Location and Time: SC 127 MWF 1:00 – 2:50 pm

Instructor: Dr. John Filaseta
Office: SC 146
Phone: 572-5170

Office Hours: MWF: 10 - 11:00 am, TR 2 – 3:00 pm
or by appointment

Email, Web Page: Filaseta@nku.edu www.nku.edu/~filaseta

Required Materials: Physics for Scientists and Engineers, Volume 1, by Randall D. Knight.
Student Workbook: Physics (paperback), Volume 1, by Randall D. Knight.
Discovery Physics (manual) by John E. Filaseta.
Plastic ruler (clear is best): 6 or 12 inches in length.
Calculator (about $10): A nonprogrammable, nongraphing calculator that performs trig functions but does not store text. If you are unsure your calculator is acceptable for exams ask the instructor before the 1st exam.

Supplements (optional): Use of Blackboard (learnonline.nku.edu) to see assignment pages, homework solutions, updates on your grade, exam reviews, and selected in-class handouts.
Student Solution Manual by Kahol and Foster.
Web site for “ActivPhysics Online”: www.aw-bc.com/knight. We will make use of some of these simulations in class; and you may wish to study them further on your own. But this site is slow loading applications even with high speed Internet access.

Pre- or co-requisite: MAT 121 or MAT 120 (first semester of calculus).

Objective: A calculus-based introduction to classical physics using guided inquiry activities. Topics: kinematics, forces, Newton's Laws of Motion, motion in 2-dimensions, curvilinear motion, work, energy, momentum, conservation principles, rotational motion, and static equilibrium. Course includes techniques for data acquisition and experimental error analysis.

Learning Approaches:
When studying a new concept or problem, there is often more than one approach to learning and solving. These approaches include:

1. Visual or graphical representations,
2. Verbal or descriptive responses; and
3. Analytical or mathematical reasoning.

Some people may seem to learn quickly by using only one of the approaches above, but most people gain greater insight by using all of these approaches. For example, an application of velocity and acceleration may be strictly mathematical, but by looking at the same application using graphs and visualizing motion one can gain greater insight; and when asked to use words to describe the application of these terms one can again gain a greater understanding. This course will employ all of these approaches for in-class questions and activities (experiments), homework and testing.

Attendance & Effective Use of Class Time:
Students should come prepared before class starts:

1. Read ahead. Read topic from textbook (following the Assignment Page) to gain some understanding of basic definitions and concepts before topic is covered in class. Complete work from the pages of the Discovering Physics manual (and the student workbook) that were discussed in the previous class and be prepared to answer questions from the next few pages in the manual (and workbook).
2. Bring relevant pages on topic from manual (Discovering Physics) and student workbook (Physics) to avoid receiving a penalty for your in-class grade. Bring a calculator and a ruler.

Class time will be a mix of the following:
1. Instructor giving mini-lectures on the topic of the day.
2. Students writing answers and working out solutions to topic questions in manual (Discovering Physics) and workbook (Student Workbook: Physics). Students usually work in teams of 2 or 3 but occasionally as an individual.
3. Student teams performing activities described in manual (Discovering Physics).
4. Instructor guiding students through solutions to in-class questions.
The use of a studio-style classroom for teaching physics is intended to engage the students in learning during class time. Lecture time is minimized since research shows that students learn better when time is devoted to students conducting activities and responding to questions. As such, regular attendance is critical for student learning and missing class will directly affect your grade in 3 areas (in table below): Attendance (and participation), In-Class Work (collected), and Completed Work on topics (especially activities from manual).

**Grading Attendance (and participation):**
The maximum score (below) is 4 points for attendance (in table below). Missing up to 2 classes still earns the 4 points. For each additional class missed the score will be reduced by ½ point. Missing up to 2 classes is allowed for illnesses or emergencies. Missing more than 2 classes (regardless of reason) results in a lower score as explained. The instructor may reduce the score also for lateness (especially if repeated) or for lack of participation when called upon to answer questions.

**In-Class Work (collected):**
The instructor will collect and grade one or more responses to in-class questions or in-class activities during many class meetings. If a student misses a class meeting (regardless of reason) he/she will receive a zero for in-class work that day, but the two lowest in-class work grades will be dropped before computing his/her semester’s average grade. Dropping the two lowest grades is intended for illnesses or emergencies and is not intended to encourage laziness. Additional drops will not be permitted for any reason. Failure to bring appropriate topic pages from the manual (Discovering Physics) and student workbook (Physics) may also harm the student’s in-class work grade for that day. The average grade will determine as a percentage of the maximum (6 points) to go in the table below.

**Completed Work on Each Topic (“homework”):**
As we complete a topic you are to turn in your completed work on all assigned questions, problems and activities associated with that topic. The Assignment Page gives the complete list of expected work to turn into the instructor by the due date. Note, completed work is due by 5:00 pm on the due date and may be turned in by sliding the homework under the instructor’s office door (SC 146) if he is not available. Instructor will examine all work for completeness and thoroughness, but only certain parts (specific questions, problems or activities) from your collected work will be graded in detail. Not showing work in an organized, thorough manner is a factor that will hurt your grade. Assistance on homework from fellow classmates and the instructor (see office hours above) is allowed. Overdue problems sets will be penalized and may not be graded as carefully. Homework turned in more than two class meetings past the due date will not be accepted or graded. The lowest homework grade will be dropped before determining a student’s semester homework grade. Dropping the lowest grade is intended for illness or emergencies; and is not intended to encourage laziness. Additional drops will not be permitted for any reason.

**Exams:**
Three unit exams and one comprehensive final exam will be given. Exams will be taken without the use of books or notes; however, a nonprogrammable, nongraphing, non-text storing calculator is allowed. Students are expected to know some basic expressions (or equations) and principles that are commonly used in physics; but certain equations that apply to only specific physical situations will be provided with each exam. A brief exam review will be given in class on a day prior to exam day. Being absent from any exam is strongly discouraged. Make-up tests will not be identical to the in-class exam and will be more difficult, could cover topics not specifically mentioned during the exam review, and will be either written, oral, or both.

| Exam I | Vectors, Basics of Kinematics, Understanding Forces and Motion | Sept 23 |
| Exam II | Two-dimensional Motion, Application of Newton’s Laws, Curvilinear Motion and Noninertial Reference Frames | Oct 26 |

**Course Grade (Maximum total point score = 100 points):**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three unit exams</td>
<td>45</td>
</tr>
<tr>
<td>Comprehensive Final</td>
<td>25</td>
</tr>
<tr>
<td>Completed Work on topics/homework (drop low)</td>
<td>12</td>
</tr>
<tr>
<td>In-Class Work (collected) (drop 2 lowest)</td>
<td>6</td>
</tr>
<tr>
<td>Attendance (and participation) (allow 2 absences)</td>
<td>4</td>
</tr>
<tr>
<td>One Formal Lab Report w/ Error Analysis (individual or team report)</td>
<td>5</td>
</tr>
<tr>
<td>Concept Test (near end of semester)</td>
<td>3</td>
</tr>
</tbody>
</table>

Your two-hour Final Exam will start on December 14th at 1:00 pm, and will be comprehensive including the topic of Rotational Motion (not on previous exams). The letter grades will be assigned using the total points score and the standard cut-offs of 90, 80, 70 and 60 for an A, B, C and D respectively.

The instructor reserves the right to modify this syllabus during the semester but will give students advanced notice.