

Basic details

UID	<input type="text"/>	Cohorts covered	Earliest cohort <input type="text" value="2025-26"/>
Long title	<input type="text" value="Magnetic Confinement Fusion"/>		
New code	<input type="text" value="PHYS70077"/>	New short title	<input type="text"/>
Brief description of module <i>(approx. 600 chars.)</i>	<input type="text" value="This module covers the advanced plasma physics concepts specific to the approach to magnetic confinement fusion. The fusion plasma physics processes central to magnetised configurations are examined. Fundamental topics of energy and particle confinement are considered in terms of plasma transport. The complex magnetic equilibrium and stability of tokamaks are introduced, along with disruption limits. Plasma heating in present day tokamaks and stellarators are also included, in addition to the dynamic surface interaction and first-wall energy deposition."/>		
Available as a standalone module/ short course?	<input type="text" value="N"/>		

Statutory details

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

Allocation of study hours

	Hours	
Lectures	<input type="text" value="18"/>	
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="97"/>	<i>Incl. wider reading/ practice, follow-up work, completion of assessments</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"/>
Start term	<input type="text" value="Spring"/>	Other	<input type="text" value="Term 2, exam in Term 3"/>

Ownership

Primary department

Additional teaching departments **None**

Delivery campus **South Kensington**

Collaborative delivery

Collaborative delivery? **N**

External institution **N/A**
 External department **N/A**
 External campus **N/A**

Associated staff

Role	CID	Given name	Surname
Module Leader	948151	Yasmin	Andrew

Learning and teaching

Module description

Learning outcomes	<p>On completing the Magnetic Confinement Fusion module students will be able to:</p> <ul style="list-style-type: none"> - Demonstrate a comprehensive knowledge and understanding of the physics underlying confinement and stability in the helical magnetic configuration - Describe and compare a wide range of magnetic confinement fusion plasma heating applications - Explain plasma boundary physics and apply topical insights to analyse fusion power exhaust - Apply knowledge of alternative magnetic confinement devices to analyse and evaluate alternative fusion energy strategies - Critically select and apply appropriate analytical techniques and problem solving skills for confined fusion plasmas.
Module content	<p>The module will cover:</p> <ul style="list-style-type: none"> - Physics of magnetic confinement - Equilibrium and macroscopic stability - Turbulence - Plasma heating and current drive - Plasma-wall interactions and magnetic divertors <p>Atomic and molecular process</p> <ul style="list-style-type: none"> - Alternative magnetic confinement fusion concepts
Learning and Teaching Approach	<p>Students will be taught over one term using a combination of lectures and office hours. Lectures are supported with Rapid Feedback sessions for problem sheets. The lectures will include examples of current magnetic confinement fusion research.</p>
Assessment Strategy	<p>100% summative assessment is based on a final, written exam of two hours. Informal assessment of problem sheet answers is available through Rapid Feedback sessions (on submitted attempts) and also informally in the course office hours.</p>
Feedback	<p>Approximately four problem sheets are provided along with example solutions. These are assessed and aim to provide guidance on the course material. Students can receive help with the answers, as well as feedback on their own workings in the course office hours and Rapid Feedback sessions.</p>
Reading list	<p>A complete set of lecture notes are provided for the course. The notes are designed to be</p>

there is no designated textbook required for this module. There are some suggested textbooks supplementary reading and reference. The list of textbooks provided cover the taught material than the lectures.

..... "Plasma Physics: An Introductory Course", R.O. Dendy (Ed.), (Cambridge University Press, 2007)
"Tokamaks", J. Wesson (Oxford University Press, 2011)
"The Theory of Toroidally Confined Plasmas", Roscoe B White, (World Scientific Publishing, 1999)
"Magnetic Fusion Energy: from experiments to power plants", G.H Neilson (Woodhead Publishing, 2003)

Quality assurance

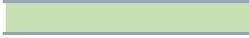
Date of first approval	
Date of last revision	
Date of this approval	

Notes/ comments

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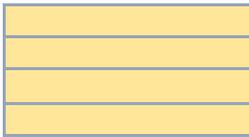
Template version

Latest cohort



Each of magnetic
, toroidal
mechanisms are
macroscopic
mechanisms in
physics of plasma

603 characters



revisions.



<p>plasma confinement</p> <p>approaches</p> <p>exhaust scenarios</p> <p>a range of sustainable</p> <p>or magnetically</p>
<p>-</p>
<p>learning will also be</p> <p>examples from current</p>
<p>Formative</p> <p>selected, pre-</p>
<p>tem sheets are not</p> <p>with approaches to</p> <p>rapid Feedback</p>
<p>self-contained and</p>

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16/06/2023