

Professional Diploma in Teaching Physics (PDITP)

Eilish McLoughlin (DCU)



I. PDITP Programme Team

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II. Programme Objectives:

PDITP is designed to upskill post-primary teachers to meet current Teaching Council subject requirements in Physics at the highest level.

Participants will:

- Acquire the theoretical and experimental knowledge of physics as well as pedagogical content knowledge that is necessary for effective physics teaching at post-primary level;
- Demonstrate an ability to connect physics content modules and the school physics curriculum;
- Develop a high standard of practical competence in physics teaching as reflective practitioners during their programme of study.

II. Programme Requirements

*Professional Diploma Level 8
75 ECTS part-time*

General Entry Requirements:

Applicants will have:

- An honours undergraduate degree at level 8 on the National Framework of Qualifications (NFQ), or equivalent.
- Minimum H4 in Leaving Certificate Mathematics (or equivalent) or 5 ECTS credits in mathematics at NFQ level 6 or above.
- Full current registration as a post-primary teacher with the Teaching Council for Education Sector = Route 2 Post Primary.

<https://www.dcu.ie/courses/postgraduate/school-physical-sciences/professional-diploma-teaching-physics>

III. PDITP Programme Structure

Academic year	Semester	Module Code	Module Title	60 ECTS
2020/21	Spring	PS470G	Mechanics (NUIG)	5
	Spring	PS471L	Waves/Light/Modern Physics (UL)	5
	Spring	PS472	Thermal Physics & Physics laboratory 1 (DCU)	7.5
2021/22	Autumn	PS475G	Electricity (NUIG)	5
	Autumn	PS476L	Modern Physics (UL)	5
	Year long	PS482	Physics Laboratory 2 (DCU)	5
	Spring	PS477G	Environmental Physics (NUIG)	5
	Spring	PS478L	Semiconductor Devices (UL)	5
	Spring	PS481	Life, the Universe and everything (DCU)	5
2022/23	Autumn	PS479G	Electricity and Magnetism (NUIG)	5
	Autumn	PS480L	Optics (UL)	5
	Autumn	PS483	Physics Laboratory 3 (DCU)	2.5

Pedagogy Modules	15
Summer School 1: Pedagogy and Research in Physics Education (UL)	5
Summer School 2: Practitioner Inquiry in Physics Education 1 (DCU)	5
<i>Teachers conduct their Practitioner Inquiry in their School</i>	
Summer School 3: Practitioner Inquiry in Physics Education 2 (DCU)	5
<i>Teachers submit their portfolio for their Practitioner Inquiry</i>	

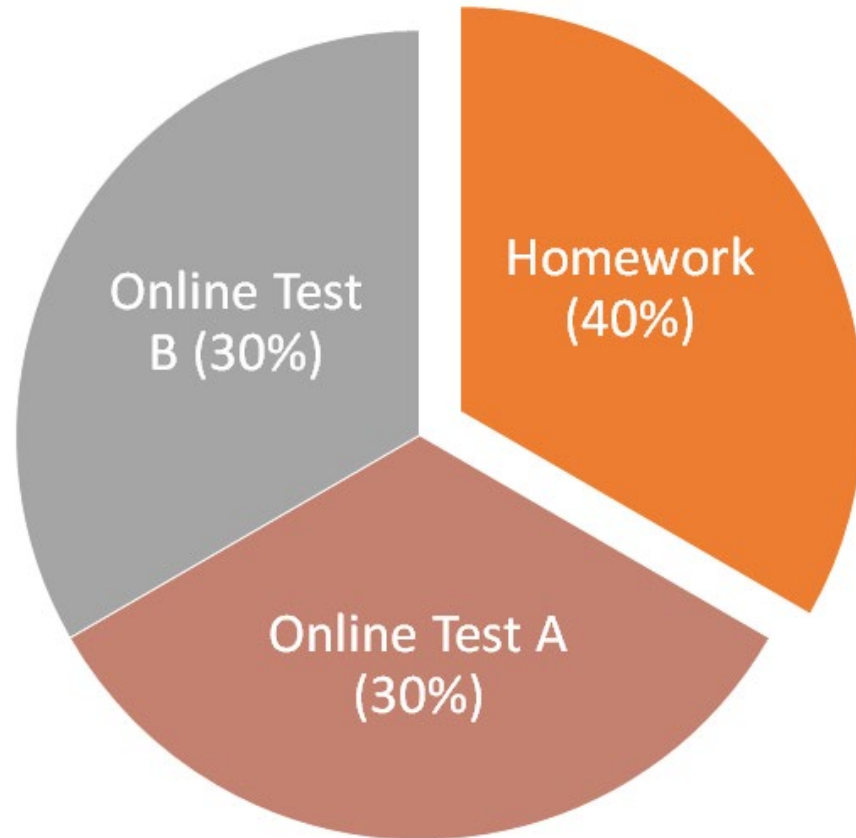
IV. PDITP Timeline 2020/21

20 October 2020	Letter of Award for PDITP programme
04 November 2020	Programme launched by Minister Foley and Minister Harris
18 November 2020	Programme approved by DCU Education Committee
04 December 2020	Application system opened on DCU recruitment portal
04 January 2021	Application deadline
07 January 2021	Offers made to 25 candidates
19 January 2021	Induction meeting with 25 candidates
25 January 2021	Start of PDITP Programme

