

Basic details

UID	<input type="text"/>	Cohorts covered	Earliest cohort 20223-24	Latest cohort <input type="text"/>
Long title	<input type="text" value="Information Theory"/>			
New code	<input type="text" value="PHYS70004"/>	New short title	<input type="text"/>	
Brief description of module <i>(approx. 600 chars.)</i>	<input type="text" value="This module will cover the fundamentals of modern information theory, starting with the laws of probability and then applying them to the storage and transmission of (digital) information. This includes both source and channel coding, Shannon's theorems, and the mitigation of noise for both continuous and digital signals."/>			
				324 characters
Available as a standalone module/ short course?	<input type="text" value="Y"/>			

Statutory details

Credit value	ECTS <input type="text" value="5"/>	CATS <input type="text" value="10"/>	Non-credit <input type="text" value="N"/>	HECOS codes	<input type="text"/>
FHEQ level	<input type="text" value="Level 7"/>				<input type="text"/>
					<input type="text"/>
					<input type="text"/>

Allocation of study hours

	Hours	
Lectures	<input type="text" value="15"/>	
Group teaching	<input type="text" value="0"/>	<i>Incl. seminars, tutorials, problem classes.</i>
Lab/ practical	<input type="text" value="0"/>	
Other scheduled	<input type="text" value="10"/>	<i>Incl. project supervision, fieldwork, external visits.</i>
Independent study	<input type="text" value="100"/>	<i>Incl. wider reading/ practice, follow-up work, completion of assessments, revisions.</i>
Placement	<input type="text" value="0"/>	<i>Incl. work-based learning and study that occurs overseas.</i>
Total hours	125	
ECTS ratio	25.00	

Project/placement activity

Is placement activity allowed?

Module delivery

Delivery mode	<input type="text" value="Taught/ Campus"/>	Other	<input type="text"/>
Delivery term	<input type="text"/>	Other	<input type="text" value="Term 1, exam in term 3"/>

Ownership

Primary department	<input type="text" value="Physics"/>
Additional teaching departments	<input type="text"/>
	<input type="text"/>

Delivery campus

Collaborative delivery

Collaborative delivery?

External institution
External department
External campus

Associated staff

Role	CID	Given name	Surname
Module Leader		Andrew	Jaffe

Learning and teaching

Module description

Learning outcomes	Students who complete this module should be able to: know the laws of probability; use them to solve inference problems; identify and quantify the information gain in a given context; use entropy and related concepts to assess an information storage or transmission system; apply and assess source and channel coding methods; calculate the effects of noise on information transmission and storage.
Module content	The module will cover: the laws of probability; the definition and quantification of information; information entropy; source coding and data compression; channel coding and error detection/correction; use of analogue signals to transmit digital information; effect of noise on information gain.
Learning and Teaching Approach	The module content will primarily be delivered in lecture sessions. There will be some inverted learning, with the contact hours used to work through questions from the problem sheets.
Assessment Strategy	The assessment will be primarily by written exam in order to assess how well the students know the fundamentals of this topic. There will be a short mid-course assignment that makes up 10% of the module mark.
Feedback	The mid-course assignment will be the primary means of giving formative feedback to the students; this will include full comments, along with a provisional mark.
Reading list	<ul style="list-style-type: none">• Information Theory, Inference and Learning Algorithms, MacKay, D.J.C., 2004, Cambridge University Press• Information and Measurement, Lesurf, J.G.C., 2002, Institute of Physics• Information and Communication for Engineers, Usher, M.J. & Guy, C.G., 1997, Macmillan

Quality assurance

Date of first approval
Date of last revision
Date of this approval

Office use only

QA Lead
Department staff
Date of collection

Module leader

Andrew Jaffe

Date exported

Date imported

Notes/ comments

UID	Legacy code	Module title	Requisite type

