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***Textbook*:** Halliday, Resnick and Walker. ***Principles of Physics*,** 10th edition, international student version.
***Online Course*:** https://itc.birzeit.edu/

Introduction:

Physics 141 is the first course of introductory calculus-based physics courses at Birzeit University. This course is all about the motion whether translation, rotation or vibration of point particles and rigid bodies. It begins by introducing measurements, and moves on to discuss motion of particles in a straight line, then exposed kinematics in two- and three-dimensions. This is followed by a presentation of the set of laws known as Newton's laws of motion with many applications. The concepts of work, power and energy are then introduced followed by gravity. Momentum and energy are then introduced and applied in solving important dynamical problems. The basic principles and techniques used in translational motion will finally be applied to rotational and vibrational motions.

Learning Outcomes:

At the conclusion of this course, students should be able to
- Relate everyday observations of the physical world to the basic laws and principles of physics.
- Gain a deep understanding of roles that our knowledge of physics has played in the development of civilization in general and that of the technology in particular.
- Describe quantitatively motion of a mechanical system and relate it to the underlying forces.
- Apply the concepts of work, energy, momentum, and conservation laws to explain physical phenomena.

Course Regulations:

The class will meet three times a week; two meetings (T, R) are assigned as lectures and the other one is a discussion. In the lecture, the teacher may not be interrupted by questions. However, the lecturer will sometimes allow for some questions at special times. In the discussion meetings, students should come prepared with questions and comments. Students should also make use of their instructor's office hours to discuss problems.

Quizzes

Quizzes are short exams that will be administered in the discussion session. Whenever a chapter has been discussed in class, you should expect a quiz on it the next session.

Grade Distribution:

Discussion quizzes	20
First Hour Exam	20
Second Hour Exam	20
Final Exam	40
Total	**100**

Course Syllabus:

Chapter	Title	# of lectures	Lecture Problems	Discussion Problems
1	Measurement	1	9, 22	3, 7, 12, 28
2	Motion along a straight line	2	2, 5, 14, 21, 39, 45	3, 15, 23, 33, 43, 47, 69
3	Vectors	2	3, 9, 12, 23, 36, 41	1, 7, 15, 32, 35, 44
4	Motion in 2 and 3 dim.	3	7, 14, 22, 32, 58, 60, 80	5, 11, 15, 20, 27, 56, 67, 77
5	Force and motion I	1.5	7, 14, 34, 43, 58	1, 10, 15, 35, 45, 51, 59
	First Hour Exam			
6	Force and motion II	1.5	10, 20, 28, 33, 43	9, 19, 21, 25, 39,42, 53
7	Kinetic Energy and Work	2	8, 11, 26, 37, 42	5, 9, 17, 35, 41, 46
8	Potential energy and Conservation of Energy	2	5, 20, 24, 31, 38	2, 6, 23, 26, 34, 60, 65
9	Center of mass and linear momentum	3	2, 5, 13, 22, 35, 62, 64	1, 4, 12, 17, 37,46, 59, 68, 76
	Second Hour Exam			
10	Rotation	3	2, 8, 16, 32, 41, 51, 57	1, 4, 12, 25, 34, 45, 52, 66
11	Rolling, torque and Angular momentum	2	4, 9, 23, 37, 52	3, 6, 12, 27, 41,57
15	Oscillations	3	5, 13, 32, 39, 50	4, 28, 34, 38