General Information

Module Code

PHY-4005A

Academic Year

2024/5

Module Title

ELECTROMAGNETISM AND WAVES

Module type

WW

Semester / Term

SEM1

Level

4

Credit Value

20

Scheme

UG

Related Modules:

Pre-requisite

Co-requisite

Forbidden

Timetable slot

Is this module suitable for inbound study abroad students?

Y

Additional costs

Maximum number of students

999

Module Organiser

Dr Kayn Forbes

Module Description

What is this module about?

You will be introduced to the fundamental theory of electricity and magnetism: charges, currents and electric and magnetic forces. You will also learn the essential theory of wave phenomena, including mechanical waves propagating in media, electromagnetic waves, and elementary optics.

Learning objectives and Outcomes

What are the Learning objectives?

This module will equip students with the foundational, conceptual and mathematical description of basic electric and magnetic phenomena as well as wave phenomena. The module will give practical experience of solving theoretical problems using the basic mathematical tools of physics.

What are the Learning Outcomes?

	Name	Details
1	Theory of electricity and magnetism	You will understand the basic properties of electrical charges, fields and a forces, be able to appreciate physical arguments using the corresponding concepts, and be able to apply them yourself to formulate physical arguments and to understand arguments
2	Theory of wave phenomena	You will know the fundamental properties and phenomena of wave motion, including mechanical waves and light. You will understand their basic mathematical description and the underlying concepts. You will be able to appreciate corresponding physical arguments and be able to apply the concepts to formulate your own physical arguments.
3	Problem solving and mathematical techniques	You will be able to apply the physical concepts together with the essential mathematical concepts and techniques to work out solutions to concrete problems in the areas of physics covered and you will be able to employ these mathematical techniques, as appropriate, in other areas of physics.

Learning activities and Effort hours

Learning activity	Total effort hours	Indicative effort hours per week
1. Class sessions (Lectures, workshops, lab sessions, seminars etc.)	36	3
2. Pre-class preparation and follow up study		
3. Work-based or Placement Hours		
4. Formative assessments/ activities	2	
5. Feedback/ Feed forward sessions		
6. Summative assessments (essays, dissertations, oral presentations, worksheets, lab reports etc.)	10	0.5
7. Background reading	94	8
8. Exams/ OSCEs	2	
9. Course Tests		
10. Tutorials (Individual or small groups)	6	0.5
Total Hours =	150.00	12.00

Learning Support Materials

Should this module be exempt from requiring an online reading list?

N

Link to Talis (https://uea.rl.talis.com/index.html)

Formative Assessments

Sequence	Assessment Type	Title	Deadline
FM1	Formative Assessment	Formative Assessment 1	
FM2	Formative Assessment	Formative Assessment 2	

Summative Assessments

Sequence	Assessment Type	Title	Deadline	Weighting	Method of submission	Method of return	Return date	Format and purpose of feedback
001	Written Assignment	Written Assignment	20/Nov/2024	40 / 100	Bb file submission point	VIA BLACKBOARD		
Further Details								
002	Semester 1 Exam	Exam		60 / 100	Bb file submission point	VIA BLACKBOARD		
Further Details								

Attribute Development

On this module students will develop knowledge, insights and attributes that are readily transferable into future or current work settings. The attributes are articulated below to help understand how the module will help students to thrive on their course and prepare them for the world of work. These attributes are also articulated within the UEA Award.

Academic excellence

- [x] In-depth and extensive knowledge, understanding and skills in chosen discipline(s)
- [ ] The ability to collect, collate, analyse and critically engage with a wide range of information sources, and evidence
- [ ] The ability to analyse and critically engage with a wide range of concepts and ideas

Critical thinking & problem solving

- [x] A capacity for independent, conceptual and creative thinking
- [x] A capacity for informed argument and logical reasoning
- [ ] A capacity for problem identification and problem-solving

Learning & personal development

- [ ] A commitment to developing professional values, self-insight and capabilities
- [x] The ability to respond positively to constructive criticism and feedback from peers, tutors and colleagues
- [x] Self-confidence and an ability to exercise own 'voice'

Digital literacy and IT

- [ ] Confidently employ a range of digital technologies for academic and professional/ career development purposes
- [ ] Use appropriate digital technologies and resources to locate diverse types of information for both academic and non-academic purposes
- [ ] The ability to critically evaluate and engage with the information obtained

Self-management & professionalism

- [x] A capacity for taking responsibilities and ownership of actions
- [x] An ability to manage time effectively, including setting priorities, juggling competing demands and meeting deadlines
- [ ] An understanding of work cultures and practices, including work place professionalism

Team working and leadership

- [ ] An ability to co-operate and collaborate with others, including working to shared aims
- [ ] An ability to take other viewpoints, have empathy for other people's position and give constructive feedback
- [ ] An ability to motivate and lead others, including taking the initiative and delegating when required

Communication

- [ ] An ability to communicate in written form for different purposes, audiences and contexts
- [x] An ability to communicate in person for different purposes, audiences and contexts
- [ ] An ability to network effectively with others for specific purposes

Applied numeracy and Technical proficiency

- [x] An ability to perform routine calculations in daily tasks and in applied contexts
- [x] An ability to analyse and interpret data and evidence
- [x] Proficiency in skilled techniques used for academic and professional purposes

Career management

- [ ] A capacity to reflect on and articulate qualities, strengths and attributes
- [ ] The ability to research specific job and career areas
- [ ] An ability to present your experience and attributes positively to graduate employers

Commercial awareness

- [ ] A knowledge of the link between academic subjects and their commercial applications
- [ ] An understanding of business priorities and the needs of graduate employers
- [ ] The ability to understand and prioritise customer needs

Innovation and enterprise

- [ ] The confidence to introduce and establish something new
- [ ] The potential to take an idea through to its practical application
- [ ] The potential to apply an enterprising mind-set to situations

Citizenship and stewardship

- [ ] An understanding of your place within local and global communities
- [ ] An awareness of the need to manage shared and finite resources, including an appreciation of moral and ethical dimensions
- [ ] An ability to improve the lives of others and lobby for positive change through community and/or political engagement