



University
of Glasgow | School of Physics
& Astronomy

Physics Education & Communication (PHYS4034)

Course Information Guide 2023-24

The Physics Education & Communication (PE&C) course is an elective course for students on Single Honours degrees, normally taken in year 4, though it may be possible to take in year 5 for MSci students. It is intended for students considering a career in teaching, or simply interested in broadening their skills-base. The course sees students undertake placements within local Secondary Schools, working in Physics classes at all levels.

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1 Welcome statement from Head of School

As the Head of School of Physics and Astronomy, I would like to welcome you to your new class. The School prides itself in providing an excellent and supportive learning and teaching environment that is fully integrated with our research; you will have the opportunity to interact with world-leading researchers working at the cutting edge of a wide range of fields of physics and astronomy, who are tackling some of the biggest contemporary challenges in science and technology.

Having said that, this year is going to be “interesting” to say the least, due to the uncertainties caused by the coronavirus pandemic. We will all be in learning mode this year. Staff will be undertaking a great deal of work in preparing teaching materials to be used in a blended learning approach that is flexible enough to work in different scenarios. We are confident that the current challenges present us with opportunities to re-evaluate and improve how we learn and teach, and for this you will play a critical role. I ask that you not only bear with us in these extraordinary circumstances, but engage with us through any of the available communication channels in letting us know what works and what does not.

One thing that will not change is the School’s firm commitment to supporting equally the careers and development of all its students and staff, as exemplified by our receipt of an Athena Swan Silver award. We value the diversity of our student body and recognise that this diversity improves the quality of our work by bringing a wide range of skills and viewpoints. We therefore expect that all staff and students will work productively and professionally together in an atmosphere of mutual respect.

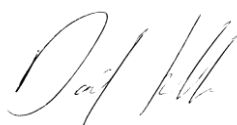
To support this, all our staff and graduate students undertake equality and diversity training, our lab guides include a code of conduct for students, supplementing the University code¹, and we support the University's Dignity at Work and Study policy². You can be assured that any instances of bullying, harassment, or offensive language or behaviour will be both taken seriously by the School and treated with sensitivity. Points of support for students are your adviser of studies, your Class Head and Lab Head, and in addition the School has two appointed Equality and Diversity offices, to whom students may speak in confidence.

I wish you success with your current and future studies.

¹ <https://www.gla.ac.uk/myglasgow/senateoffice/studentcodes/studentconductstaff/>

² <https://www.gla.ac.uk/myglasgow/humanresources/equalitydiversity/dignityworkstudyover/>

Best wishes



Professor David Ireland
Head of School

2 General Information and Introduction

The Physics Education & Communication (PE&C) course is an elective course for students on Single Honours degrees, normally taken in year 4, though it may be possible to take in year 5 for MSci students. It is intended for students considering a career in teaching, or simply interested in broadening their skills-base. The course sees students undertake placements within local Secondary Schools, working in Physics classes at all levels.

The exact work a student carries out during their placements will be set in agreement between the student, the teacher and the course co-ordinator at the School of Physics & Astronomy. The student is there to assist the teacher, and to learn about the teaching of physics.

As part of their work, the student will carry out a project. The content of this project will, again, be determined through discussion between the student and teacher and the student's own assessment of what will interest the particular pupils he/she working with. Typical examples might include:

- Assisting with the teaching of one specific element of the school physics curriculum – e.g. the electromagnetic spectrum; Newton's laws of motion; reflection and refraction of light; solids, liquids and gases.
- Description, in a manner accessible to an intelligent lay person, of an aspect of current research within the School of Physics and Astronomy (e.g. the Large Hadron Collider, gravitational waves, solar flares, laser holograms, electron microscopy) explaining how the underpinning physics relates to the School curriculum.

Over the course of Semester 1 the student will be required to demonstrate that they can analyse a specific teaching problem (i.e. how to explain a particular physics principle or phenomenon) and devise and prepare appropriately targeted teaching material (e.g. practical demonstrations) and basic 'tests' to illustrate it.

There is no formal examination for this course. Assessment is by means of work carried out through the year. Full details can be found in Section 3.3.

