



UNIVERSITI TEKNOLOGI MARA

CMT595: NATURAL PRODUCT CHEMISTRY AND TECHNOLOGY

<b>Course Name (English)</b>	NATURAL PRODUCT CHEMISTRY AND TECHNOLOGY <b>APPROVED</b>
<b>Course Code</b>	CMT595
<b>MQF Credit</b>	2
<b>Course Description</b>	This course will interactively engage the students cognitively and scientifically in the areas of natural product chemistry including definition of natural products, metabolism, and their classes. The students will be exposed to natural products approach to drug discovery including sampling, vouchering, extraction and isolation of secondary metabolites from natural products. The outcomes shall be assessed through a variety of tools which include the traditional paper examination (tests and final examination), classroom engagement like student presentation and case study report
<b>Transferable Skills</b>	Knowledge on plant chemistry and its application in herbal industry and drug discovery.
<b>Teaching Methodologies</b>	Lectures, Case Study, Discussion, Presentation, Journal/Article Critique
<b>CLO</b>	CLO1 Explain the definition of natural products and their classes, and the technique of extraction, isolation of secondary metabolites, and their application in natural product approach of drug discovery CLO2 Analyze the case studies of discovery, identification and mass production of important bioactive secondary metabolites CLO3 Present the analysis on current development in natural product chemistry and technology
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Introduction to Natural Product Chemistry</b> 1.1) Definition 1.2) Primary metabolism 1.3) Secondary metabolism 1.4) Sources of natural products 1.5) Ethnobotany and traditional uses of natural products	
<b>2. Classification of Natural Products</b> 2.1) Introduction 2.2) Terpenes 2.3) Alkaloids 2.4) Flavonoids 2.5) Other compounds	
<b>3. Extraction, isolation and characterization of natural products</b> 3.1) Collection, storage and vouchering of plant samples 3.2) Extraction and pretreatment of plant samples 3.3) Detection methods for secondary metabolites 3.4) Isolation of natural products 3.5) Characterization of natural products	
<b>4. Natural products approach to drug discovery</b> 4.1) Drug development from natural products 4.2) Plant cell biotechnology 4.3) Biocatalysis as a tool of natural product production 4.4) Herbal Analysis 4.5) Metabolomics	

**5. Case studies**

- 5.1) Anticancer drugs
- 5.2) Antimalarial drug
- 5.3) Antibacterial drug
- 5.4) Botanical drug
- 5.5) Others

Assessment Breakdown	%
Continuous Assessment	100.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Case Study	Case study on selected plants	20%	CLO2
	Presentation	Present on development of natural products chemistry and technology	10%	CLO3
	Quiz	Quiz 2	10%	CLO1
	Quiz	Quiz 3	10%	CLO1
	Quiz	Quiz 1	10%	CLO1
	Test	Test 1	20%	CLO1
	Test	Test 2	20%	CLO1

Reading List	Recommended Text	<ul style="list-style-type: none"> <li>Leland J. Cseke, Ara Kirakosyan, Peter B. Kaufman, Sara Warber, James A. Duke, Harry L. Brielmann 2006, <i>Natural Products from Plants</i>, Second Ed., CRC Press New York</li> <li>Raymond Cooper, George Nicola 2014, <i>Natural Products Chemistry: Sources, Separations and Structures</i>, CRC Press New York</li> <li>Molina, G., Pelissari, F. M., Pessoa, M. G., &amp; Pastore, G. M. 2015, <i>Bioactive compounds obtained through biotechnology. In Biotechnology of Bioactive Compounds</i>, Wiley and Sons</li> </ul>
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	