



University of
Salford
MANCHESTER

BSc Physics

First Year (Level 4) Induction Session

2024/25

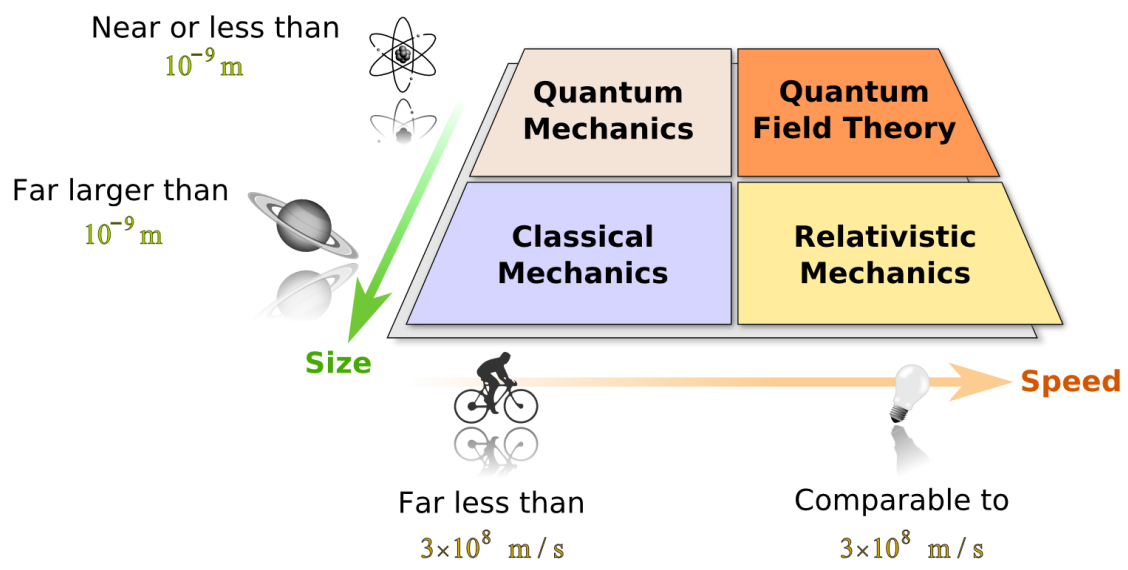
Dr Dan Bull

What is the purpose of the physics degree?

➤ TO LEARN PHYSICS

➤ TO LEARN TO **BECOME A PHYSICIST**

Mechanics, Relativity and Quantum Physics
Electricity, Magnetism and Light
Modelling of Physical Systems
Physics Laboratory 1
Mathematics
Physics in Context