2.1 Communication

All information about the class will be communicated via the PE&C Moodle site, or by direct emails to students from the course organiser. **You will automatically be registered for access to the P1 Moodle site..**

2.2 Contacts

Course Organiser:	Dr Peter H. Sneddon Room 251a, Kelvin Building, Tel 0141 330 5312 Email: peter.sneddon@glasgow.ac.uk
Course Deputy:	Dr Sarah Croke Room 527, Kelvin Building, Tel 0141 330 4717 Email: sarah.croke@glasgow.ac.uk
PVG matters:	Miss Emma-Jane Gault Tel 0141 330 5519/0141 232 1819 Email: EmmaJane.Gault@glasgow.ac.uk

Students will work in close contact with a specified teacher in the school where their placement will take place. Contact details for each student will be provided at the beginning of the academic year.

2.3 Course availability

The course is open to students on the following degrees, either at MSci or BSc Hons:

- Physics
- Theoretical Physics
- Physics with Astrophysics

The course is normally taken in year 4 of a student's degree. It may be possible to take the course in year 5, however priority for places is given to students in their 4th year.

The course is also available to students on Combined MSci degrees, but only in 5th year. Such students should make sure they have space for this course in their curriculum before

applying – remember, you need 120 M level credits by the end of 5th year, and this course only carried H credits.

To gain a place on the course, students submit their names to the course organiser during their 3rd year. There is then an interview for each student, after which successful candidates are informed before the end of their 3rd year. Placements then begin as early in 4th (or 5th) year as possible.

All students offered a place on the course are required to apply for and obtain PVG clearance. This is a government requirement, and all costs are covered by the School of Physics & Astronomy. PVG forms will normally be completed and submitted before the end of 3rd (or 4th) year to allow placements to begin early in 4th (or 5th) year.

3 Course details

3.1 Intended Learning Outcomes

The broad aims of the course are:

- To provide Honours Physics students with the opportunity to gain academic credit by working as teaching assistants and acting as role models in local secondary schools;
- To encourage students to consider teaching as a career choice, whilst equipping students with valuable transferable skills developed in the classroom;
- To provide teachers with a knowledgeable and enthusiastic assistant who is able to offer practical help and engage pupils in physics;
- To provide UoG with the opportunity to build stronger links with local schools and teaching staff, thus potentially boosting long-term recruitment into STEM subjects.

3.2 Typical course timetable

There are no scheduled lectures for this course. There will be one, pre-course, meeting held in mid-September to introduce the course formally to the students and to begin the administrative tasks of arranging the details of the placements. The timetable below gives a general indication of how the course will unfold. Note – the specifics of the placement will vary from school to school, but it is assumed that students will spend the equivalent of 8-10 mornings or afternoons in their assigned school. The Week numbers correspond to the

Semesters at the University of Glasgow (late September through end of November for Semester 1; mid-January through end of March for Semester 2). The timings of the assessment may vary – normally, no work will be asked for until all students have completed their placements.

Semester 1: Project work in school

Mid-September	Introduction session(s) – <ul style="list-style-type: none"> ▪ Administration meeting at UoG, and chance to meet school teacher ▪ “Acclimitization” visit to school – duration to be arranged on case by case basis – allows students to get familiar with the school they’ll be working in.
Weeks 1-11	Work in school – average of one afternoon per week, though exact timetable would be worked out with individual student and teacher.
Week 3	Session detailing the use and maintenance of a reflective journal
Week 12	Submission of assessment by school teacher

Semester 2: Preparation of written and oral presentations

Week 4/5	Oral presentation by student
Week 10	Submission of written report and journal by student

Please note that lecture recordings, if available, and ALL course materials provided are for your own personal use and can only be used in relation to your studies. Any unauthorised distribution of course materials, including uploading them onto unauthorised web sites and social media sites, such as YouTube or Course Hero, will be considered in breach of the code of conduct and will be subject to disciplinary action.

3.3 Assessment

The summative course assessment will be a weighted combination of four elements:

Item	Description	Weighting	Deadline	Assessed by
Teacher assessment	Report from teacher on the work carried out by student	15 %	End of placement	Teacher
Oral presentation	An oral report on the work the student carried out	15 %	~ Week 4, Semester 2 (February)	Course organiser
Final report	Formal report of student's work, including a critical evaluation of the overall experience and the success of the project.	45 %	Week 10, Semester 2 (Mid March)	Course organiser
Student reflective journal	Record of progress of student's work week by week, including details of Project and other classroom and development work.	25 %	Week 10, Semester 2 (Mid March)	Course organiser

In accordance with the School of Physics & Astronomy's feedback and assessment policy, students will normally receive the results of their assessments within 15 working days of submission. Exact submission deadlines will be given by Course Organiser during the year.

