Center for Talent Development
Northwestern University
Gifted LearningLinks Program

Course Title: Physics Honors Online

Course Description:
Prerequisite: Algebra I & II
This class emphasizes an understanding of the fundamental principals of nature. In this demanding course, students cover a variety of topics in physics including Newtonian physics, electricity and magnetism, waves and optics, as well as early modern physics. Through hands-on experiments and investigation, students come to appreciate the applications of the universal principles of physics, gain an appreciation of mathematics and develop their understanding of the major concepts in physics. This class is designed for very motivated and independent students who wish to prepare for more advanced physics classes.
Note:

- Additional fee of $50 for online labs

High school credit: 2 semesters

Outcomes: Upon successful completion of this course, students will:

- Be able to use mathematical equations to study physical phenomena
- Appreciate the applications of the universal principles of physics
- Gain a realization for the importance of mathematics
- Gain an understanding of the major concepts in physics

Resources and Materials:

Text: *Physics, 6th edition,* Giancoli (2005). Prentice-Hall. ISBN: #0-13-060620-0.

Materials: Notebook, websites and calculator.

Schedule: Note: even problems have answers next to them. Odd problems have answers in the back of the textbook. You may have one week after each 8 week period to review for the unit test.

SEMESTER ONE				
	Topic/Focus	**Activities & Reading Assignments**	**What do I need to post to the Discussion Board?**	**What do I need to turn in?**
Week 1	Orientation to Online Learning	See Webpage		
Week 2	Newtonian Physics	Chapter 2 Reading and Lab Activities	Introduction of Yourself to classmates	Chapter 2: 5, 7, 19 & 23.
Week 3	Newtonian Physics	Chapter 2 Reading and Lab Activities		Chapter 2 : 35, 39, 42 {Ans: a) 10.4m/s, b) .78s, c) up and on the way down.
Week 4	Newtonian Physics	Chapter 2 Reading and Lab Activities		Chapter 2 : 49, 57 & 73.
Week 5	Newtonian Physics	Chapter 3 Reading and Lab Activities		Chapter 3: 9, 11, 19, 21 & 22(Ans: 2.1s)
Week 6	Newtonian Physics	Chapter 3 Reading and Lab Activities		Chapter 3 : 23, 27 & 35 (Give 35 a try !)
Week 7	Newtonian Physics	Chapter 4 Reading and Lab Activities		Chapter 4: 10(12720N), 31, 37 & 45.
Week 8	Newtonian Physics	Chapter 4 Reading and Lab Activities		Chapter 4: 53, 55, 63 (Give it a try!) & 81.
Week 9	Newtonian Physics	Chapter 9 Reading and Lab Activities		Chapter 9: 12, 15 & 20 (Tension = 708N, H = 579.9N, V = 6N, down !)
Week 10	Review for Unit Test.			Submit Test
Week 11	Momentum & Energy	Chapter 5 Reading and Lab Activities		Chapter 5: 3, 7, 9, 19 & 29.
Week 12	Momentum & Energy	Chapter 5 Reading and Lab Activities		Chapter 5: 35, 39 & 40(Give it a try. You can

				just set it up!)
Week 13	Momentum & Energy	Chapter 6 Reading and Lab Activities		Chapter 6: 1-5, 13, 25(Give it a try!) & 31.
Week 14	Momentum & Energy	Chapter 6 Reading and Lab Activities		Chapter 6: 37, 40(h = 2.5r), 43, 51, 52(10.13m/s), 59 & 77.
Week 15	Momentum & Energy	Chapter 7 Reading and Lab Activities		Chapter 7: 2, 3, 5, 7 & 8(13950kg).
Week 16	Momentum & Energy	Chapter 7 Reading and Lab Activities		Chapter 7: 15, 25 & 27.
Week 17	Momentum & Energy	Chapter 16 Reading and Lab Activities		Chapter 16: 11, 13 & 15.
Week 18	Momentum & Energy	Chapter 16 Reading and Lab Activities		Chapter 16: 19, 27, 29 & 49.
Week 19	Momentum & Energy	Chapter 17 Reading and Lab Activities		Chapter 17: 1, 3, 5, 11, 15 & 19.
Week 20	Review for Unit Test			Submit Test
SEMESTER TWO				
	Topic/Focus	**Activities & Reading Assignments**	**What do I need to post to the Discussion Board?**	**What do I need to turn in?**
Week 21	Electricity & Magnetism	Chapter 18 Reading and Lab Activities		Chapter 18: 1, 7, 9 & 11.
Week 22	Electricity & Magnetism	Chapter 19 Reading and Lab Activities		Chapter 19: 1, 3 & 7.
Week 23	Electricity & Magnetism	Chapter 19 Reading and Lab Activities		Chapter 19: 13, 17 & 23.
Week 24	Electricity & Magnetism	Chapter 20 Reading and Lab Activities		Chapter 20: 1, 3, 5, 9 & 11.
Week 25	Electricity & Magnetism	Chapter 20 Reading and Lab Activities		Chapter 20: 27, 29, 33 & 41.

Week 26	Electricity & Magnetism	Chapter 21 Reading and Lab Activities		Chapter 21: 2(Clockwise), 6(-.046Volts) & 9.
Week 27	Electricity & Magnetism	Chapter 21 Reading and Lab Activities		Chapter 21: 11 & 15
Week 28	Electricity & Magnetism	Chapter 22 Reading and Lab Activities		Chapter 22: 5-9
Week 29	Review for Unit Test			Submit Test
Week 30	Optics & Modern Physics	Chapter 23 Reading and Lab Activities		Chapter 23: 3, 13 & 23.
Week 31	Optics & Modern Physics	Chapter 23 Reading and Lab Activities	Review for Unit Test	Chapter 23: 27 & 33.
Week 32	Optics & Modern Physics	Chapter 23 Reading and Lab Activities		Chapter 23: 43 & 45.
Week 33	Optics & Modern Physics	Chapter 24 Reading and Lab Activities		Chapter 24: 1, 3 & 5.
Week 34	Optics & Modern Physics	Chapter 27 Reading and Lab Activities		Chapter 27: 49, 51 & 55.
Week 35	Optics & Modern Physics	Chapter 28 Reading and Lab Activities		Chapter 28: 3, 7 & 19.
Week 36	Review for Unit Test			Submit Test

Student Evaluation and Grading Policies for Credit Courses Only:

CTD Grading scale

A+ 97-100	**B+** 87-89	**C+** 77-79	**D+** 67-69	**F** Below 60
A 93-96	**B** 83-86	**C** 73-76	**D** 63-66	
A- 90-92	**B-** 80-82	**C-** 70-72	**D-** 60-62	

Breakdown of final grade: Tests: 70%, Laboratory 15% and Homework 15%.

Instructor Biography:

Stephen Dickman has a Master of Science in Physics from the University of Iowa. He has taught at Evanston Township High School for 14 years. He has also taught overseas and worked in financial firms in a mathematical capacity. He has taught at the *Center for Talent Development* for 6 years. Mr. Dickman is very passionate about teaching physics and continues to be a student of this amazing field.

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