**SECTION 1: MODULE SPECIFICATIONS**

1. Title of the module

**Medicines Design and Manufacture 1 (MDM1)**

1. School which will be responsible for management of the module

**Medway School of Pharmacy**

1. Start date of the module

**September 2011**

1. The cohort of students (onwards) to which the module will be applicable

**September 2011 entrants and September 2010 Foundation Degree entrants**

1. The number of students expected to take the module

**200**

1. Modules to be withdrawn on the introduction of this proposed module and consultation with other relevant Schools and Faculties regarding the withdrawal

**None**

1. Level of the module *(e.g. Certificate [C], Intermediate [I], Honours [H] or Postgraduate [M])*

**Certificate (C)**

1. The number of credits which the module represents

**30 credits**

1. Which term(s) the module is to be taught in (or other teaching pattern)

**Terms 1 and 2**

1. Prerequisite and co-requisite modules

**C1 [September 2010 Foundation Degree entrants]**

1. The programme(s) of study to which the module contributes

**MPharm [Master of Pharmacy]**

1. The intended subject specific learning outcomes and, as appropriate, their relationship to programme learning outcomes

**Aims**

The aim of the module is to provide students with a detailed knowledge and understanding of certain aspects of pharmaceutical chemistry and pharmaceutics which relate to the synthesis, pharmacological activity and formulation of drugs. This will provide the underpinning knowledge necessary to understand the medicinal chemistry and pharmaceutics covered in the remaining ‘Medicinal Products’ (MDM2-4) modules. In addition this module will provide essential background for understanding the mechanism of drug action and the chemical origins of toxicity covered within the ‘Patient, Disease and Drug Action’ (PDDA) modules.

**Learning Outcomes**

On successful completion of this module, students will have demonstrated:

1. a basic understanding of bonding, functional group chemistry and fundamental reaction mechanisms in organic chemistry and an ability to relate this to the interactions between drugs and biomolecules (**PO2, PO7, PO8, PO12, PO38, PO40, PO50).**
2. an understanding of the importance of drug stereochemistry and an ability to apply the principles of chirality to the activity and metabolism of drugs (**PO4, PO50, PO38, PO40).**
3. an ability to relate the molecular structure of simple organic molecules and drugs to their physicochemical properties (**PO4, PO12, PO38, PO40, PO50).**
4. knowledge and understanding of selected theories and applications of physical chemistry such as thermodynamics, kinetics and spectroscopic and volumetric analytical methods (**PO2, PO3, PO11, PO12, PO38, PO40, PO50).**
5. an understanding of the physicochemical properties and behaviour of drug molecules (**PO4, PO12, PO38, PO40, PO50).**
6. an ability to explain the principles and practice of preformulation concepts in pharmaceutical formulation design (**PO7, PO8, PO38, PO40, PO50).**
7. an ability to describe the main types of dosage forms (**PO7, PO8, PO38, PO40, PO50).**
8. practical laboratory skills and an ability to present, evaluate and interpret data derived from these sessions (**PO3, PO41-43, PO48, PO49, PO50, PO52, PO53, PO55).**
9. The intended generic learning outcomes and, as appropriate, their relationship to programme learning outcomes

* An ability to work and communicate effectively (**PO57, PO58)**
* An ability to problem-solve relative to quantitative data, calculations and numeracy including correct use of units and modes of data presentation (**PO59, PO60).**
* An ability to obtain, transform and critically evaluate quantitative data (**PO61).**
* An ability to accurately retrieve and understand information (**PO62, PO63, PO65).**
* Time management and organisational skills (**PO64, PO65).**
* An understanding of the accepted ethical principles involved in the collection, use and interpretation of scientific data (**PO70).**

1. A synopsis of the curriculum

**Organic chemistry**

* Atomic structure, bonding and molecular structure
* Introduction to mechanistic principles
* Organic functional groups and their physicochemical properties
* Drug stereochemistry
* Introduction to spectroscopic methods in drug analysis

**Physical chemistry**

* Basic thermodynamics
* Kinetics and rates of chemical reactions
* Ions in solution
* Physicochemical properties of drugs in solution
* Buffers, acids and bases

**Pharmaceutics**

* Preformulation
* Flow properties
* Mixing
* Routes of drug administration and introduction to dosage from design

1. Indicative Reading List

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ISBN Number** | **Author** | **Date** | **Title** | **Publisher** |
| **0534420052**  **9780495116288** | McMurry, J. | 2007 | Organic Chemistry, 6th, 7th Int. Ed. | Brooks Cole |
| **061870695X\*\*** | Ebbing, D. D. | 2006 | General Chemistry, 8th Rev. Ed. | H Mifflin |
| **0443101086 \*** | Aulton, M.E. | 2007 | Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 3rd Ed. | Churchill Livingstone |
| **085369608X \*** | Florence, A.T. & Attwood, D. | 2005 | Physicochemical Principles of Pharmacy | Pharmaceutical Press |

