

## Course Syllabus

### PHY113: Physics of Sports

- Week 1: Introduction/Orientation  
Length, Mass and Time: The Basic Units
- Week 2: Average speed, Velocity, and Acceleration  
(Auto/bicycle racing, Marathon, Sprint...)  
Gravity and Falling Bodies w/o air resistance  
(Jumping, Diving, Sky Diving...)
- Week 3/4: Vectors and Projectile Motion:  
Two-dimensional problems w/o air resistance  
(Baseball, Football, Basketball throwing...)
- Week 4/5: Force; Newton's Laws of Motion  
(Concussion in Football and Boxing...)
- Week 5: Midterm Exam 1
- Week 6: Friction (Skiing, Skating...)
- Week 7: Momentum Conservation, Collisions and Impact  
(Football, Auto racing, Auto accident, Tennis, Baseball batting...)
- Week 8: Torque and Rotation (Football blocking and tackling)
- Week 8: Rotational Motion Centripetal Force  
(Bicycle and Auto racing, Figure skating...)
- Week 9: Angular Momentum Conservation  
(Football throwing, Figure skating, Diving, Gymnastics...)
- Week 10: Work, Energy, Power (Baseball pitching, Diving...)  
Midterm Exam II
- Week 11: Temperature and Heat; Heat loss by conduction and radiation  
(Uniforms, Heat exhaustion)  
Elasticity (Bungee Jumping)
- Week 12: Fluids and Pressure; Bernoulli's Effect  
(Scuba diving, Hang Gliding, Sailing)
- Week 13: Air and Fluid Resistance, Drag force, Terminal speed  
(Sky diving, Auto racing)
- Week 14: Magnus Force  
(Baseball Pitching: Curve ball, Slider, Knuckle ball, Sinker, Cut fast ball; Football throwing and kicking; Volleyball hitting, Spins in Tennis, Ping-Pong and Soccer)

Textbook (recommended but not required):

P. P. Urone, "Physics with Health Science Applications", Wiley  
(This book does not contain a discussion of momentum.)

## ACADEMIC INTEGRITY SYLLABUS STATEMENT

*Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>*  
- Adopted by the Undergraduate Council September 12, 2006

Statement regarding the instructor's responsibility to report behavior that interrupts the learning process, inhibits instructor's ability to perform his/her duties, or compromises the safety of other students:

*Stony Brook University expects students to maintain standards of personal integrity that are in harmony with the educational goals of the institution; to observe national, state, and local laws and University regulations; and to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, and/or inhibits students' ability to learn.*