Syllabus for PHYS F211X FE1+FE2+FE3+FE4 – General Physics I
College of Natural Science and Mathematics
University of Alaska Fairbanks
Spring 2016 (1/14/2016 to 5/6/2016)

Course Information:	**PHYS F211X FE1+FE2+FE3+FE4** **CRN 34855+34856+34857+39359**
Title:	General Physics I – 4 credits (3+1)
Lectures:	Monday, Wednesday, and Friday from 17:50 to 18:50 in room 202 Reichardt (REIC) Building
Lab:	FE1: Tuesday from 14:15 to 17:15 in room 254 REIC FE2: Thursday from 14:15 to 17:15 in room 254 REIC FE3: Thursday from 18:00 to 21:00 in room 254 REIC FE4: Tuesday from 18:00 to 21:00 in room 254 REIC
Final exam:	Thursday, May 5, 17:45 to 19:45
Prerequisites:	Concurrent enrollment in MATH F252X; placement in ENGL F111X or higher; or permission of instructor. Recommended: One year of high school physics.

Instructor:	**Dr. Chris Fallen, Assistant Research Professor,** **Space Physics and Aeronomy Group, Geophysical Institute,**
Office:	Room 706A Elvey Building
Office Hours:	MW from 16:00 – 17:00 and TR from 13:00 – 14:00, or by appointment. Note that office hours may be cancelled without notice due to external commitments. *Please call or email before attending office hours or to schedule an appointment.*
Phone:	907-347-6255 (cell phone) 907-450-8687 (office phone)
Email:	ctfallen@alaska.edu

Required Texts (1):	*Physics for Scientists and Engineers, 3rd ed., Addison-Wesley* Knight, R. D. ISBN: 9780321740908

Outside Resources:

Blackboard:	http://classes.uaf.edu (Handouts, assignments, schedules, etc.)
	Calculators, tutorials, examples
HyperPhysics:	http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
Microsoft Mathematics:	http://www.microsoft.com/en-us/download/details.aspx?id=15702
Physics portal:	http://www.physics.org/
Supplemental texts:	*Fundamentals of Physics* by Halliday, Resnick, and Walker *Physics*, by Tipler

Course Description: Vectors, kinematics, Newton's Laws, momentum, work, energy, rotational motion, oscillations, waves, gravity and fluids. For engineering, mathematics and physical science majors.

Course Objectives: Develop logical approaches to solve quantitative physics problems
Develop physical intuition and how to apply it
Develop abilities to work as a team in a laboratory environment
Develop hypothesis building abilities
Develop abilities to collect and analyze data from physics experiments
Discover and explain relationships between science and society

Instructional Methods: In-class lectures, quizzes, homework assignments, laboratory experiments and reports, and student written/oral presentations are closely integrated. Class activities emphasize a hands-on approach to developing problem solving skills and physical intuition. The written and oral project/presentation will explore the relationship between science and society.

Grading weights: **(will use +/- grades)**

Quizzes or other in-class exercises	10%
Weekly homework assignments	15%
Project	10%
Lab participation and reports	15%*****
Midterm exam 1	15%
Midterm exam 2	15%
Final Exam	20%

Course Policies:

- *Attendance & active participation are required for **all** class lectures and laboratories.*
  - ***All labs and reports must be completed to earn a passing grade in lab.**
  - ***A passing grade in lab is required to earn a passing grade in the course.**
- Short quizzes or in-class exercises will be assigned regularly.
- Homework assignments will typically be assigned weekly and are due at the specified time.
- *Late assignments will generally not be accepted for credit without prior approval from the instructor.*
- You are free and encouraged to ask questions of others and learn from your friends or the Internet, but not to copy solutions. All work submitted by each student must be their own work except for designated group projects.
- The UAF student code of conduct applies to this course and plagiarism will not be tolerated. See review the UAF student code of conduct and plagiarism guide at the following links:
  - http://www.uaf.edu/catalog/current/academics/regs3.html#Student_Conduct
  - http://library.uaf.edu/ls101-plagiarism
- Two midterm exams and one final exam will be given during the term.
- UA email and Blackboard accounts are required to be active the first day of class.

Disabilities Services: The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. I will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodations to students with disabilities.

