UNIVERSITI TEKNOLOGI MARA

CMT667: MEDICINAL CHEMISTRY

Course Name (English)	MEDICINAL CHEMISTRY APPROVED
Course Code	CMT667
MQF Credit	3
Course Description	This medicinal chemistry course is aimed at providing students some insight of processes involved drug design and discovery. This course explains the underlying connection between chemistry and pharmacology that is involved in design, development and interaction of drugs in the human body. It provide an understanding of current drug targets and how novel, pharmacologically active molecules are discovered and designed to cure diseases based on the modulation of these targets. This course will also cover on current trends in drug design that includes pharmacokinetic oriented and in-silico drug design.
Transferable Skills	The students should be able to analyze and solve problems related to drug design. Students get familiarized with terminologies that are often used in drug and pharmaceutical industries. Students are also exposed to computer software and applications for drug design purposes.
Teaching Methodologies	Lectures, Presentation
CLO	CLO1 Explain on various aspects of medicinal chemistry involving drug targets, pharmacokinetics, drug design, synthetic pathways, and biological testing CLO2 Present on ligand-target interactions, pharmacokinetics, and biological aspects of commercially available drugs. CLO3 Devise a strategy or approach in designing drugs for various targets.
Pre-Requisite Courses	No course recommendations

Topics
1. Introduction 1.1) Introduction to medicinal chemistry 1.2) From concept to market
2. Drug Target 2.1) Enzymes, Receptors and Nucleic acid as potential drug targets 2.2) Miscellaneous drug targets and their functions
3. Pharmacokinetics 3.1) Drug administration, absorption, metabolism, distribution and excretion 3.2) Pharmacokinetic considerations in drug design and development
4. Biological testing and bioassays 4.1) Drugs testing 4.2) Testing drugs for in vitro assays 4.3) Testing drugs for in vivo assays
5. Drug discovery 5.1) Lead compounds 5.2) Natural sources of lead compounds 5.3) Synthetic sources of lead compounds
6. Synthesis 6.1) Synthetic approaches in medicinal chemistry 6.2) Synthesis and structural modification of privileged scaffold in medicinal chemistry 6.3) Retrosynthetic analysis 6.4) Importance of stereochemistry in drug design and action

7. Structure-Activity Relationship 7.1) Definition of structure-activity relationship 7.2) Binding interactions 7.3) Functional group as binding groups 7.4) Quantitative structure-activity relationships 7.5) Pharmacophore
8. Target oriented drug design 8.1) Computer aided drug design 8.2) Simplification of complex molecules 8.3) Conformational restraint 8.4) Extra binding interactions

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	Prepare an assignment to describe the strategy used to design drugs for a particular target.	15%	CLO3
Presentation	Presentation on aspects of drug design for commercially available drugs.	15%	CLO2
Test	Introduction, Drug Target, Pharmacokinetics, Biological testing and bioassays Drug discovery	30%	CLO1

Reading List

Recommended Text

- **Graham L. Patrick 2017, *An Introduction to Medicinal Chemistry*, 6 Ed., 26, Oxford University Press United Kingdom [ISBN: 9780198749691]**

Article/Paper List

This Course does not have any article/paper resources

Other References

- **n/a Graham L. Patrick 2015, *An Introduction to Drug Synthesis*, Oxford University Press, United Kingdom**
- **n/a Stefan Bräse 2015, *Privileged Scaffolds in Medicinal Chemistry: Design, Synthesis, Evaluation* , Royal Society of Chemistry, United Kingdom**