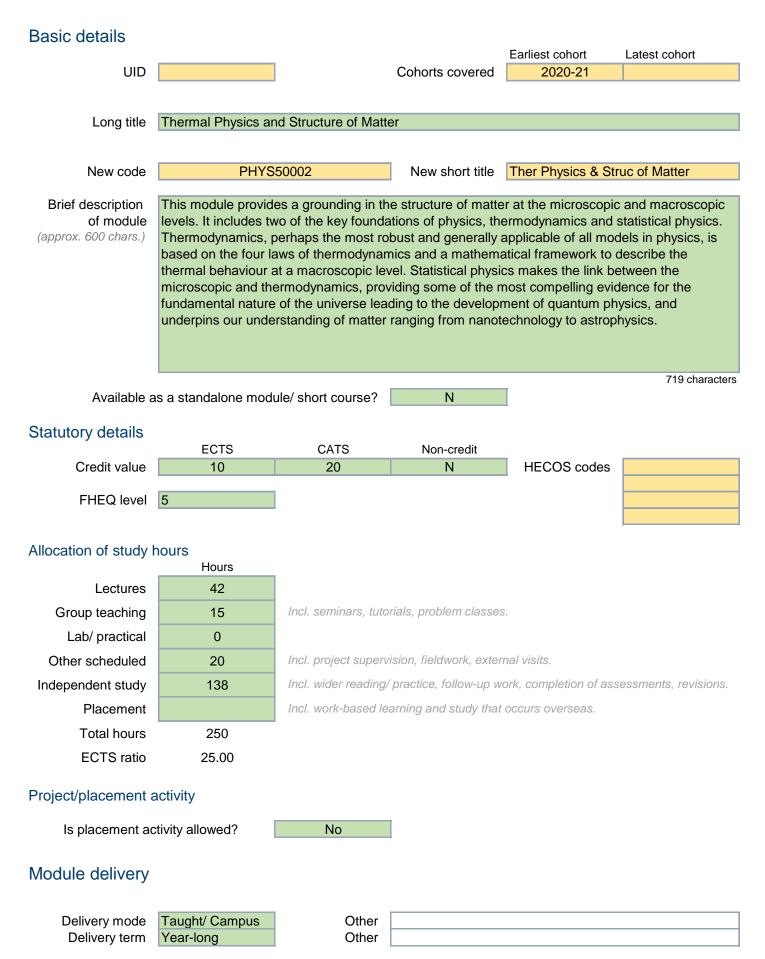
Imperial College London

Module Specification (Curriculum Review)



Ownership

Primary department	Physics		
Additional teaching departments	None		
Delivery campus	South Kensington		
Collaborative delivery			
	Collaborative delivery? N		
External institution	N/A		

Associated staff

External department

External campus

N/A

N/A

Role	CID	Given name	Surname
Module Leader		Vijay Carl	Tymms Paterson
		Carl	Paterson

Learning and teaching Module description

Learning outcomes	On completion of this module you will be able to:
	1) Describe how the atomic hypothesis can be used to explain several facets of the behaviour of matter on
	a macroscopic scale.
	2) Describe the assumptions of, and limitations to, kinetic theory and use the theory to perform detailed
	calculations on the behaviours of gases.
	3) Demonstrate an appreciation and understanding of the zeroth, first and third laws of thermodynamics
	and their applicability and generality across physics.
	4) State the various forms of the second law of thermodynamics, show the equivalence between them and
	describe how the law highlights a fundamental asymmetry in nature.
	5) Demonstrate an understanding of the assumptions of statistical mechanics and use statistical
	mechanics methods to model physical systems.
	6) Explain the meaning of entropy, temperature and thermodynamic equilibrium at the microscopic level
	and how laws of thermodynamics can arise from the microscopic laws of nature.
	7) Describe the origins of classical and quantum statistical distributions, and their applicability and use
	them to model and understand the behaviour of physical systems.
Module content	The module covers three subtopics. Structure of matter covers states of matter, the atomic hypothesis,
	kinetic theory and the Maxwell-Boltzmann distribution. Thermodynamics covers the four laws that govern
	the subject, heat capacities, the Maxwell relations, phase changes, chemical potential and entropy from a
	macroscopic viewpoint. Statistical physics inspects entropy on a microscopic scale, the partition function,
	statistical ensembles, density of states, and Fermi-Dirac and Bose-Einstein statistics.

Learning and Teaching Approach	Students will be taught over two terms using a combination of lectures, small-group teaching, office hours, study groups and directed exercises on theoretical, practical and computational work. There will be no actual laboratory or computational classes written into the timetable. Each of the shorter components within the module will have a kernel of core lecture material with other modes of delivery (for example small group teaching, quizzes and directed reading) brought in around this central unit.		
Assessment Strategy	An exam in term 3 covers all learning outcomes makes up 75% of summative assessment. In-course assessment comprises the remaining 25% of summative assessment.		
Strategy			
Feedback	Formative feedback will be provided throughout the module following formative assessment in the form of in-class quizzes, online tests, handwritten problems sheets and verbal feedback for any practical or computational exercises. Feedback for any continuous assessment will be provided within two weeks of the submission date. General feedback on written examinations for each module is provided in the form of written reports from the examiners for the students.		
 Reading list The module is self-contained and no additional books are required to be purchased by the students. Further discussion of material covered by the module, along with relevant problems can be found in: Seers and Zemansky's University Physics with Modern Physics by Young and Freedman Thermal Physics by Finn Statistical Physics by F. Mandl Entropy and its Physical Meaning by J. S. Dugdale The Feynman Lectures on Physics Volume I 			
Quality assurance	ce Office use only		
Date of first approval Date of last revision Date of this approval	QA Lead Department staff Date of collection		

Module leader	Vijay Tymms	Date exported Date imported	
Notes/ comments			

Template version 16/06/2017

Programme structure Associated modules

UID	Legacy code	Module title	Requisite type

UID	Legacy code	Module title	Requisite type

Assessment details

Grading method Numeric

Pass mark 40%

Assessments

Assessment type	Assessment description	Weighting	Pass mark	Must pass?
Examination	2-hour examination	759	6	N
Examination	In-course assessment	259	6	N
		1009	6	