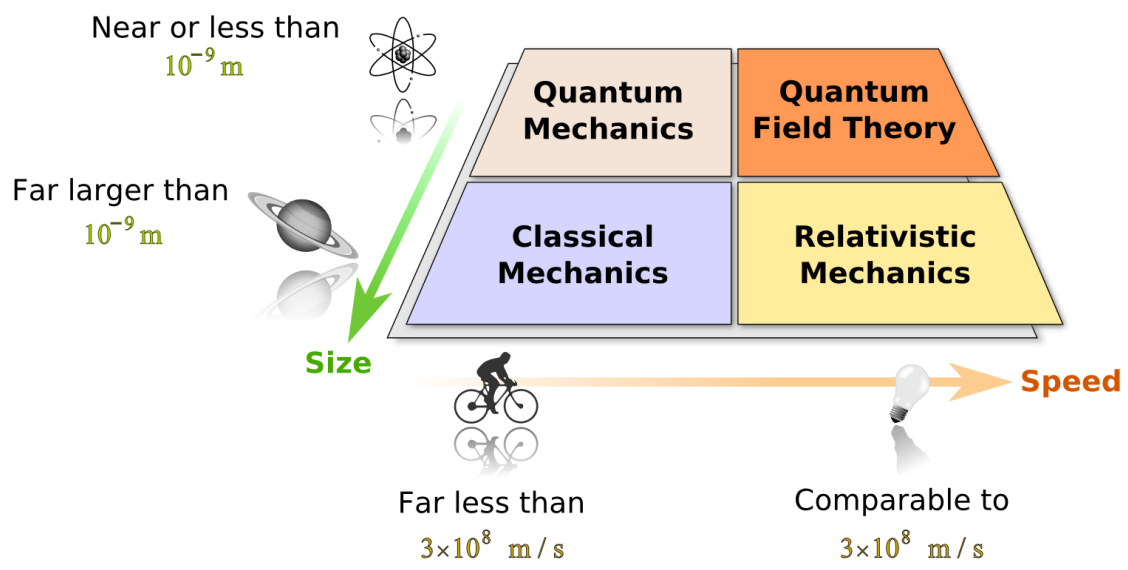


TRIMESTER 1: CLASSICAL MECHANICS

Prof Ian Morrison

- Dynamics in 1D, 2D and 3D
- Newton's Laws of Motion
- Work and Energy
- Momentum and Collisions
- Rotational Motion
- Angular Momentum

Mechanics, Relativity and Quantum Physics
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TRIMESTER 2: RELATIVITY AND QUANTUM PHYSICS

Dr Marina Leontiadou

- The Postulates of Special Relativity
- Lorentz Transformation
- Relativistic Momentum and Energy
- The Origins of Quantum Physics
- Photons and Matter Waves
- Electrons in Confinement: Quantisation of Energy

Mechanics, Relativity and
Quantum Physics

Electricity, Magnetism and Light

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TRIMESTER 1: ELECTRONICS AND ELECTRICITY

Dr Mark Hughes

- Electric current, voltage and resistance
- Electrical circuits and circuit networks
- Semiconductors
- Semiconductor Devices
- Electric Fields
- Capacitors and dielectrics

TRIMESTER 2: ELECTRIC AND MAGNETIC FIELDS

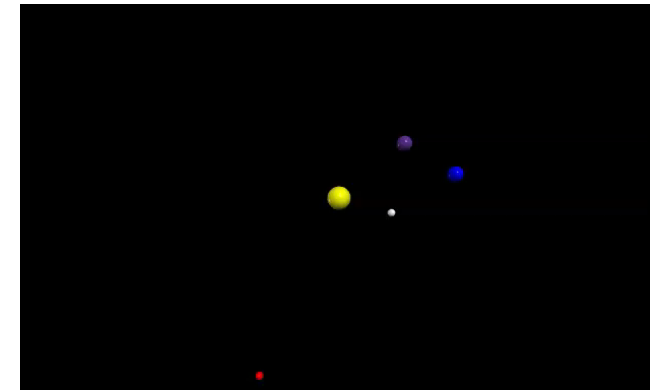
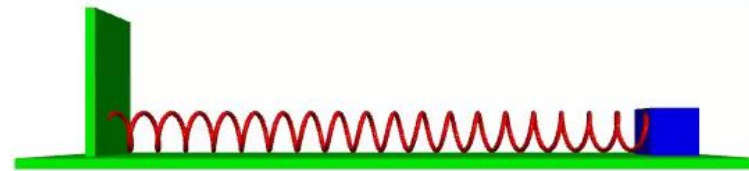
Dr Tiehan Shen

- Magnetic fields
- Electromagnetic Induction
- Inductors
- Alternating current
- Electromagnetic waves
- Ray optics

TRIMESTER 1 DYNAMICS OF PHYSICAL SYSTEMS

Dr Dan Bull

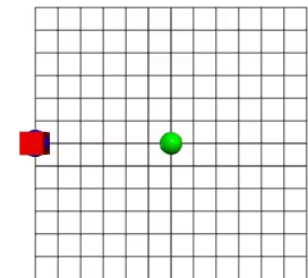
- ❑ Projectile motion under the effects of both gravity and air resistance
- ❑ Oscillatory motion: Linear simple harmonic motion and beyond
- ❑ Gravitation including planetary and satellite motion



TRIMESTER 2: THERMAL PHYSICS AND WAVES

Dr Dan Bull

- ❑ Transverse and longitudinal travelling waves
- ❑ Superposition of waves and standing waves
- ❑ Sound waves and the doppler effect
- ❑ Kinetic theory in gases: The origin of pressure
- ❑ Temperature and thermal transport
- ❑ The zeroth, first and second law of thermodynamics



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TRIMESTERS 1&2

Dr Mark Hughes and Dr John Proctor

- Measurement Skills, including quantifying precision
- Propagation of Errors
- Data Manipulation in a Spreadsheet
- Plotting of Data
- Curve Fitting
- Electronics
- Keeping an Effective Experimental Logbook
- A series of experiments across a range of areas in physics
- Reporting of Experiments in Physics

