

**PHYS 2510: University Physics**  
**Course Syllabus for Fall 2010, MW 10:00-11:55 am, T 2:30-5:25 pm**

Instructor: Dr. Wayne Keith: 793-3874, [keith.wayne@mcm.edu](mailto:keith.wayne@mcm.edu)  
Office Hours: S 110-C: MW 1-2, WR 2:30-5, R 11-12, and F 10-12.  
Web: <http://www.mcm.edu/~keith.wayne>  
Text: *Fundamentals of Physics (9<sup>th</sup>)*, by Halliday, Resnick and Walker  
Required: tablet computer, scientific calculator, paper, pen/pencil  
Corequisites: MATH 2421 (Calculus I)

**Course Description:** This is the first part of a two-part series intended for Physics majors and those intending to pursue an engineering degree. It is also recommended for Math, the sciences, and Computer Science majors, who are comfortable with differential calculus. This course covers the fundamentals of mechanics: motion, vectors, forces, momentum, rotational motion, gravity, mechanical energy, and possibly sound. Emphasis is placed on calculus-based problem-solving skills. This course requires concurrent enrollment in the laboratory.

**Course Goals:** The objective of the student is to develop the skills necessary to analyze the behavior of physical systems, primarily the classical mechanical systems, based on Newtonian laws of motion and conservation laws and to learn how to solve basic physics problems from different areas of mechanics.

**Grading:** This course will be taught with a modular structure. Each module will consist of various activities worth differing numbers of points, with the total number of points available for a given module dependent on the number of assignments given. See course schedule (below) for details. When broken down by type, these are the approximate weights for each type of activity.

**26.08%** Daily grades: Class participation, attendance, quizzes and worksheets.

**20.92%** Homework: Online and book homework will be assigned. Homework will be due at the beginning of class on the date indicated.

**35.76%** Laboratory: Pre-labs, lab reports, and one oral presentation.

**10.84%** exams: Five in-class mini-exams.

**6.4%** Final exam: Comprehensive final.

**Attendance/Make up policy:** Attendance is required. Some in-class activities may not be made up, and others may require a formal excuse at the discretion of the instructor. Contacting the instructor via email or phone prior to missing class for any reason is strongly encouraged, even if it is for a school sponsored event.

**Classroom Rules:** Students are expected to be present and on time for all class meetings. Excessive absences (more than 3 consecutive) may result in the student being dropped from the course. Ringing cell phones and other disruptions during class may result in a loss of class participation points or other penalties. Late homework loses 5% per class period.

**ADA Policy:** If you have a documented disability that may impact your performance in this class and for which you may require accommodations, you must be registered with and provide documentation of your disability to the Disability Services Office, Old Main 102, 793-4880.

**Final notes:** Class discussion is strongly encouraged; please feel free to ask questions, during class or outside of class, about anything that is not clear. Properly preparing for class by reading the textbook and keeping up with the homework is the most important factor in doing well in this course.

**PHYS 2510 Fall 2010 Course Schedule**  
See Moodle page for detailed schedule and assignments

Module	Date	Primary Topic	Reading	Homework
1	8/23	Intro, Syllabus, Measurements, Units		Ch 1: 8, 18, 25, 32
	8/24	<b>Lab 1:</b> Volume and Uncertainty	Lab Manual	
	8/25	Dimensional Analysis, Estimations	1.1 – 1.7	
	8/30	<b>Lab 2:</b> Using MS-Excel	Lab Manual	
2	8/31	<b>Lab 3:</b> Measuring Position	LM, 2.1 – 2.7	Ch 2: 13, 14, 34, 36, 53, 66
	9/1	Kinematics in One Dimension	2.8-2.10, 4.8	
	9/6	<b>Lab 4:</b> Acceleration of Gravity	Lab Manual	
	9/7	<b>Lab 5:</b> Peer Review	Lab Manual	
	9/8	Exam 1		
3	9/13	2D and 3D Kinematics	3.1-3.6, 4.1-4.3	Ch3: 28, 65 Ch4: 16, 34, 39,48, 63 Ch10: 3, 25, 28, 29
	9/14	<b>Lab 5:</b> Orienteering	Lab Manual	
	9/15	Projectile Motion	4.4-4.6, 4.9	
	9/20	2D and 3D Kinematics, Discussion		
	9/21	Kinematics of Rotation	4.7, 10.1-10.5	
	9/22	Exam 2		
4	9/27	Newton's Laws	5.1-5.8	Ch 5: 11, 37, 43, 58, 60 Ch 6: 29, 32, 40, 57
	9/28	Newton's 2 <sup>nd</sup> Law, Forces	5.9, 6.1-6.4	
	9/29	Newton's 2 <sup>nd</sup> Law, Discussion		
	10/4	Newton's 2 <sup>nd</sup> Law: Circular Motion	6.5	
	10/5	<b>Lab 6:</b> Friction	Lab Manual	
	10/6	Exam 3		
5	10/11	Torque, Newton's 2 <sup>nd</sup> Law for Rotation	3.8,10.7-10.9 11.1,11.2,11.4-11.6	Ch 10: 44, 52, 71 Ch 11: 24 Ch 12: 25, 37, 45
	10/12	<b>Lab 7:</b> Pendulums and Springs	Lab Manual	
	10/13	Mechanical Equilibrium, Statics	12.1-12.5	
	10/18	Dynamics of Rotation, Discussion		
	10/19	Elasticity / <b>Lab 8:</b> Young's Modulus	Lab Manual	
	10/20	Exam 4		
	10/25	<b>Lab 9:</b> Oral Presentations	Lab Manual	
6	10/26	Work and Energy, Conservation of Energy	7.1-7.9, 8.1-8.8	Ch7: 5,11,16,21 Ch8:27,30,40 Ch10: 78,103 Ch 11: 12
	10/27	Work and Energy, Discussion		
	11/1	Work and Energy in Rotational Motion	10.6,10.10,11.3	
	11/2	<b>Lab 10:</b> Energy Experiments	Lab Manual	
7	11/3	Conservation of Linear Momentum	9.1-9.5, 9.7, 9.8	Ch 9: 7, 15, 20, 30, 44, 57, 63, 71 Ch 11: 58, 59
	11/8	Collisions	9.6, 9.9-9.12	
	11/9	<b>Lab 11:</b> Ballistic Pendulum	Lab Manual	
	11/10	Conservation of Angular Momentum	11.7-11.11	
	11/15	Angular Momentum, Discussion		
8	11/16	Gravitation	13.1-13.8	Ch13:13,23,28, 35,40,55,65
	11/17	Exam 5		
9	11/22	Hydrostatics and Hydrodynamics	14.1-14.10	Ch 14: 19,21,29,38, 40,43,53,62
	11/23	Hydrostatics and Hydrodynamics, Discussion		
	<b>11/24</b>	<b>No Class – Thanksgiving</b>		
10	11/29	Oscillations	15.1-15.9	Ch 15: 19,22,33,52
	11/30	Oscillations, Discussion		
	12/1	Final Review		
	<b>12/6</b>	<b>FINAL EXAM (8:00 am – 10:00 am)</b>		