V. PDITP Modules 2021/21

PS470G	Mechanics	<ul style="list-style-type: none"> •24 hours pre-recorded lectures •24 synchronous online sessions •24 hours Tutorial support (WebWorks) 	Mondays 6pm-9pm
PS471L	Waves/Light/Modern Physics	<ul style="list-style-type: none"> •24 hours pre-recorded lectures •24 synchronous online sessions •24 hours Tutorial support (Loop VLE) 	Wednesdays 6pm-8pm
PS472	Thermal Physics	<ul style="list-style-type: none"> •24 hours pre-recorded lectures •24 synchronous online sessions •24 hours Tutorial Support (Mastering Physics) 	Mondays 6pm-9pm
	Physics Laboratory 1	<ul style="list-style-type: none"> • 18 hours labs (remote) 	3 days over Easter
PS473L	Pedagogy and Research in Physics Education	4 days summer school with a follow-up day in August (online)	8th-11th June 2021
PS474	Practitioner Inquiry in Physics Education 1	5 days summer school (online)	14th -18th June 2021

VI. Physics Module Assessment



Assessment are based on 100% continuous assessment
i.e. No end of module formal examinations

Conducted using:

- Webworks
- Mastering Physics
- Online Exams
- Video Presentations

VII. Pedagogy & Research in Physics Education

Tuesday 8th June	Wednesday 9th June	Thursday 10 th June	Friday 11 th June
<p>Physics Pedagogy, why and what? Gráinne Walshe (UL)</p>	<p>Literature Review and referencing Sue Millar, DCU Library</p>	<p>ICT, digital technologies in physics education Stephen Comiskey (UL)</p>	<p>Planning Units of Learning in Physics Deirdre O'Neill & Gráinne Walshe (UL)</p>
<p>Equity and Inclusion in Physics Learning and Teaching Eilish McLoughlin (DCU)</p>	<p>Hooking Students into Physics: Triggers towards Sustaining Student Interest <i>Veronica McCauley & Kevin Davison (NUIG)</i></p>	<p>Physics Education Research: What the Research says about Teaching Physics <i>Gráinne Walshe (UL)</i></p>	<p>Preparing for the Unit of Learning Assignment <i>Gráinne Walshe (UL)</i></p>
<p>Planning a physics curriculum <i>Gráinne Walshe (UL)</i></p>	<p>Social Scientific Issues and Argumentation in Physics <i>Deirdre O'Neill & Gráinne Walshe (UL)</i></p>	<p>The Physics Teacher's Toolbox <i>David Keenahan & Paul Nugent (IOP)</i></p>	<p>Preparing for the Literature Review Assignment <i>Lawrence Cleary, UL Regional Writing Centre</i></p>

VII. Pedagogy & Research in Physics Education Assessment

Physics Education Research Project (60%)

Teachers will design a physics education research project and conduct a mini-literature review on a topic of their choosing, forming the basis of their practitioner inquiry in Year 2 for their second pedagogy module

Individual literature review due by Aug 15th.

Unit of Learning (40%)

Teachers will develop a unit of learning with lesson plans incorporating the pedagogical strategies, creative activity-based learning approaches and a variety of modes of assessment to support diverse learners in their classroom.

Group presentation (two per group) on the unit of learning to be scheduled in August 2021.

VIII. Practitioner Inquiry in Physics Education

	Monday 14 th June	Tuesday 15 th June	Wednesday 16 th June	Thursday 17 th June	Friday 18 th June
9:30-11:00	Module Overview	PLC Activity	IBL Activity	PLC Activity	IBL Activity
	Introduction to Inquiry Based Learning (IBL)	Reflection on IBL, PI, PLC	PI: Types of Data	PI Activity	Reflection on IBL, PI, PLC
11:30-13:00	Introduction to Professional Learning Communities (PLCS)	IBL Activity	PI Activity	IBL Activity	Sharing of PI
	IBL Activity				
14:00-16:00	Introduction to Practitioner Inquiry (PI)	PI Activity	Reflection on PI	Reflection on PI	Next Steps, Timelines, Q&A
	Preparing a PI	Preparing a PI	Reflection on IBL, PI, PLC		

IX. Practitioner Inquiry in Physics Education Professional Portfolio

A1 - Teacher Reflections (30%)

Teachers will demonstrate their **understanding of inquiry based learning, practitioner inquiry and professional learning communities.**

- Drawing on evidences (from the workshop activities) of understanding of IBL, PI, PLC

Assessment Due: 10th of August

A2- Inquiry Brief for Practitioner Inquiry (70%)

Teachers will submit their Inquiry Question and Plan (Inquiry Brief)

- Including a review of selected literature linked to their chosen inquiry

Assessment Due: 10th of August

X. PDITP Challenges and Opportunities

- Preparation of Programme Documentation for DCU Accreditation Process.
- Preparation of Memorandum of Agreement in liaison with units/schools from DCU/UL/NUIG.
- Design of lectures, homework, tutorial and assessment materials for each module.
- Delivery of remote physics Laboratories and summer schools.
- Heavy workload for teachers over a 15 week semester (~15-20 hours/week).
- School closures January – April 2021
- Staff Recruitment
- High number of disappointed applicants.
- Many candidates excluded from offers as places prioritised for those taking the full Award.
- Teachers supported to develop their Content Knowledge for Teaching Physics at Junior Cycle/Senior Cycle.
- Teachers collaborate as part of a Professional Learning Community to carry out and reflect on their own Practitioner Inquiry.
- Design and evaluation of model for Physics teacher Professional Learning.

Thank you for your attention.

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