Physics (PH) modules

PH1011 Physics 1A				
SCOTCAT Credits:	20	SCQF Level 7	**Semester:**	1
Academic year:	2017/8 & 2018/9			
Planned timetable:	12.00 noon lectures, one afternoon from five each week, 2.00 pm - 3.00 pm tutorial and 3.00 pm -5.30 pm lab			
This module covers the core subjects of mechanics, waves and optics, and also provides an overview of the physical properties of matter. It is suitable for those who have studied physics to the level of Higher Physics or equivalent. It includes lectures on Newton's laws, work and energy, simple harmonic motion, the different types of wave motion, geometrical and wave optics, and the nature and composition of nuclei, atoms, molecules and solids, and their interactions. Relevant laboratory work is an important part of the module.				
Programme module type:	Compulsory for Astrophysics, Single and Joint Honours Physics, Single and Joint Honours Theoretical Physics (First Year Entry)			
Pre-requisite(s):	SQA Higher or A-Level Physics and Mathematics, both at grade B or better, or equivalent.			
Anti-requisite(s):	AS1002			
Learning and teaching methods and delivery:	**Weekly contact**: Typically 4 lectures, 1 problem-solving workshop, 1 tutorial and 1 x 2.5-hour laboratory.			
	Scheduled learning: 85 hours		**Guided independent study:** 115 hours	
Assessment pattern:	**As defined by QAA:** Written Examinations = 75%, Practical Examinations = 0%, Coursework = 25%			
	As used by St Andrews: 2-hour Written Examination = 60%, Class Test = 15%, Laboratory Work = 25%			
Re-assessment pattern:	2-hour Written Resit Examination = 60%, combined with existing Laboratory Work = 25%, existing Class Test = 15%			
Additional information from School:	Please see also the information in the School's Handbook for First and Second Level modules available via https://www.st-andrews.ac.uk/physics/staff_students/timetables.phpThis link also gives access to timetables for such modules.			
Module coordinator:	Dr P Woitke			
Module teaching staff:	Dr P Woitke, Prof M Gather, Dr B Sinclair, Dr C Rae			

PH1012 Physics 1B

SCOTCAT Credits:	20	SCQF Level 7	**Semester:**	2
Academic year:	2017/8 & 2018/9			
Planned timetable:	12.00 noon lectures; One afternoon from up to five per week, 2.00 pm - 3.00 pm tutorial, 3.00 pm - 5.30 pm lab			
This module covers an introduction to quantum mechanics, the mechanics of rotation and gravity and an introduction to lasers. The module is suitable for those who have studied physics to the level of Higher Physics or equivalent. It includes lectures on the origins of quantum theory, its application to atoms and other small-scale systems; the principles of lasers, and some aspects of optical communication. The module also includes a set of group-based activities associated with the use of physics ideas to solve an interesting problem. Relevant laboratory work is an important part of the module.				
Programme module type:	Compulsory for Astrophysics, Single and Joint Honours Physics, Single and Joint Honours Theoretical Physics (First Year Entry)			
Pre-requisite(s):	PH1011		**Anti-requisite(s):**	AS1002
Learning and teaching methods and delivery:	**Weekly contact**: Typically 4 lectures, 1 workshop, 1 tutorial and 1 x 2.5 hr laboratory. Group Discovery Project replaces some lectures for part of the semester.			
	Scheduled learning: 82 hours		**Guided independent study:** 118 hours	
Assessment pattern:	**As defined by QAA:** Written Examinations = 60%, Practical Examinations = 0%, Coursework = 40%			
	As used by St Andrews: 2-hour Written Examination = 50%, Class Test = 10%, Laboratory work = 25%, Group Discovery Project = 15%			
Re-assessment pattern:	2-hour Written Resit Examination = 50%, combined with existing Laboratory work = 25%, and existing Group Discovery Project = 15%, existing class test 10%			
Additional information from School:	Please see also the information in the School's Handbook for First and Second Level modules available via https://www.st-andrews.ac.uk/physics/staff_students/timetables.phpThis link also gives access to timetables for such modules.			
Module coordinator:	Dr P Wahl			
Module teaching staff:	Dr P Wahl, Dr L Hadfield, Dr D Cassettari, Prof T Brown, Dr C Rae			