Mechanics, Relativity and
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TRIMESTERS 1&2

Dr Graham McDonald

- Algebra and Functions
- Differentiation and Integration
- Geometry: Co-ordinate systems
- Vectors
- Complex Numbers
- Ordinary Differential Equations: First Order Equations; Second Order Equations, Applications to Simple Physical Systems
- Series: Notions of Convergence; Taylor and Maclaurin Series Expansions; Power Series; Fourier Series

TRIMESTERS 1&2

Prof Ian Morrison

- ❑ A series of short thematic keynote lecture courses including seminars by external speakers demonstrating the role of the physicist in the workplace and the role of physics in addressing real world problems
- ❑ Skills Elements: Problem solving; team building; research skills; presentation skills; report writing and graphical presentation skills:
 - ❑ Learning how to present to different audiences
 - ❑ The development of free scientific thinking, to be able to look at problems and issues from different viewpoints and to formulate and present ideas;
 - ❑ The use of Fusion360 CAD/CAM software;
 - ❑ Producing an effective LinkedIn profile;
 - ❑ Scientific report writing and the research of relevant data, including the importance of accurate referencing

Mechanics, Relativity and
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Electricity, Magnetism and Light

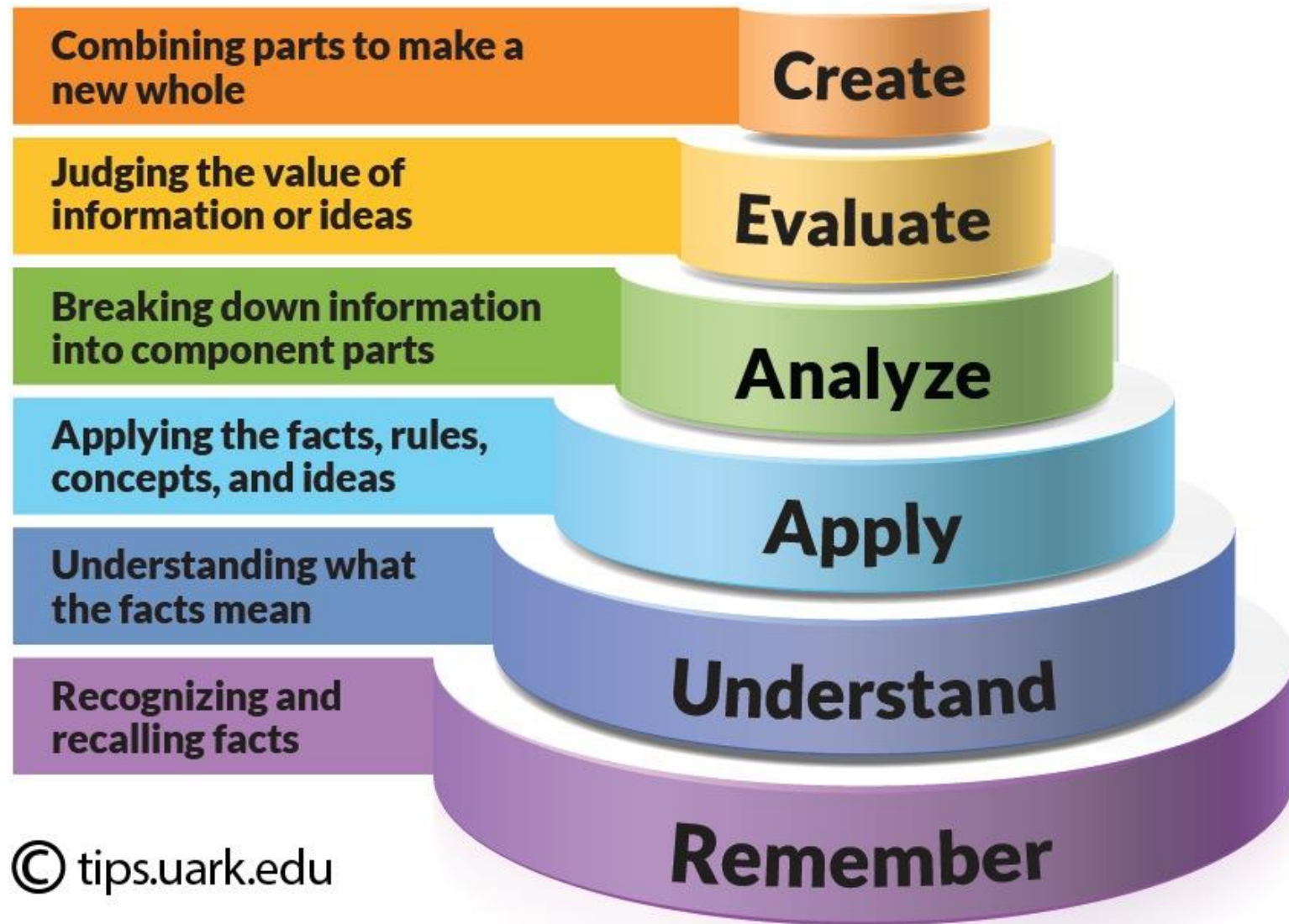
Modelling of Physical Systems

Physics Laboratory 1

Mathematics

Physics in Context

Bloom's Taxonomy of Learning



Trimester 1 Timetable

	9	10	11	12	13	14	15	16	17
Mon	Modelling of Physical Systems SEE Building: SB 2.10						Electricity, Magnetism and Light SEE Building SB2.11		
Tue						Mathematics ONLINE DELIVERY			
Wed									
Thu	Physics in Context SEE Building SB3.07				Physics Laboratory 1 SEE Building SB3.07				
Fri		Mathematics Peel 337		Physics in Context SB 2.01		Mechanics, Relativity and Quantum Physics Peel 102			

Location of Teaching Buildings



9 September 2024	<i>Welcome/Induction</i>	0		
16 September 2024	Trimester 1	1	1	✓
