

## PHYS S7Z03: Physics Through PBL 1

Module Details	
Module Code:	PHYS S7Z03
Full Title:	Physics Through PBL 1 <b>APPROVED</b>
Valid From::	Semester 1 - 2019/20 ( June 2019 )
Language of Instruction:	
Duration:	1 Semester
Credits::	5
Module Owner::	Tony Lennon
Departments:	Unknown
Module Description:	<ul style="list-style-type: none"><li>• Knowledge of physics is fundamental to the understanding of all scientific concepts and principles. It is therefore a necessary part of any scientific program that aims to inculcate the basic principle underlining scientific observation and measurement. The physics taught here (mechanics, electricity and radioactivity) is the foundation upon which other concepts later in the programme are built.</li><li>• Equally as important as the physics taught is the method of teaching which is Problem Based Learning. PBL encourages deep learning and the development of professional skills such as self motivation, group learning, team working, leadership skills, presentation skills, self esteem, and self confidence.</li></ul>

Module Learning Outcome	
On successful completion of this module the learner will be able to:	
#	Module Learning Outcome Description
MLO1	Contribute to problem solving as a member of a group (Process Skill).
MLO2	Learn through self-directed learning and Self assess their learning process (Process Skill).
MLO3	Explain how the principles of mechanics can be used to perform calculations relating to mechanics (Product Content).
MLO4	Explain how the principles of electricity can be used to perform calculations relating to electricity as well as explaining Radioactivity (Product Content).
MLO5	Perform experiments using mechanical and electrical instruments and write scientific reports (Product Content).
Pre-requisite learning	
<b>Module Recommendations</b> <i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named DkIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i>	
No recommendations listed	

Module Indicative Content
<b>Mechanics</b> S.I. system of units; kinetics; force, mass and weight; work, energy and power; momentum; circular motion.
<b>Properties of Matter</b> Density; flotation; pressure (in liquids and gases); fluid flow
<b>Electricity</b> Electrostatic concepts; D.C. circuits, energy and power; magnets; magnetic forces; motors; electromagnetic induction, generators and transformers, A.C. and D.C. electricity; electro-chemistry.
<b>Radioactivity</b> Nuclear Radiation, Radioactive Isotopes, Penetration of Radiation
<b>Group Marking:Phase 1: Product mark:</b> • Each member of the group receives the same mark prorated by attendance. • No process mark is allocated.
<b>Group Marking:Phase 2: Product and process mark:</b> • Each member of the group receives the same Product mark prorated by attendance. • Individual process marks are awarded by the lecturer and agreed with each student.
<b>Group Marking:Phase 3: Peer Assessment:</b> • The total mark for the group is determined and prorated by attendance. The students then allocate these marks between the group members. This division is done either, preferably by discussion within the group, or by voting.
<b>Group Marking and Semesters</b> • Semester 1 usually uses Phase 1 & 2 marking. • Semester 2 usually uses Phase 3 marking.
<b>Problem and Tutorial Weighting</b> • In addition to the PBL problems each student normally submits at least 2 tutorial sheets for assessment each semester. Also there will be a Moodle Quiz in semester 1. • Each PBL problem, tutorial sheet and quiz has the same weighting.
<b>Students group allocation</b> The students are allocated into groups and the groups are changed after each member has been chair of the group. The balance of the groups and hence the group dynamic are controlled by the lecturers
<b>Learning and Teaching Methods</b> There will be 2 two-hour Problem-Based Learning (PBL) sessions per week. The students are divided into groups of about 5, and each group works co-operatively and in a structured way to solve each of a series of about 15 problems. (Each problem will take usually 1 to 2 sessions to solve). Each group then presents a report or audiovisual presentation, which forms the basis for continuous assessment. The problems are designed so that practical work is an integral part where appropriate. Occasional tutorials will be used to reinforce the Curriculum Objectives covered in problems. Technology enhanced supports have been added through the generation of twelve screen-casts. These videos have been recorded for each tutorial and one for the spectrometer set up. They are available on Moodle with 24/7 access. These videos will facilitate our international students and will be a good resource for revision for all our students.