Full details of assessment criteria can be found in section 4.

4 Assessment criteria

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Teacher's assessment of student performance

Student:		School:	
Teacher:			

1. Student's ability to work independently

Mark (/20)

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2. Student's overall organisation and planning

Mark (/20)

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3. Originality of student's ideas

Mark (/20)

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4. Student's clarity of explanation

Mark (/20)

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5. Student's enthusiasm and engagement

Mark (/20)

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Overall comments

Total mark/100

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Signed: _____ Date: _____

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Oral Presentation: Criteria

Summary:

- The presentation accounts for 15 % of your final grade for the course.
- Each student is allotted 15 minutes – it is assumed that you will speak for 10 minutes, with 5 minutes following for questions.

The content of the presentation:

- The exact content is up to the student, but the presentation should focus on the work that you have undertaken on your placements. You could, for example, focus on your special project, or alternatively on the more general experiences you had on the course.

Criteria:

- Your presentation will be assessed against the following criteria. You should take this into consideration when constructing and writing your report.

1. Presentation quality

- a. Was the presentation well-structured?
- b. Did the student make appropriate use of visual aids to help develop the theme?
- c. Did the presentation keep to time?
- d. Was the presentation fluent and the questions handled confidently?

2. Scholarly quality

- a. Was the subject matter set in the appropriate context?
- b. Was the subject matter treated sufficiently comprehensively, and in sufficient depth?
- c. Did the student demonstrate a firm grasp of the material presented?
- d. Did the student provide a suitably informative overview of their experience in school?
- e. Did the student present appropriate conclusions, supported by valid arguments and/or evidence?

Submission:

- If you are using powerpoint/pdf for your presentation, the file should be submitted electronically to the course organiser by NO LATER than 1100 the day of the presentation to allow all files to be uploaded to a common computer.
- The submitted files should have a file name in the following form:
GUIDNUMBER_PECPRES.ppt/pptx/pdf/etc

Physics Education & Communication in Schools

Oral Presentation: Assessment form

Student:		School:	
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Assessment of student's ORAL PRESENTATION

1. Presentation quality

Was the presentation well-structured?

Did the presentation keep to time?

Did the student make appropriate use of visual aids to help develop the theme?

Was the presentation fluent and the questions handled confidently?

Comments here:

Please rate the presentation quality of this presentation from the list below:

Very poor (G)	Poor (F)	Weak (E)	Satisfactory (D)	Good (C)	Very good (B)	Excellent (A)

2. Scholarly quality

Was the subject matter set in the appropriate context?

Did the student provide a suitably informative overview of their experience in school?

Was the subject matter treated sufficiently comprehensively, and in sufficient depth?

Did the student present appropriate conclusions, supported by valid arguments and/or evidence?

Did the student demonstrate a firm grasp of the material presented?

Comments here:

Please rate the scholarly quality of this presentation from the list below:

Very poor (G)	Poor (F)	Weak (E)	Satisfactory (D)	Good (C)	Very good (B)	Excellent (A)

Overall thoughts

Comments here:

Final grade
(22pt scale)

Physics Education & Communication in Schools

Report: Criteria

Summary:

- This report accounts for 45 % of your final grade for the course.
- It should be 2500 (\pm 200) words long.

The purpose of the report:

- The final report is akin to a laboratory report – you will write up a final report that collects together your experiences. You are expected to reflect in detail on your work. Where your journal contains your thoughts as the year unfolded, the report is your opportunity to reflect on the year as a whole. You should take the opportunity to detail your project, but the report should not be only on the project. You do not need to include references to the published literature. If, though, you find that your experiences tie in with any papers you may have read, or indeed run contrary to what you read, you can make those connections. An abstract is not required.

