

Colonnade Program Course Proposal: Explorations Category

1. What course does the department plan to offer in Explorations? Which subcategory are you proposing for this course? (Arts and Humanities; Social and Behavioral Sciences; Natural and Physical Sciences)

Physics 101- Concepts of Motion

Subcategory: Natural and Physical Sciences

2. How will this course meet the specific learning objectives of the appropriate subcategory. Please address **all** of the learning outcomes listed for the appropriate subcategory.

1. Demonstrate an understanding of the methods of science inquiry.

This is addressed in several ways: first, many of the concepts in the course are introduced through guided discovery experiments, where students work through structured activities to discover for themselves the principle ideas, so they are to a significant extent experiencing and engaging in scientific inquiry themselves.

2. Explain basic concepts and principles in one or more of the sciences.

The basic concepts of motion, velocity, acceleration, and forces are introduced through class activities which include students using experiments to explain to each other the basic concepts, followed up by assignments where students use motion concepts to explain the phenomena in real-world applications on the project and tests.

3. Apply scientific principles to interpret and make predictions in one or more of the sciences.

The above mentioned assignments involve students interpreting the motion of objects in an experimental setting with controls for mass, slope and distance so they will be able to predict the resulting motion from the initial conditions.

4. Explain how scientific principles relate to issues of personal and/or public importance

- Throughout the semester students will analyze applications in cases such as car collisions, building stresses and bone fracture.
- Regular connections are made between historical progress in science and technology relating to motion and dynamics by contrasting Newtonian concepts with Aristotelian concepts.
- Reading selections of historical and empirical scientific works, class discussions, and essays will seek to help students develop a better understanding of what does and does not constitute valid scientific arguments, which could be applied to better understand technological social issues like energy, sustainability and global warming.

3. Syllabus statement of learning outcomes for course. NOTE: In multi-section courses, the same statement of learning outcomes must appear on every section's syllabus.

As a result of working through this course, you will be able to:

- Explain how objects move when subject to external net forces, the role of inertia and acceleration in motion and the limits of classical concepts of motion.
- Identify various conditions associated with the motion of objects in terms of translation, rotation and vibration.
- Explain the nature of science and scientific knowledge, including the role of evidence and theory, how it is developed and modified, and interaction of science with technology and society.

4. Brief description of how the department will assess the course for these learning objectives.

Essential learning Outcome	Assessment
<i>1. Demonstrate an understanding of the methods of science inquiry.</i>	The results of a Lab activity requiring the explicit use of hypothesis testing via the scientific method will serve as the assessment of this goal.
<i>2. Explain basic concepts and principles in one or more of the sciences.</i>	An exam focusing on foundations of motion and the concepts of motion and with applications that will serve as the assessment tool for this goal.
<i>3. Apply scientific principles to interpret and make predictions in one or more of the sciences.</i>	A lab activity using an application of the principles of motion to predict the outcome of an event will be used as the assessment grade for this goal.
<i>4. Explain how scientific principles relate to issues of personal and/or public importance</i>	A standalone set of quiz questions involving calculations and predictions with specific applications dealing with car collisions and accident reconstruction will be used as the assessment of this goal.

5. How many sections of this course will your department offer each semester?

1

6. Please attach sample syllabus for the course.

Attached is a syllabus from the past semester. This is a course that has evolved over many semesters, and will continue to evolve as the instructors identify better ways to address the learning objectives.

SYLLABUS Physics 101: Concepts of Motion Spring 2014

Office Hours: Conferences may be scheduled on Tuesdays between 10:30 am and 12:00 pm or by special appointment. Please make an appointment via E Mail in order to assure a particular conference time.

Textbook: *There is no required textbook.* The free website ***www.physicsclassroom.com/Class/*** will be used as our resource for reading and supplemental study.

Colonnade Assessment: Through coursework, discussion, readings, reliable resources and empirical exercises the Physics and Astronomy program introduces the scientific method and critical thinking associated with the impact of science on society that prepares students at Western Kentucky University to understand the relevance and excitement of science in the Universe.

Colonnade Goals: Physics 101 meets WKU requirements for a science lab course.

1. Demonstrate an understanding of the methods of science inquiry applied to motion.
2. Explain basic concepts and principles in used to understand motion.
3. Apply scientific principles to interpret and make predictions with regards to object in motion.
4. Explain how scientific principles relate to issues of personal and/or public importance through the application of motion to collisions and accident reconstruction.

Attendance Policy: DO NOT MISS CLASS. In addition, most of the labs and activities require more than one person to accomplish the task. In those cases where an absence is unavoidable, the following policies will be followed:

Exams In order to be eligible to make up a missed exam you must notify me in advance.

You may do this via e-mail or in person. If your absence is determined to be valid, we will schedule a make-up time. Makeup exams will be different than the original and will most likely be administered on Tuesdays. ***Makeup exams must be taken prior to the next class meeting. Only one makeup exam allowed.***

Labs / Activities: Labs / activities done during class will be submitted at that time. Activities assigned as take-home work can be turned in one week late for half-credit. They will not be accepted after one week. ***You are only allowed one excused lab.*** Other missed labs will result in a grade of zero for those labs.

Cell Phones: Please turn cell phones off during class. If an emergency need arises please inform the instructor. Having a cell phone out during any assessment can be considered cheating.

Grades: The following system is used to determine grades.

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Tests (3 @ 100 pts. each)	300 pts.	A = 90% (549 approx.)
Labs / Activities	195 pts.	B = 80% (488 approx.)
Homework/Project	115 pts.	C = 70% (427 approx.)
Total	610 pts. (approx.)	D = 60% (366 approx)

****Together, we can insure your success in this class. Attendance, attention, and effort are the three actions that allow for our mutual involvement. I will do my best to teach in such a way that you will look forward to coming to class, enjoy being an active participant, and inspired to do your best.***

Tentative Schedule for Physics 101: Concepts of Motion Spring 2014

(corresponding study lessons @) www.physicsclassroom.com/Class/

Jan 28 About Science / Graphing

Feb. 4 Linear Motion (1-D Kinematics – Lessons 1,3,5,6)

Feb. 11 Newton's Laws of Motion pt. I (Newton's Laws – Lesson 1,2,3)

Feb. 18 Newton's Laws of Motion pt. II (Newton's Laws – Lesson 4)

Feb. 25 **TEST – Mechanics I**

Mar. 4 Gravity & Circular Motion (Circular Motion and Satellite Motion – Lessons 1,2,3)

Mar. 11 *No Class – Spring Break*

Mar. 18 Momentum (Momentum and Its Conservation – Lessons 1,2)

Mar. 25 Work & Power (Work, Energy and Power – Lesson 1)

Apr. 1 Energy (Work, Energy and Power – Lesson 2)

Apr. 8 **TEST – Mechanics II**

Apr. 15 Waves (Waves – Lessons 1,2,3,4)

Apr. 22 Sound (Sound Waves and Music – Lessons 1,2,3,4,5)

Apr. 29 Light pt. I (Light Waves and Color – Lessons 1,2)

May 6 Doppler Effect, Relativity (Waves – Lesson 3)

May 13 **TEST – Waves, Sound, & Light** (*given during regular class time*)

Drop Dates

Jan. 29 - ***Last day to drop without a grade***

Mar. 21 - ***Last day to drop with a 'W'***

In compliance with university policy, students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for this course must contact the Office for Student Disability Services in DUC A-200 of the Student Success Center in Downing University Center. Please DO NOT request accommodations directly from the professor or instructor without a letter of accommodation from the Office for Student Disability Services.