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MODULE DESCRIPTOR

Module Title

Foundations in Medicine Design

Reference	PL1002	Version	1
Created	April 2022	SCQF Level	SCQF 7
Approved	July 2022	SCQF Points	30
Amended	August 2021	ECTS Points	15

Aims of Module

To provide an introduction to physicochemical properties relevant to pharmaceuticals in the context of drug design and dosage forms.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Demonstrate an understanding of the basic physicochemical properties of pharmaceutical materials.
- 2 Apply mathematical expressions in relation to chemical and pharmaceutical systems.
- 3 Demonstrate an understanding of the techniques used to generate qualitative and quantitative experimental data and demonstrate data analysis and handling.

Indicative Module Content

The application of physicochemical principles in a quantitative way to engage with practical pharmaceutical issues such as medicine formulation, design, manufacture and delivery to the patient. Topics will include: Thermodynamics-energetics: processes of change such as drug dissolution or transfer of drugs across membranes. Drug solubility-concentrations; ideal and non-ideal solutions; colligative properties; colloids, solutions and dissolution rates. Physical properties of drugs and excipients-gases (aerosols), liquids, crystalline and amorphous solids. Ionisation of drugs in solution-equilibrium constants; acids, bases and salts; pH; buffer solutions; partitioning. Preformulation-the importance of determining drug and excipient properties and compatibilities prior to their formulation into a medicine. Surface activity and surfactants-the role of surfactants in medicines and adsorption in pharmaceutical products. Rheological flow characteristics (performance) of liquids and semi-solids. Drug stability and degradation-reaction kinetics, rate constants; effect of environmental factors; shelf-life.

Module Delivery

This is a lecture based module supplemented with formative quizzes, tutorials, practical laboratory classes and guided reading.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	70	N/A
Non-Contact Hours	230	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	300	N/A
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Examination	Weighting:	60%	Outcomes Assessed:	1, 2
Description:	Closed book written examination				

Component 2

Type:	Coursework	Weighting:	40%	Outcomes Assessed:	3
Description:	Assessment of practical work				

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

Component 1 (EX1) comprises 60% of the module grade. A minimum of a Grade D or better is required to pass this assessment. Component 2 (CW1) comprises 40% of the module grade. A minimum of a Grade D or better is required to pass this assessment. Overall Grade D or better is required to pass this module. Non-submission of either component will result in an NS grade for the module.

		Examination:						NS
		A	B	C	D	E	F	
Coursework:	A	A	B	B	C	E	E	
	B	A	B	C	C	E	E	
	C	B	B	C	D	E	E	
	D	B	C	C	D	E	F	
	E	E	E	E	E	E	F	
	F	E	E	E	E	F	F	
NS		Non-submission of work by published deadline or non-attendance for examination						

Module Requirements

Prerequisites for Module	None, in addition to course requirements.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

- 1 DENTON, P. and ROSTRON, C., 2013. *Pharmaceutics: the science of medicine design*. First Edition. Oxford: Oxford University Press.
- 2 FLORENCE, A.T. and ATTWOOD, D., 2016. *Physicochemical Principles of Pharmacy*. Sixth Edition. London: Pharmaceutical Press.
- 3 AULTON, M.E. ed., 2022. *Aulton's Pharmaceutics: The Design and Manufacture of Medicines*. Sixth Edition. Edinburgh: Churchill Livingstone.
- 4 CAIRNS, D., 2012. *Essentials of Pharmaceutical Chemistry*. Fourth Edition. London: Pharmaceutical Press.
- 5 ATTWOOD, D. and FLORENCE, A.T., 2012. *Physical Pharmacy*. Second Edition. London: Pharmaceutical Press.
- 6 GAISFORD, S. and SAUNDERS, M., 2012. *Essentials of Pharmaceutical Preformulation*. First Edition. Hoboken: Wiley-Blackwell.