Criteria:

Category	Criteria
Clarity of presentation	<ul style="list-style-type: none">▪ Is the report neatly word-processed?▪ Is the English correct?▪ Is the report clearly structured and do all the parts tie together into one cohesive whole? Does it contain clear aims?▪ Is the work within the permitted word count?
Overall organisation and planning on placement	<ul style="list-style-type: none">▪ Is it clear that the student was active in organising and planning their placement?▪ Is it clear how the placements were structured? Where did they take place, how often, which types of classes?
Originality of student's own ideas	<ul style="list-style-type: none">▪ Is it clear that the student played an active role in shaping the placement?

on placement	<ul style="list-style-type: none"> ▪ What did the student do on the placement? What types of activities were they engaged in during the placement? ▪ Is the project explained clearly?
Critical analysis of, and reflection upon, progress	<ul style="list-style-type: none"> ▪ Has the student reflected on how the placements went? Is there evidence of an overview reflection of the whole experience? ▪ Has the student discussed their own actions, and those of other teachers and/or pupils? ▪ If things did not go to plan, is there exploration of potential alternatives that could have been tried?
Enthusiasm and engagement	<ul style="list-style-type: none"> ▪ Is it clear how the student viewed their overall experience? If positive, is that enthusiasm clear from the content; if negative, have the reasons for this been explored?

Submission:

- The report should be submitted as a pdf file with a filename in the following form: GUIDNUMBER_PECREPORT.pdf
- Files submitted in the wrong format, or with a wrongly formatted filename will be rejected.
- Submission deadline is 1600 on the Friday of week 10 in Semester 2.
- Late submission will be subject to a 10 % reduction in grade per working day late.

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Report: Assessment form

Student:	
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Assessment of student's FINAL REPORT

Summary:

- This report accounts for 45 % of your final grade for the course.
- Your report was assessed against the following criteria.

- 1. Student's clarity of presentation*
- 2. Student's overall organisation and planning*
- 3. Originality of student's ideas*
- 4. Student's critical analysis of, and reflection upon, progress*
- 5. Student's enthusiasm and engagement*

Feedback

**Final grade
(22 pt scale)**

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Physics Education & Communication in Schools

Journal: Criteria

Summary:

- This journal accounts for 25 % of your final grade for the course.
- There is no specific length for this, nor strict format but be aware that is very difficult to demonstrate critical reflection is very short terse pieces of text. Although your reflections require some narrative in order to explain what happened you will need to go beyond the “what” to the “how” and the “why”. You should reflect on all tutorials that you take part in. The journal can take the form of a hand-written lab-book or an electronic record if you prefer. It is not a formal report though – it should represent your thoughts and reflections as they are at the time of the tutorials.

Criteria:

- Your journal will be assessed against the following criteria, based on the framework published by Hatton & Smith (1995). These criteria are summarised below. You may find it useful to use the framework of Johns & Graham (1996) to help try to determine where on the Hatton & Smith scale you are.

Grade range	Equivalent reflection level	Detail
A1 → A5	Critical reflection	Journal shows consistent consideration of broader historical, social and/or political contexts
B1 → B3	Dialogic reflection	Journal shows continued discourse with self; exploration of the situation
C1 → C3	Descriptive reflection	Journal contains a description of events with reasons/recognition of alternate viewpoints
D1 → D3	Descriptive writing	There is no reflection, just a description of events without reasons or justifications
E1 → H	NA	Journal is missing entries for significant proportions of the placements attended, without good cause.

Submission:

- **IF** you are submitting an electronic journal, then it should be submitted as a pdf file with a filename in the following form: GUIDNUMBER_PECJOURNAL.pdf
- If your journal is hand-written, make sure your name and ID Number are clearly marked on the front.
- Submission deadline is 1600 on the Friday of week 10 in Semester 2.
- Late submission will be subject to a 10 % reduction in grade per working day late.

Physics Education & Communication in Schools

Journal: Assessment form

Student:	
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Assessment of student's JOURNAL

Summary:

- This journal accounts for 25 % of your final grade for the course.
- There is no specific length for this, nor strict format but be aware that is very difficult to demonstrate critical reflection is very short terse pieces of text. Although your reflections require some narrative in order to explain what happened you will need to go beyond the “what” to the “how” and the “why”. You should reflect on all tutorials that you take part in. The journal can take the form of a hand-written lab-book or an electronic record if you prefer. It is not a formal report though – it should represent your thoughts and reflections as they are at the time of the tutorials.

Feedback:

	Final grade (22 pt scale)