Department: Physics and Engineering  
Course Number: PHY 255 and 256  
Credit Hours: 4 and 1 hours

I. **Title:**  
PHY 255- Electricity, Magnetism, and Light  
PHY 256- Electricity, Magnetism, and Light Laboratory

II. **Catalog Description:** Electric and magnetic fields, circuits, electromagnetic oscillations, and optics. Calculus with vector notation used. PHY 255 and PHY256 must be taken concurrently. Four lectures per week for PHY 255. PHY 256 has two hours laboratory per week.

III. **Purpose:** This course is designed for students planning to pursue a technical career (physics, engineering physics, pre-engineering, computer science, chemistry, medicine, etc.). Its basic purpose is to provide a foundation in electricity, magnetism, and optics at the general physics level with calculus-based concepts and computations.

IV. **Course Objectives:** The student should gain an understanding of, and proficiency in the following:  
A. The experimental foundations upon which physics is based.  
B. The development of physical laws, and their expression in the form of mathematical models.  
C. The application of physical laws in the solution of problems.  
D. The development of analytical, logical thought processes which are required for problem solution, and which are also applicable in analyzing situations which occur in everyday life.  
E. The experimental techniques which are used in science.  
F. A familiarity with laboratory equipment and measuring devices.

V. **Content Outline:**  
A. Electric Fields  
B. Electric Potential  
C. Capacitance and Dielectrics  
D. Electric Current  
E. Direct Current Circuits  
F. Magnetic Fields  
G. Magnetic Induction  
H. Alternating Current Circuits  
I. Maxwell’s Equations and Electromagnetic Waves  
J. Light  
K. Geometrical Optics  
L. Interference and Diffraction

VI. **Instructional Activities:** Lecture, discussion, problem solution, laboratory, and examinations. Problem solution by computer is planned.

VII. **Field, Clinical, and Laboratory Experiences:** PHY 256 consists of one 2-hour laboratory per week, with experiments complementing the PHY 255 lecture material.

VIII. **Resources:**
IX. **Grading Procedures:** Performance on regular examinations, homework sets, and a comprehensive final exam will be considered in determining the course grade.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Three Hourly Exams (20% each)</td>
<td>60%</td>
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<tr>
<td>Homework</td>
<td>10%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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A= 90-100   B= 80-89   C= 70-79   D= 60-69   E= 0-59

The PHY 256 final grade is based upon the laboratory reports. A report is submitted for each experiment performed.

X. **Attendance Policy:** An attendance record will not be kept. Each student will be held responsible for all material covered, homework assignments made, changes in exam time, etc. that might have occurred during missed periods.

Make-up: No make-up tests will be given. If a test is missed for any reason, the test portion of the final grade will be determined from the average of the tests taken.

XI. **Academic Honesty Policy:** Complete academic integrity is expected of all students. Graded individual assignments and examinations should consist solely of the work of that individual whose name is on the document. Cheating on examinations will not be tolerated. Cheating is defined to be the use of any unauthorized source of information for the purpose of deceiving the instructor in evaluating the student’s performance or to gain an unfair advantage over fellow students. Students who are caught cheating will receive a failing grade in the course.

XII. **Text:** Physics for Scientists and Engineers, 5th Ed., Serway.

XIII. **Prerequisites:** Prerequisite- PHY 235 and 236, MAT 250; Corequisite- PHY 256, MAT 308