



UNIVERSITI TEKNOLOGI MARA

CMT655: OILS AND FATS CHEMISTRY AND TECHNOLOGY

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| Course Name (English) | OILS AND FATS CHEMISTRY AND TECHNOLOGY APPROVED |
| Course Code | CMT655 |
| MQF Credit | 3 |
| Course Description | Oleochemicals are made from vegetable oil and animal fats feedstocks. They range from fatty acids, glycerine, alcohols and metallic soaps to fatty nitriles and their derivatives. This course is designed to provide the foundation for various processes involve in oleochemistry. It covers the formation of basic oleochemicals such as Fatty Acids, Fatty Acid Methyl Esters (FAME), Fatty Alcohols, Fatty Amines and glycerol via various chemical reactions. It also includes the production of upstream chemical products derived from oleochemical feedstocks. The applications of oleochemicals products is also discussed which may include a visit to the oleochemical-related organization in Klang Valley. |
| Transferable Skills | The knowledge and importance of basic oleochemicals and its derivatives in industries |
| Teaching Methodologies | Lectures, Presentation |
| CLO | CLO1 Explain the source, physical and chemical properties of fats and oils CLO2 Discuss the production, modification and application of fats and oils in industries CLO3 Demonstrate the ability to communicate effectively through presentation on fats and oils-related industries CLO4 Write a scientific report on fats and oils-related industries |
| Pre-Requisite Courses | No course recommendations |
| Topics | |
| 1. Introduction to oleochemistry 1.1) Lipids: classification, sources, physicochemical properties and functional properties of oil/ fats 1.2) Application of oleochemistry | |
| 2. Fatty acids and derivatives 2.1) Types and structures of fatty acids and its derivatives 2.2) Fatty Acid Methyl Esters: introduction, production, applications 2.3) Fatty alcohols: introduction, production, applications 2.4) Fatty amines: introduction, production, applications | |
| 3. Glycerol 3.1) Introduction 3.2) Production 3.3) Applications | |
| 4. Pre-treatment and fat splitting of fatty acids 4.1) Pre-treatment of fatty acids: Refining, Degumming, Neutralization, Bleaching and Deodorization 4.2) Fat splitting: Twitchell, Batch Autoclave, Continuous and Enzymatic processes | |
| 5. Oil modification processes 5.1) Hydrogenation 5.2) Interesterification 5.3) Fractionation | |
| 6. Application of oils and fats in food industry 6.1) Margarine and butter 6.2) Edible oil 6.3) Food-grade surfactants | |

7. Application of oils and fats in non-food industry

- 7.1) Soaps and detergents
- 7.2) Personal care and pharmaceutical products
- 7.3) Biofuel and lubricants

8. Application of palm oil in food and non-food industries

- 8.1) Specialty products produced from palm oil

| Assessment Breakdown | % |
|-----------------------|--------|
| Continuous Assessment | 60.00% |
| Final Assessment | 40.00% |

| Details of Continuous Assessment | Assessment Type | Assessment Description | % of Total Mark | CLO |
|----------------------------------|-----------------|--|-----------------|------|
| | Assignment | Prepare a group presentation in the form of poster on fats and oils-related industries - Topic 8 | 15% | CLO3 |
| | Assignment | Prepare a scientific report in the form of poster on fats and oils-related industries - Topic 8 | 15% | CLO4 |
| | Test | Test - 30% of the overall assessment - Topics 1, 2, 3 | 30% | CLO1 |

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| Reading List | Reference Book Resources | <ul style="list-style-type: none"> F. D. Gunstone 2004, <i>The Chemistry of Oils and Fats</i>, Taylor & Francis US [ISBN: 1405116269] Richard John Hamilton, A. Bhati 1980, <i>Fats and Oils</i>, Elsevier Science Limited [ISBN: 0853349150] |
| Article/Paper List | This Course does not have any article/paper resources | |
| Other References | This Course does not have any other resources | |