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Project Title: Modernization of Teaching Methodologies in Higher Education: Eu Experience For Jordan And Palestinian Territory

Project acronym: METHODS

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Start date of the project: 15/10/2015 **Duration:** 42 months

Deliverable title	**Course Outline**
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WP Number	**5**
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Birzeit University

Engineering and Technology

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Course title/code	Physics 1	PHYS141
Instructor /office	Dr. Aziz Shawabkeh	TEC117
Semester- Year	Second Semester 2018/2019	
Compulsory/Elective	Compulsory	
Prerequisites		

Course Description	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. .

Generic Competences*	• 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.
Specific Competences (SCs)	1. An ability to apply knowledge of mathematics, and physics (**A**). 2. An ability to analyze quantitative motion of a mechanical system and relate it to the underlying forces (**B**). 3. An ability to apply the concepts of work, energy, momentum, and conservation laws to explain physical phenomena (**C)**

- These competences related also to the project Methods
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	Course contents	SC1	SC2	SC3
1	Measurements	X	X	
2	Motion along a straight line		X	
3	3 Vectors		X	X
4	Motion in 2 and 3 dimensions	X		X
5	Force and motion I			
6	6 Force and motion II			X
7	Kinetic Energy and Work			
8	Potential Energy & Conservation of Energy			
9	Center of mass & Linear Momentum			X
10	Rotation			
11	Rolling, Torque and Angular Momentum			
12	Oscillations			
13				

Schedule				
Week	**Subject**	**Activity Description ***	**Evaluation Criterion**	
			Description	**%**
1	Measurements	Students work on groups to discuss different types of measurement systems and how they are used in our daily life	Every group should develop a presentation about measurement systems and its history and the importance of them	5
2	Motion along a straight line	Students should watch a short video before class about motion	Students work in groups to develop a system that uses motion in straight line	5
4,5	Vectors	Students should watch a short video before class about vectors	A quiz in the topic is conducted, then solved by the students in groups. Open discussion about the topic is raised and the concept of flipped classroom is introduced	5
5	Motion in 2 and 3 dimensions	Students should watch a short video before class about in 2 and 3 dimension	Discussing the problem to be adopted in the semester, explaining the main	10

			component of project, milestones, groups, etc.	
6	Force and motion I	Students should watch a short video before class about Force and motion	Quiz is given to students in groups to work in solving a problem in force and motion and then present it in front of students	5
7	Force and motion II	Students should watch a short video before class about Force and motion	A quiz in the topic is conducted, then solved by the students in groups. Open discussion about the topic is raised and the concept of flipped classroom is introduced	10
8,9	Kinetic Energy and Work	Topic in kinetic energy will be discussed and the concept of work in daily life.	Discussing the problem to be adopted in the semester, explaining the main component of project, milestones, groups, etc.	5
10	Potential Energy & Conservation of Energy	Students should watch a short video before class about potential energy	A quiz in the topic is conducted, then solved by the students in groups. Open discussion about the topic is raised and the concept of flipped classroom is introduced	10
11,12	Center of mass & Linear Momentum	Discussion of Center of mass and linear motion in front of students	Group work in how center mass and linear momentum exist in many machines around us. Students should select a machine and analyze it and present it in front of students.	10
13	Rotation	Students should watch a short video before class about rotation	Group work in how rotation exist in many machines around us. Students should select a machine and analyze it and present it in front of students	10
14,15	Rolling, Torque and Angular Momentum	Students should watch a short video before class about Rolling, Torque and Angular Momentum	A quiz in the topic is conducted, then solved by the students in groups. Open discussion about the	10

			topic is raised and the concept of flipped classroom is introduced	
16	Oscillations	Prototypes on different oscillations by providing different set ups to students to practice in class	Write a report in groups about the observations for every setup they watched and present in front of students	10

* Activities mentioned above are implemented based on BPL mixed with flipped classroom

Textbook and References	**Textbook** Halliday, Resnick and Walker. *PRINCIPLES of PHYSICS*, 10th ed.	
Overall Assessment Criteria	**Method**	**Weight** [%]
	Quizzes	20
	Two Hour Exams Exam	30
	Project	10
	Final Exam	40