PH1501 Mathematics for Physicists 1A

SCOTCAT Credits:	20	SCQF Level 7	**Semester:**	1
Academic year:	2017/8 & 2018/9			
Availability restrictions:	Available only to those on the Physics and Astronomy (Gateway) Programme and the Physics and Astronomy International Gateway Programme.			
Planned timetable:	To be arranged.			
This module is designed to give physics students a secure base in elementary calculus and other mathematical tools to enable them to access the mathematics modules needed for progression into physics and astronomy degrees. Participants will learn to use this mathematics effectively and efficiently in the context of work in physics. Some of the work is a revision and practice of material that will normally have been seen in the Scottish Higher and some A-Level maths syllabuses. The content is similar to that in MT1001 and will allow students to progress to MT1002 in semester 2.				
Programme module type:	Physics and Astronomy (Gateway) Programme Physics and Astronomy International Gatway Programme			
Pre-requisite(s):	Entry to Physics and Astronomy (Gateway) or International Gateway Programmes.		**Anti-requisite(s):**	MT1001
Co-requisite(s):	PH1011, PH1502			
Learning and teaching methods and delivery:	**Weekly contact**: 5 lectures, 1 tutorial and 1 workshop.			
	Scheduled learning: 72 hours		**Guided independent study:** 128 hours	
Assessment pattern:	**As defined by QAA:** Written Examinations = 70%, Practical Examinations = 0%, Coursework = 30%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework (Class Tests, 20%, Other Coursework,30%) = 50%			
Re-assessment pattern:	2-hour Written Examination = 100%			
Additional information from School:	Please see also the information in the School's Handbook for First and Second Level modules available via https://www.st-andrews.ac.uk/physics/staff_students/timetables.phpThis link also gives access to timetables for such modules.			
Module coordinator:	Dr I Leonhardt			
Module teaching staff:	Dr I Leonhardt, Dr J Lovett, Maths staff			

PH1502 Physics Skills 1A

SCOTCAT Credits:	20	SCQF Level 7	**Semester:**	1
Academic year:	2017/8 & 2018/9			
Availability restrictions:	Available only to those on the Physics and Astronomy (Gateway) Programme and the Physics and Astronomy International Gateway Programme			
Planned timetable:	To be arranged.			
This module develops academic and transferable skills in problem-solving, team-working, information retrieval and analysis, and study skills. It is a core module of the level one programme "Physics and Astronomy (Gateway)".				
Programme module type:	Physics and Astronomy (Gateway) Programme Physics and Astronomy International Gateway Programme			
Pre-requisite(s):	Entry to Physics and Astronomy (Gateway) or International Gateway Programme			
Co-requisite(s):	PH1011 and PH1501		**Anti-requisite(s):**	AS1101
Learning and teaching methods and delivery:	**Weekly contact**: 2 lectures, 3 x 1.25-hour workshops, 1 x 3-hour lab, 1 x 2-hour supported study session.			
	Scheduled learning: 108 hours		**Guided independent study:** 92 hours	
Assessment pattern:	**As defined by QAA:** Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Re-assessment pattern:	60% new assignments, 40% marks for the assignments that make up the first assessment specification of the module.			
Additional information from School:	Please see also the information in the School's Handbook for First and Second Level modules available via https://www.st-andrews.ac.uk/physics/staff_students/timetables.phpThis link also gives access to timetables for such modules.			
Module coordinator:	Dr P Cruickshank			
Module teaching staff:	Dr P Cruickshank, Dr A Mortier, Dr J Lovett			

PH1503 Physics Skills 1B

SCOTCAT Credits:	20	SCQF Level 7	**Semester:**	2
Academic year:	2017/8 & 2018/9			
Availability restrictions:	Available only to those on the Physics and Astronomy (Gateway) Programme and the Physics and Astronomy International Gateway Programme			
Planned timetable:	To be arranged.			
This module develops academic and transferable skills in problem solving in physics, in mathematical modelling of physical systems, in numerical/computational work applied to physics, and in study skills. It is a core module for the level one programme "Physics and Astronomy (Gateway)".				
Programme module type:	Physics and Astronomy (Gateway) Programme Physics and Astronomy International Gateway Programme			
Pre-requisite(s):	Entry to Physics and Astronomy (Gateway) or International Gateway Programme			
Co-requisite(s):	PH1012			
Learning and teaching methods and delivery:	**Weekly contact**: 2 lectures, 3 x 1.25-hour workshops, 1 x 3-hour lab, 1 x 2-hour supported study session			
	Scheduled learning: 118 hours		**Guided independent study:** 82 hours	
Assessment pattern:	**As defined by QAA:** Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Re-assessment pattern:	60% new assignments, 40% marks for the assignments that make up the first assessment specification of the module.			
Additional information from School:	Please see also the information in the School's Handbook for First and Second Level modules available via https://www.st-andrews.ac.uk/physics/staff_students/timetables.phpThis link also gives access to timetables for such modules.			
Module coordinator:	Dr A Kohnle			
Module teaching staff:	Dr A Kohnle, Dr A Mortier, Dr G Smith, Dr J Lovett			