1. Learning and Teaching Methods, including the nature and number of contact hours and the total study hours which will be expected of students, and how these relate to achievement of the intended learning outcomes

**Summary of Learning and Teaching Activities**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Lecture** | **Practical/**  **Workshop** | **MSCL/ CAL** | **Seminars** | **Private Study** | **Formal assessment** | **Total hours** |
| 45 | 45 | 90 | 12 | 105 | 1 x 3 hour exam | 300 |

**Directed Learning and Teaching Activities**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Activity** | **Lectures** | **Practical/**  **Workshop** | **MSCL/CAL** | **Total hours** |
| Organic Pharmaceutical Chemistry | 15 | 3 × 3h  2 × 3h | 30 | **60** |
| Physical Pharmaceutical Chemistry | 15 | 3 × 3h  2 × 3h | 30 | **60** |
| Pharmaceutics | 15 | 4 × 3h  1 × 3h | 30 | **60** |
| Seminars |  | | | **12** |
| Formal assessment |  | | | **3h exam** |
| **Total hours** | **45** | **45** | **90** | **195** |

**Lectures:** The 45 lectures are intended for the introduction of key new materials which are essential to achieve the learning outcomes (LO1-7).

**Practicals:** Serve to give students practical experience on important concepts and to reinforce and expand their knowledge base in key areas (LO1-8).

**Workshops:** Gives students an opportunity to apply their knowledge to solve problems. It also serves as an opportunity for group discussion of difficult concepts (LO1-7).

**MSCLs:** This forms part of the student’s self directed learning and serves to reinforce materials introduced in lectures and practical sessions (LO1-7).

**Revision Seminars:** These are timetabled at the end of the teaching period in Term 2 and helps students consolidate the materials taught in the academic year. It also serves as a forum for students to raise and discuss key concepts presented in the module (LO1-8).

1. Assessment methods and how these relate to testing achievement of the intended learning outcomes

|  |  |  |  |
| --- | --- | --- | --- |
| **Methods of assessment** | **Learning outcomes assessed** | **Weighting** | **Outline details** |
| **Continuous assessment** | 8 | 40% | Written report of a selected laboratory (50%) |
|  | 1-7 |  | Interim assessments (50%) |
|  | 1-8 | **PASS required** | Satisfactory attendance and performance at all scheduled coursework sessions (workshops, laboratories and seminars) \* |
| **Examination** | 1-7 | 60% | 3 hour Examination |

**Coursework (40%)**

The coursework comprises of a written report of a selected laboratory and a multiple choice question (MCQ) based interim assessment. The laboratory reports will serve to enhance students report written communication skills and improve their ability to present, evaluate and interpret data derived from practical sessions (LO1-8) and (PO40, PO41, PO43, PO57, PO59-64). Multiple Choice Question (MCQ) based interim assessment is broad based and will assess (LO 1-7).

**Examination (60%)**

All the learning outcomes are assessed by a written examination at the end of the academic year. This ensures assessment of core concepts in medicines design and manufacture 1 preparing students for higher level study (LO1-8) and (PO38, PO40, PO59, PO60, PO64).

**Pass mark**

The pass mark for this module is 40% overall. Satisfactory attendance and performance at all scheduled coursework sessions is required. This is defined as a minimum of 80% attendance at all classes excluding lectures. In addition, lab books, pre-lab assignments and seminar worksheets must be maintained to the required standard.

1. Implications for learning resources, including staff, library, IT and space

The course has been taught since 2007 and therefore library and learning resources are in place.

1. **The School/Collaborative Partner *(delete as applicable)* recognises and has embedded the expectations of current disability equality legislation, and supports students with a declared disability or special educational need in its teaching. Within this module we will make reasonable adjustments wherever necessary, including additional or substitute materials, teaching modes or assessment methods for students who have declared and discussed their learning support needs. Arrangements for students with declared disabilities will be made on an individual basis, in consultation with the University’s/Collaborative Partner’s *(delete as applicable)* disability/dyslexia support service, and specialist support will be provided where needed.**

***If the module is part of a programme in a Partner College or Validated Institution, please complete the following:***

1. Partner College/Validated Institution:
2. University School (for cognate programmes) or Faculty (for non-cognate programmes) responsible for the programme:√

**SECTION 2: MODULE IS PART OF A PROGRAMME OF STUDY IN A UNIVERSITY SCHOOL**

**Statement by the School Director of Learning and Teaching/School Director of Graduate Studies (as appropriate):** "I confirm I have been consulted on the above module proposal and have given advice on the correct procedures and required content of module proposals"

|  |  |
| --- | --- |
| ................................................................  Director of Learning and Teaching/Director of Graduate Studies (delete as applicable)  …………………………………………………  Print Name | ..............................................  Date |

**Statement by the Head of School:** "I confirm that the School has approved the introduction of the module and, where the module is proposed by School staff, will be responsible for its resourcing"

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| --- | --- |
| .................................................................  Head of School  …………………………………………………….  Print Name | ..............................................  Date |

Module Specification Template  
Last updated July 2010