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## MODULE DESCRIPTOR

### Module Title

Foundations in Medicine Design

Reference	PH1136	Version	2
Created	September 2018	SCQF Level	SCQF 7
Approved	July 2017	SCQF Points	30
Amended	September 2018	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 and apply mathematical expressions in relation to chemical and pharmaceutical systems.
- 2 Show understanding of the techniques used to generate qualitative and quantitative experimental data and demonstrate data analysis and handling.
- 3 Demonstrate basic laboratory skills.

### 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	107	N/A
Non-Contact Hours	193	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	300	N/A
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

**ASSESSMENT PLAN**

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

**Component 1**

Type:	Examination	Weighting:	100%	Outcomes Assessed:	1
Description:	Closed book written examination				

**Component 2**

Type:	Coursework	Weighting:	0%	Outcomes Assessed:	2
Description:	Completion of the coursework content.				

**Component 3**

Type:	Practical Exam	Weighting:	0%	Outcomes Assessed:	3
Description:	Laboratory skills competency test.				

**MODULE PERFORMANCE DESCRIPTOR****Explanatory Text**

To pass this module, the student MUST achieve a module Grade of Grade D or better.

Module Grade	Minimum Requirements to achieve Module Grade:
<b>A</b>	When the mark for C1 is 70% or more and a Pass in C2 and C3.
<b>B</b>	When the mark for C1 is 60-69% and a Pass in C2 and C3.
<b>C</b>	When the mark for C1 is 50-59% and a Pass in C2 and C3.
<b>D</b>	When the mark for C1 is 40-49% and a Pass in C2 and C3.
<b>E</b>	When the mark for C1 is 35-39% and a Pass in C2 and C3.
<b>F</b>	When the mark for C1 is less than 35% and/or an unsuccessful attempt (i.e. Fail) in C2 and/or C3.
<b>NS</b>	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. *Pharmaceutics: the science of medicine design*. Current Edition. Oxford University Press.
- 2 FLORENCE, A.T. and ATTWOOD, D. *Physicochemical Principles of Pharmacy*. Current Edition. London: Pharmaceutical Press.
- 3 AULTON, M.E. ed. *Aulton's Pharmaceutics: The Design and Manufacture of Medicines*. Current Edition. Edinburgh: Churchill Livingstone.
- 4 CAIRNS, D. *Essentials of Pharmaceutical Chemistry*. Current Edition. London: Pharmaceutical Press.
- 5 ATTWOOD, D. and FLORENCE, A.T. *Physical Pharmacy*. Current Edition. London: Pharmaceutical Press. (Fasttrack)
- 6 GAISFORD, S. and SAUNDERS, M. *Essentials of Pharmaceutical Preformulation*. Current Edition. Wiley-Blackwell.