# Dynamical Systems
## Physics 2513 Fall 2015
## Syllabus

**Time**: MWF 10:00 am - 10:50 am
**Place**: Allen Hall 105
**Instructor**: Dr. Brian Batell
**Office** : Allen Hall 401
**Email** : batell@pitt.edu

**Text**: *Theoretical Mechanics of Particles and Continua*, A. L. Fetter and J. D. Walecka

**Office Hours**: 2:30 pm - 4:00 pm on Monday and Thursday. I strongly encourage you to take advantage of office hours. If the scheduled office hours do not fit within your schedule for any reason, please email me to set up an appointment to meet outside of these times.

**Learning Objectives**: Develop an understanding and appreciation for the basic principles of classical mechanics, including Newton's Laws of Motion, Conservation Laws, and the Lagrangian and Hamiltonian formalisms. Be able to apply the basic principles to a diverse set of physical systems in order to describe and understand a variety of classical phenomena. Develop general problem solving skills and analysis tools, including mathematical and numerical methods.

**Course Description**: Overview of basic principles including Newton's Laws and the Lagrangian and Hamiltonian formulations of classical mechanics. Additional topics will include conservation theorems, small oscillations, rigid-body motion, canonical transformations, classical field theory, Noether's theorem, continuum phenomena and fluid dynamics.

**Class Participation**: Students are expected to attend and participate in class. Each class will involve a mix of lecture, discussion, and one or more student activities. Participation credit will be awarded for these activities.

**Homework**: Homework will generally be assigned each week on Friday and due the following Friday at the beginning of class. Homework will be graded and solutions to the homework will be made available after all students have turned in the assignment. Late assignments will be accepted if turned in no later than one week after the original due date and will be awarded 75% of the total credit. If there are outstanding circumstances that prevent you from completing the assignment on time, please see me to discuss the matter. I strongly encourage you to discuss the homework problems with your classmates. However, each student must write their own solutions to the homework problems.

**Exams**: There will be one mid-term exam and one final comprehensive exam during the semester.

**Grading**: The final letter grade will be awarded according to the weighted credit for class participation (15%), homework (25%), mid-term exam (20%), and final exam (40%) and will be based on the following scale:

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| 90-100% | $A^+$ | 75-80% | $B^+$ | 60-65% | $C^+$ | 45-50% | $D^+$ | | |
| 85-90% | A | 70-75% | B | 55-60% | C | 40-45% | D | <35% | F |
| 80-85% | $A^-$ | 65-70% | $B^-$ | 50-55% | $C^-$ | 35-40% | $D^-$ | | |

**Academic Integrity**: All students are expected to adhere to the standards of academic honesty. Any student engaged in cheating, plagiarism, or other acts of academic dishonesty would be subject to disciplinary action. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to the confiscation of the examination of any individual suspected of violating the University Policy.

**Disability Services**: If you have a disability, contact both your instructor and the Office of Disability Resources and Services (DRS), 216 William Pitt Union, 412-648-7890/412-383-7355 (TTY) as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

**Statement On Classroom Recording**: To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the students own private use.

**If you have any questions about the course, please feel free to contact me.**