

## AGRI S7018: The Science of Food

Module Details	
Module Code:	AGRI S7018
Full Title:	The Science of Food <b>APPROVED</b>
Valid From::	Semester 2 - 2021/22 ( January 2022 )
Language of Instruction:	English
Duration:	1 Semester
Credits::	5
Module Owner::	<ul style="list-style-type: none"><li>• Breda Brennan</li><li>• Joe McKeever</li></ul>
Departments:	Unknown
Module Description:	This module aims to give the student background information in relation to the micro & macro nutrients which are available from various food products and give a background into the requirements of food production. It will also equip the student with the necessary information to enable them to perform physical, chemical and microbiological food analysis. The student will be able to demonstrate knowledge of traditional methods of analysis techniques encountered in industry. Teaching and Learning Strategy: Blended and flexible learning will be used throughout. This will take the form of face to face lectures and interactive practical sessions and demonstrations.

Module Learning Outcome	
On successful completion of this module the learner will be able to:	
#	Module Learning Outcome Description
MLO1	Apply the general features and importance of proteins, lipids and carbohydrates in food processing.
MLO2	Elaborate on the importance of sustainability, food processing, food preservation and unit of operations/production in relation to the production of food products.
MLO3	Distinguish between qualitative and quantitative microbiological and chemical methods for testing the quality of food products.
MLO4	Perform some traditional compositional food analysis and analyse the laboratory data.
Pre-requisite learning	
Module Recommendations	
<p><i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named DkIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i></p>	
No recommendations listed	

Module Indicative Content
<b>Constituents of Foods: Properties &amp; Significance</b> Carbohydrates: Properties of sugars, starches, cellulose and hemicellulose, pectins & carbohydrate gums. Proteins. Fats & Oils. Additional food constituents: Natural Emulsifiers, analogs & new ingredients, organic acids, oxidants and antioxidants, enzymes, pigments and colours, natural toxicants, water.
<b>Nutritive Aspects of Food Constituents</b> Food & Energy: Calories. Additional Roles of carbohydrates, proteins, and fats in nutrition. Protein quality, bioavailability of nutrients, vitamins: Vit A, D, E etc. Daily allowances & Insufficiency. Minerals: Calcium, phosphorus, magnesium etc. Fiber, water, stability of nutrients. Diet & Chronic Disease
<b>Food Deterioration and its Control</b> Shelf life & dating of foods. Major causes of food deterioration. Principles of Food Preservation. Control of Microorganisms. Control of enzymes & other factors
<b>Introduction to Food Processing &amp; Unit Operations</b> Why do we process? Common Unit Operations. Link to food spoilage and preservation. Food Hygiene: Link to conditions for MO growth, infection of food, hygiene in food production. Food storage: Storage guidelines
<b>Introduction to Traditional Chemical Analysis</b> Define qualitative & quantitative analysis, precision & accuracy etc. Sampling and sample plans. Principles of classical techniques used in food analysis: Titrimetric analysis, Gravimetric procedures, Solvent extraction methods, Refractometry, Polarimetry
<b>PRACTICALS:- Constituent Chemical &amp; Microbiological Analysis of Foods</b> Constituent Analysis of Food & Beverages using some of the following techniques; titrations, gravimetric analysis, organoleptic analysis, membrane etc

Module Assessment	
Assessment Breakdown	%
Course Work	30.00%
Practical	20.00%
Final Examination	50.00%
Module Special Regulation	

## Assessments

Part Time On Campus			
Course Work			
<b>Assessment Type</b>	Presentation	<b>% of Total Mark</b>	30
<b>Marks Out Of</b>	0	<b>Pass Mark</b>	0
<b>Timing</b>	S1 Week 5	<b>Learning Outcome</b>	1,2
<b>Duration in minutes</b>	0		
<b>Assessment Description</b> Investigate sustainability in relation to the production of nutritious food products/raw materials.			
No Project			
Practical			
<b>Assessment Type</b>	Practical/Skills Evaluation	<b>% of Total Mark</b>	20
<b>Marks Out Of</b>	0	<b>Pass Mark</b>	0
<b>Timing</b>	n/a	<b>Learning Outcome</b>	1,2,3,4
<b>Duration in minutes</b>	0		
<b>Assessment Description</b> Students will complete a laboratory based activity. On completion of the activity, the students will prepare a report/presentation/test on the methods used and the results generated.			
Final Examination			
<b>Assessment Type</b>	Formal Exam	<b>% of Total Mark</b>	50
<b>Marks Out Of</b>	0	<b>Pass Mark</b>	0
<b>Timing</b>	End-of-Semester	<b>Learning Outcome</b>	1,2,3
<b>Duration in minutes</b>	0		
<b>Assessment Description</b> CA Assessment: Evaluate/Assess the knowledge and understanding gained in lectures.			
Reassessment Requirement			
<b>A repeat examination</b> Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.			
<b>Reassessment Description</b> Resubmit assignments/ reattend practical if necessary/ repeat exam as decided by the Exam Board.			

## Module Workload

This module has no Full Time On Campus workload.

### Workload: Part Time On Campus

Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Face to Face	Every Week	1.00	1
Lecture	Contact	Online lecture	Every Week	1.00	1
Online Contact	Contact	Online supported activity	Every Week	0.50	0.5
Practical	Contact	Students will attend a practical session in microbiological or chemical analysis of food	Every Week	0.50	0.5
Independent Study	Non Contact	Revision of theory and directed reading	Every Week	2.00	2
Directed Reading	Non Contact	No Description	Every Week	2.00	2
				Total Weekly Learner Workload	7.00
				Total Weekly Contact Hours	3.00

## Module Resources

### Recommended Book Resources

Stephanie Clark. (2014), Food Processing, John Wiley & Sons, p.592, [ISBN: 9780470671146].  
Potter, N., Hotchkiss, J. (1995), Food Science, 5th. Chapman & Hall, [ISBN: 0-412-06451-0].  
Campbell-Platt, G.. (2009), Food Science & Technology, 1st. Wiley-Blackwell, [ISBN: 978-0-632-064].  
S. Suzanne Nielsen. (2017), Food Analysis, 4th. Springer, p.649, [ISBN: 978-3-319-45776-5].  
Ray, B., Bhuna, A. (2007), Fundamental Food Microbiology, 4th. CRC Press, [ISBN: 978-084937529].

*This module does not have any article/paper resources*

### Other Resources

Website, FSAI – The Food Safety Authority of Ireland,  
<http://www.fsai.ie>