23 September 2024	Trimester 1	2	2	✓
30 September 2024	Trimester 1	3	3	✓
7 October 2024	Trimester 1	4	4	✓
14 October 2024	Trimester 1	5	5	✓
21 October 2024	Trimester 1	6	6	✓
28 October 2024	Trimester 1	7	7	✓
4 November 2024	Trimester 1	8	8	✓
11 November 2024	Trimester 1	9	9	✓
18 November 2024	Trimester 1	10	10	✓
25 November 2024	Trimester 1	11	11	✓
2 December 2024	Trimester 1	12	12	✓
9 December 2024	Trimester 1	13	13	✓
16 December 2024	<i>Christmas Vacation</i>	14		
23 December 2024	<i>Christmas Vacation</i>	15		
30 December 2024	<i>Christmas Vacation</i>	16		
6 January 2025	<i>Welcome/Induction</i>	17		✓
13 January 2025	Trimester 2	1	18	✓
20 January 2025	Trimester 2	2	19	✓
27 January 2025	Trimester 2	3	20	✓
3 February 2025	Trimester 2	4	21	✓
10 February 2025	Trimester 2	5	22	✓
17 February 2025	Trimester 2	6	23	✓
24 February 2025	Trimester 2	7	24	✓
3 March 2025	Trimester 2	8	25	✓
10 March 2025	Trimester 2	9	26	✓
17 March 2025	Trimester 2	10	27	✓
24 March 2025	Trimester 2	11	28	✓
31 March 2025	<i>Easter Vacation</i>	29		
7 April 2025	<i>Easter Vacation</i>	30		
14 April 2025	<i>Easter Vacation</i>	31		<i>(Bank Holiday Friday)</i>
21 April 2025	Trimester 2	12	32	✓ <i>(Bank Holiday Monday)</i>
28 April 2025	Trimester 2	13	33	✓

Assessment Deadlines

TRIMESTER 1 ASSIGNMENT DEADLINES

Modelling of Physical Systems	50%	Wednesday 4 th December
Mathematics	50%	Monday 9 th December
Mechanics, Relativity and Quantum Physics	50%	Wednesday 11 th December
Electricity, Magnetism and Light	50%	Friday 13 th December

TRIMESTER 2 ASSIGNMENT DEADLINES

Physics Laboratory 1 (Experimental Journal)	70%	Wednesday 12 th February
Physics in Context (Problem Solving Journal)	70%	Friday 21 st February
Modelling of Physical Systems	50%	Wed 26 th March
Physics in Context (Energy Project)	30%	Friday 28 th March
Physics Laboratory 1 (Electronics Journal)	30%	Wednesday 23 rd April
Mathematics	50%	Monday 28 th April
Mechanics, Relativity and Quantum Physics	50%	Wednesday 30 th April
Electricity, Magnetism and Light	50%	Friday 2 nd May