Note on the core natural science designator: PHYS F211X satisfies the Natural Science component of the UAF Core Curriculum. As such, this course will conform to the guidelines set by UAF Faculty Senate, excerpted below from
https://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/guidelines-for-core-desig/

> The goal of the Natural Science component of the Core Curriculum is to prepare students for lifelong learning in the natural sciences (biology, chemistry, earth science, physics). In order to achieve this goal, three objectives will be met:
>
> 1. Students will become familiar with the methods used for acquisition and expansion of scientific knowledge through laboratory/field exercises which deal with
>   a. data collection and analysis,
>   b. hypothesis building, and
>   c. experimentation.
> 2. Students will learn and use major concepts of natural science either by exploring in depth a single discipline or the conceptual relationship between at least two of the natural sciences. Although there are no well-defined criteria for identifying a "major concept" of natural science, the following are generally accepted examples: momentum and energy, electricity and magnetism, the atomic and nuclear nature of matter, equilibrium, the cellular basis of life, evolutionary theory, and plate tectonics.
> 3. Students will understand the relationships between science and society in terms of the historical context of modern science and the influence of science on contemporary issues. They will also study elements of public science policy and the methods by which it is developed.

Tentative Schedule

Week	Lab	Lab topic	Day	Date	Lecture	Lecture topic	Chapter	Notes
0	X	None	FRI	1/15/2016	1	Introduction, Concepts of motion	1	
1	1	Mathematics Review	MON	1/18/2016	X	No Lecture - UAF holiday	X	
			WED	1/20/2016	2	Concepts of Motion	1	
			FRI	1/22/2016	3	Concepts of Motion	1	Deadline for adding classes
2	2	Uncertainty analysis	MON	1/25/2016	4	One-dimensional kinematics	2	
			WED	1/27/2016	5	One-dimensional kinematics	2	
			FRI	1/29/2016	6	Vectors and coordinate systems	3	Deadline for penalty-free withdraw
3	3	Distance and velocity	MON	2/1/2016	7	Vectors and coordinate systems	3	**Project 1 Due**
			WED	2/3/2016	8	Two-dimensional kinematics	4	
			FRI	2/5/2016	9	Two-dimensional kinematics	4	
4	4	Acceleration and force	MON	2/8/2016	10	Force and motion	5	
			WED	2/10/2016	11	Force and motion	5	
			FRI	2/12/2016	12	Force and motion	5	Freshman progress reports due
5	**X**	**Recitation and Review**	MON	2/15/2016	13	One-dimensional dynamics	6	
			WED	2/17/2016	14	One-dimensional dynamics	6	
			FRI	**2/19/2016**	**15**	**Exam 1**	**1 - 5**	
6	5	Simple machines	MON	2/22/2016	16	Motion of interacting objects	7	
			WED	2/24/2016	17	Motion of interacting objects	7	
			FRI	2/26/2016	18	Motion of interacting objects	7	
7	6	Conservation of mechanical energy	MON	2/29/2016	19	Two-dimensional dynamics	8	
			WED	3/2/2016	20	Two-dimensional dynamics	8	
			FRI	3/4/2016	21	Two-dimensional dynamics	8	
8	7	Conservation of momentum	MON	3/7/2016	22	Impulse and momentum	9	
			WED	3/9/2016	23	Impulse and momentum	9	
			FRI	3/11/2016	24	Impulse and momentum	9	Deadline to withdraw with a 'W' grade
9	X	Spring Break	MON	3/14/2016	X	No Lecture - UAF holiday	X	
			WED	3/16/2016	X	No Lecture - UAF holiday	X	
			FRI	3/18/2016	X	No Lecture - UAF holiday	X	
10	8	Ballistic pendulum	MON	3/21/2016	25	Energy	10	**Project 2 due**
			WED	3/23/2016	26	Energy	10	
			FRI	3/25/2016	27	Work	11	
11	**X**	**Recitation and Review**	MON	3/28/2016	28	Work	11	**Project 2 discussion comments due**
			WED	3/30/2016	29	Work	11	
			FRI	**4/1/2016**	**30**	**Exam 2**	**6 - 10**	
12	9	Torque	MON	4/4/2016	31	Rotational motion	12	
			WED	4/6/2016	32	Rotational motion	12	
			FRI	4/8/2016	33	Rotational motion	12	
13	10	Harmonic motion and resonance	MON	4/11/2016	34	Gravity	13	
			WED	4/13/2016	35	Gravity	13	
			FRI	4/15/2016	36	Gravity	13	
14	11	The speed of sound in air	MON	4/18/2016	37	Oscillatory motion	14	
			WED	4/20/2016	38	Oscillatory motion	14	
			FRI	4/22/2016	X	No Lecture - UAF holiday	X	
15	**X**	**Make-up labs**	MON	4/25/2016	39	Fluids	15	**Project 3 due**
			WED	4/27/2016	40	Fluids	15	
			FRI	4/29/2016	41	Waves	20	
16			MON	5/2/2016	42	Waves	20	**Project 3 discussion comments due**
	Final Exams		**THU**	**5/5/2016**		**Final Exam Thursday 17:45 to 19:45 AKDT**		