PH2011 Physics 2A

SCOTCAT Credits:	30	SCQF Level 8	**Semester:**	1
Academic year:	2017/8 & 2018/9			
Planned timetable:	10.00 am lectures; one problem solving workshop and lab chosen from Tue, Thu or Fri (2.00 pm - 5.30 pm); one tutorial to be arranged.			
This module covers the subjects of mechanics, special relativity, oscillations, and thermal physics. It is suitable for those who have taken the specified first year modules in physics and mathematics, or have good Advanced Higher or A-level passes or equivalent in physics and mathematics. It includes lectures on the dynamics of particles and rigid bodies, Einstein's special theory of relativity, free, forced and damped harmonic motion, and lectures on thermal physics including elementary thermodynamics and the notion of entropy.				
Programme module type:	Compulsory for Astrophysics, Single and Joint Honours Physics, Single and Joint Honours Theoretical Physics			
Pre-requisite(s):	PH1011, PH1012 and MT1002; alternatively passes in Advanced Higher Physics and Mathematics or A-Level Physics and Mathematics, both normally at grade A or equivalent.			
Anti-requisite(s):	AS1002			
Required for:	PH3073, PH4038 and all other honours modules in physics and astronomy			
Learning and teaching methods and delivery:	**Weekly contact**: 4 or 5 lectures, 1 workshop, 1 tutorial and 1 x 2.5-hour laboratory.			
	Scheduled learning: 97 hours		**Guided independent study:** 203 hours	
Assessment pattern:	**As defined by QAA:** Written Examinations = 70%, Practical Examinations = 0%, Coursework = 30%			
	As used by St Andrews: 3-hour Written Examination = 60%, Class Test = 10%, Laboratory work = 25%, lectures and pre-lecture questions = 5%			
Re-assessment pattern:	3-hour Written Resit Examination = 60%, combined with existing Class Test = 10%, Laboratory Work = 25%, and lecture and pre-lecture questions = 5%.			
Additional information from School:	Please see also the information in the School's Handbook for First and Second Level modules available via https://www.st-andrews.ac.uk/physics/staff_students/timetables.phpThis link also gives access to timetables for such modules.			
Module coordinator:	Dr P Cruickshank			
Module teaching staff:	Dr P Cruickshank, Dr G Smith, Prof S Lee, Dr C Baily, Dr I Leonhardt, Dr C Rae			

PH2012 Physics 2B

SCOTCAT Credits:	30	SCQF Level 8	**Semester:**	2
Academic year:	2017/8 & 2018/9			
Planned timetable:	10.00 am lectures; one problem solving workshop and lab chosen from Tue, Thu or Fri (2.00 pm - 5.30 pm); one tutorial to be arranged.			
This module covers the subjects of quantum physics, electricity and magnetism and classical waves. It is suitable for those who have taken the specified first year modules in physics and mathematics, or have good Advanced Higher or A-Level passes or equivalent in physics and mathematics. It includes lectures on the origin of Schrödinger's equation in quantum mechanics and its solution for simple one-dimensional potentials; an elementary introduction to the electromagnetic field comprising electrostatics, magnetostatics, electromagnetic induction and circuit theory; and lectures on waves, acoustics, polarisation of light, and interference.				
Programme module type:	Compulsory for Astrophysics, Single and Joint Honours Physics, Single and Joint Honours Theoretical Physics			
Pre-requisite(s):	PH2011*. Also PH1011, PH1012 and MT1002; alternatively passes in Advanced Higher Physics and Mathematics or A-Level Physics and Mathematics, both normally at grade A. *the School may be willing to waive in special cases.			
Required for:	AS4010, AS4011, PH3007, PH3081, PH3082, PH4022, and all other AS and PH modules at levels 3, 4, and 5.			
Learning and teaching methods and delivery:	**Weekly contact**: 4 or 5 lectures, 1 workshop, 1 tutorial and 1 x 2.5-hour laboratory.			
	Scheduled learning: 105 hours		**Guided independent study:** 195 hours	
Assessment pattern:	**As defined by QAA:** Written Examinations = 70%, Practical Examinations = 0%, Coursework = 30%			
	As used by St Andrews: 3-hour Written Examination = 60%, Class Test = 10%, Laboratory work = 25% , lecture and pre-lecture questions = 5%			
Re-assessment pattern:	3-hour Written Resit Examination = 60%, combined with existing Class Test = 10%, Laboratory Work = 25% and lecture and pre-lecture questions = 5%.			
Additional information from School:	Please see also the information in the School's Handbook for First and Second Level modules available via https://www.st-andrews.ac.uk/physics/staff_students/timetables.phpThis link also gives access to timetables for such modules.			
Module coordinator:	Dr P Cruickshank			
Module teaching staff:	Dr P Cruickshank, Dr C Baily, Dr B Sinclair, Dr C Rae			