



## UNIVERSITI TEKNOLOGI MARA

### FST306: FOOD ANALYSIS

<b>Course Name (English)</b>	FOOD ANALYSIS <b>APPROVED</b>
<b>Course Code</b>	FST306
<b>MQF Credit</b>	4
<b>Course Description</b>	This course covers the basic properties of moisture, protein, carbohydrate, lipids, ash, fibre and vitamin and their roles in food system. The principle and applications of physical, chemical and instrumental methods for the qualitative and quantitative analyses of moisture, protein, carbohydrate, lipids, ash and fibre will also be covered. Students will perform experiments to determine major food components using physical, chemical and instrumental methods.
<b>Transferable Skills</b>	Expert in field
<b>Teaching Methodologies</b>	Lectures, Lab Work, Discussion
<b>CLO</b>	CLO1 Apply the principles and procedure of physical, chemical and instrumental analysis of selected food components. CLO2 Display qualitative and quantitative analysis of food components using physical, chemical and instrumental methods. CLO3 Describe the principles and procedure of selected food components based on qualitative and quantitative analyses.
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Introduction</b> 1.1) 1.1 Sampling techniques and sample preparation 1.2) 1.2 Precision, accuracy, repeatability and reproducibility	
<b>2. Moisture</b> 2.1) 2.1 Importance of moisture determination 2.2) 2.2 Sample preparation 2.3) 2.3 Moisture determination by direct and indirect method (physical and chemical method)	
<b>3. Crude Fat</b> 3.1) 3.1 Importance of crude fat determination 3.2) 3.2 Sample preparation 3.3) 3.3 Crude fat determination by solvent and non- solvent extraction methods	
<b>4. Protein</b> 4.1) 4.1 Importance of crude protein determination 4.2) 4.2 Sample preparation 4.3) 4.3 Crude protein determination by chemical methods	
<b>5. Carbohydrate</b> 5.1) 5.1 Importance of carbohydrate determination 5.2) 5.2 Sample preparation 5.3) 5.3 Carbohydrates determination by chemical and physical methods	
<b>6. Fibre</b> 6.1) 6.1 Importance of fibre determination 6.2) 6.2 Sample preparation 6.3) 6.3 Determination of crude and dietary fibre by chemical methods	
<b>7. Ash and minerals</b> 7.1) 7.1 Importance of ash and mineral determination 7.2) 7.2 Sample preparation 7.3) 7.3 Determination of ash and mineral by physical and chemicals methods	

**8. Vitamins**

- 8.1) 8.1 importance of vitamins determinations
- 8.2) 8.2 Sample preparation
- 8.3) 8.3 Vitamin determination

**9. Spectroscopy**

- 9.1) 9.1 Basic principle
- 9.2) 9.2 Molecular spectroscopy
- 9.3) 9.2.1 UV-Visible: Instrumentation and applications
- 9.4) 9.3 Atomic spectroscopy
- 9.5) 9.3.1 AAS: instrumentation and applications

**10. Chromatography**

- 10.1) 10.1 Types of chromatography
- 10.2) 10.2 Gas Chromatography
- 10.3) 10.2.1 Principle, instrumentation and applications
- 10.4) 10.3 High Performance Liquid Chromatography
- 10.5) 10.3.1 Principle, instrumentation and applications

Assessment Breakdown	%
Continuous Assessment	70.00%
Final Assessment	30.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Group Project	One (1) Group assignment works related to the principles, procedure and application of food analysis	20%	CLO3
	Test	TEST cover topics Introduction, Moisture, Crude fat, protein and Carbohydrate	20%	CLO1
	Written Report	Lab assessment on concepts and theories in food analysis.	30%	CLO2

Reading List	<p><b>Reference Book Resources</b></p> <ul style="list-style-type: none"> <li>• Ball, G. M 2006, <i>Vitamins in foods: Analysis, bioavailability</i> , CRC/Taylor &amp; Francis</li> <li>• Birch, G. G 1985, <i>Analysis of Carbohydrate</i>, Elsevier Applied Science</li> <li>• Hamilton, R. J 1998, <i>Lipid Analysis in Oils and Fats</i>, Blackie</li> <li>• James, C. S. 1999, <i>Analytical Chemistry of Foods</i>, Aspen Publishers, Inc., Maryland</li> <li>• Leo, M. L. Nollet 2004, <i>Handbook of Food Analysis</i>, 2nd. ed. Marcel &amp; Dekker</li> <li>• Nielsen, S. S 1998, <i>Introduction to Chemical Analysis of Foods</i>, 2nd. ed. Jones and Bartlett Pub</li> <li>• Pomeranz, Y. and Meloan, C. E 2000, <i>Food Analysis Theory and Practice</i>, 4th.ed Chapman &amp; Hall Inc.</li> <li>• Susan S. C. and Mark, L. D 2001, <i>Handbook of Dietary Fibre</i>, Food Science &amp; Technology</li> </ul>
Article/Paper List	This Course does not have any article/paper resources
Other References	<ul style="list-style-type: none"> <li>• Reference Aishah Bujang, Fadhilah Jailani, Norizzah Abd Rashid, Halimahton Zahrah Mohamed Som 2011, <i>Food Analysis Laboratory Manual</i>, UiTM Press, Universiti Teknologi MARA, Shah Alam</li> </ul>