Module Assessment	
Assessment Breakdown	%
Course Work	100.00%
Module Special Regulation	

## Assessments

Full Time On Campus			
Course Work			
Assessment Type	Written Report	% of Total Mark	100
Marks Out Of	0	Pass Mark	0
Timing	Every Week	Learning Outcome	1,2,3,4,5
Duration in minutes	0		
<b>Assessment Description</b> 1/ Continuous Assessment will be based on the problem reports. The mark for each student being derived from a combination of tutor, peer and self assessment. There are approximately 15 PBL problems. 2/ There are typically 2 - 3 coursework exercises and one Moodle quiz. 3/ All coursework elements carry the same weighting.			
No Project			
No Practical			
No Final Examination			
Reassessment Requirement			
<b>Reattendance</b> The assessment of this module is inextricably linked to the delivery. Therefore reassessment on this module will require the student to reattend (i.e. retake) the module in its entirety.			

## Module Workload

Workload: Full Time On Campus					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Practical	Contact	PBL Problem Session	Every Week	4.00	4
Independent Study	Non Contact	Directed Reading and Group work outside Lab.	Every Week	5.00	5
				Total Weekly Learner Workload	9.00
				Total Weekly Contact Hours	4.00
This module has no Part Time On Campus workload.					

## Module Resources

### Supplementary Book Resources

Duncan, Tom. (2005), Physics for Today and Tomorrow Second Ed., John Murray, London.

Duncan, Tom. (2000), Advanced Physics, Fifth Ed., Hodder, London.

Duncan, T. and Kennett, H.. (2001), GCSE Physics, Hodder, London.

Breithaupt, Jim. (2010), Physics, Third Ed., Palgrave Macmillan, London.

Nuffield Advanced Science. (2004), Book of Data, Longman, UK.

Casserty, B. and Horgan, B. (2000), Physics Now, Gill & Macmillan, Dublin.

O'Regan, Dan. (2000), Real World Physics, Folens, Dublin.

Johnson, Keith. (2006), Physics for you, Hutchinson Education, England.

Nelson, M.. (2005), Principles of Physics, Eighth Ed., Longman, England.

Gov. Pub.. Mathematical Tables, Dublin.

Grant, I. S. and Phillips, W. R.. (2001), The Elements of Physics, Oxford University Press, Oxford.

Henly, Randal. (2000), Physics Today, C J Fallon, Dublin.

Knight, Randal. (2016), Physics for Scientists and Engineers, International ed., Pearson, San Francisco, [ISBN: 1292157429].

Knight, Randal. (2008), Physics for Scientists and Engineers, Student Workbook, Pearson, San Francisco.

Bloomfield, Louis. (2009), How Things Work, Fourth Ed., Wiley, New York.

Ball, Moore and Turner. (2008), Essential Physics for Radiographers, Fourth Ed., Blackwell, UK.

Geller, E. et al.. (2003), Dictionary of Physics, Third Ed., McGraw-Hill, NY.

Kenny, Andrew. (2010), Investigating Physics, Gill & Macmillan, Dublin, [ISBN: 978071745881].

Halliday, Resnick, Walker. (2014), Principles of physics, 10th. Wiley.

*This module does not have any article/paper resources*

### Other Resources

Website, Fear of Physics website,  
<http://www.fearofphysics.com>

Website, Physics website in Ireland,  
<http://www.physics.slss.ie>

Website, Cern Website,  
<http://www.public.web.cern.ch/public>

Website, Walter Fendt website,  
<http://www.walter-fendt.de/ph14e>

Website, Teaching Physics - Inst of Physics Website,  
<http://www.teachingphysics.iop.org>

Website, Physics website,  
<http://www.physics.org>

Video, Tony Lennon. (2017), Video 0 - Report Writing, DkIT, Tony Lennon.

Video, Tony Lennon. (2017), Videos 1- 4 for Tutorials 1 - 4, DkIT, Tony Lennon.