosen; (3) the benefits and disadvantages of each method in solving this particular problem. Papers must be double spaced in 12 point Times New Roman font with 1” margins. All papers must have the page number in the bottom right hand corner, except the cover page which should list the title, your name, date, and the course title and number. A reference page must be included and all references must be formatted in the style of Physical Review. More information about exact content and layout will be given in class. All Final Exam projects are due by the end of the scheduled exam period which is Wednesday, December 9, 2015 at 12:15 PM.
Tests: During this semester you will have three closed book tests, dates to be announced in class. You will be allowed a calculator (cannot be shared with another student), pencil/pen and scrap paper. All tests must be turned in at the end of the class period with no exceptions. Make-up tests can be granted only if the absence is considered an excused absence as listed in the attendance policy below. Attached is a copy of the grading rubric for tests.

Homework and In-class Assignments: Homework will be given on a weekly basis on the material discussed in class. Most homework will involve writing a computer code in C++ and analyzing the results. Students will be expected to turn in a 5-7 page paper on the day the assignment is due. This paper must briefly discuss the problem presented, the computational method(s) chosen to solve the problem, and discussion of the results along with figures showing your results. An example paper has been attached at the end of the syllabus. Additionally, there will be short in-class assignments given on a daily basis. No make-ups will be given for missed homework or in-class assignments. Attached is a copy of a grading rubric for homework and in-class assignments. All students are required to bring a USB thumb-drive to the class. Students will not be allowed to share USB thumb-drives.

Attendance Policy: The university attendance policy states, "The university expects that all students shall regularly attend all scheduled class meetings held for instruction or examination." An attendance sheet will be provided at all lectures, recitation, and laboratory meetings. You are expected to sign the sheet for all scheduled sessions. In addition, "All students are held responsible for knowing the specific attendance requirements as prescribed by their instructor. . . . When students are to be absent from class, they should immediately contact the instructor. A student who misses more than 20% of the scheduled classes of a course will be subject to receiving a failing grade in the course." Any student missing more than 20% of the lecture and recitation sections will automatically receive a failing grade for the course. Alternatively, any student missing 20% or more of the assigned laboratory sessions will be subject to a failing grade for this course. For this course that is equivalent to missing 6 sessions.

There are six categories of acceptable reasons under which a student may request a make-up test or exam. Make-up tests will be determined by the professor and at the sole discretion of the professor. These assignments may or may not exactly duplicate the original test or exam.

- **Death or serious illness in the immediate family.** The immediate family includes spouse, children, parent, siblings, grandparents and uncles/aunts. Verification may be required.
- **Serious illness or injury of the student.** A physician/health care professional must be consulted about the injury or illness, and home-rest or hospitalization that would prevent your attendance, must be prescribed. **Required Verification:** A letter from the student’s physician is required, noting the duration of the time that the student was directed to rest at home.
- **Court ordered appearances or a call to jury duty.** **Required Verification:** A copy of the official notification.
- **Military duty and deployments.** **Required Verification:** A duty bill, note from the commanding officer or a copy of the deployment orders is required.
- **Religious prohibitions.** Verification may be required.
- **Collegiate Athlete.** Verification required.
Student Opinion of Instruction (SOI): At the end of the term, all students will be expected to complete an online Student Opinion of Instruction survey (SOI) that will be available on BANNER. Students will receive an email notification through their VSU email address when the SOI is available (generally at least one week before the end of the term). SOI responses are anonymous to instructors/administrators. Instructors will be able to view only a summary of all responses three days after they have submitted final grades. While instructors will not be able to view individual responses or to access any of the data until after final grade submission, they will be able to see which students have or have not completed their SOIs, and student compliance may be considered in the determination of the final course grade. These compliance and non-compliance reports will not be available once instructors are able to access the results. Complete information about the SOIs, including how to access the survey and a timetable for this term is available at http://www.valdosta.edu/academic/OnlineSOIPilotProject.shtml.

Disruptive Behavior Policy: Disruptive students may be removed from the class. Disruptive behavior includes but is not limited to: offensive language and behavior, incessant talking, interrupting class with personal or non academic concerns, distracting students from the task at hand, drawing on desk tops, taking frequent unscheduled breaks, annoying other students, tardiness, leaving early, using cell phones, or pagers in class, etc. All cell phones, pagers, and beepers must be turned off or set on vibrate during class time. If you realize that you have an incoming call that you must attend to, leave the room quietly to do so. Do not attend to it in class. Students are responsible for being aware of the policies, procedures and student responsibilities contained within the current edition of the Valdosta State University Catalog and Student Handbook.

Classroom and Laboratory Emergency Procedure: In the event of a bomb threat, tornado, or fire, students and staff may be asked to evacuate the building or move to a secure location within the building. Evacuation routes for movement to an external location or to a shelter within the building are posted at the front of the room. Students should review the maps and make sure that the exit route and assembly location for the building are clearly understood. If you have a disability that may require assistance during an evacuation, please let your faculty know at the end of the first class.

Disability Services Policy: Reasonable accommodations will be made for students with disabilities provided those students have registered with the Access Office for Students with Disabilities in Faber Hall. The phone numbers are 229-245-2498 (V), 229-375-5871 (VP), and 229-219-1348 (TTY). Present your instructor with the documentation.

Technology Assistance: This course will require access to the internet for all homework and pre/post-lecture assignments. Students having technology problems may contact the Help Desk by phone at 229-245-4357 or e-mail a question at helpdesk@valdosta.edu. The Help Desk is located on the 2nd floor of the Odum Library.

Academic Misconduct and Dishonesty Policy: Students are expected to abide by the VSU Academic Integrity code. "Academic integrity is the responsibility of all VSU faculty and students. Faculty members should promote academic integrity by including clear instruction on the components of academic integrity and clearly defining the penalties for cheating and plagiarism in their course syllabi. Students are responsible for knowing and abiding by the Academic Integrity
Policy as set forth in the Student Code of Conduct and the faculty members’ syllabi. All students are expected to do their own work and to uphold a high standard of academic ethics.” Violation of academic honesty includes, but is not limited to, the following actions:

1. Cheating on an examination or quiz – either giving or receiving information.
2. Copying information from another person for graded assignments, including that information obtained from an Internet source.
3. Using unauthorized materials during tests.
4. Collaborating during examinations.
5. Buying, selling or stealing examinations.
6. Arranging a substitute for oneself during an examination.
7. Substituting for another person, or arranging such a substitution.
8. Plagiarism – the intentional or accidental presentation of another’s words or ideas as your own.
9. Submission of work other than your own for written assignments.
10. Incorporating the words or ideas of an author into one’s paper without giving the author due credit.
11. Collaboration with another person or persons in submitting work for credit in class or lab, unless such collaboration is approved in advance by the instructor.

Any student found committing any of these violations will automatically receive a failing grade for the entire course. For more information visit http://www.valdosta.edu/academics/academic-affairs/vp-office/academic-honesty-policies-and-procedures.php

Course Compliance Statement: Enrollment in this class signifies that the student has agreed to abide by and adhere to the policies and regulations specified above. It is understood that the instructor may adapt or change this syllabus and the assignments contained within it according to circumstances that may arise during the course of the semester.

“I do not feel that the same God who has endowed us with sense, reason, and intellect has intended us to forego their use.”

-Galileo