

## AGRI S7014: Crop and Forage Science

Module Details	
Module Code:	AGRI S7014
Full Title:	Crop and Forage Science APPROVED
Valid From::	Semester 1 - 2021/22 ( September 2021 )
Language of Instruction:	English
Duration:	1 Semester
Credits::	5
Module Owner::	Joseph Lynch
Departments:	Agriculture, Food and Animal Health
Module Description:	This module explores the scientific principles that underpin the interaction between plants, crop inputs and the environment in primary production, and details the application of these principles in modern and emerging sustainable grass and crop production systems.

Module Learning Outcome	
On successful completion of this module the learner will be able to:	
#	Module Learning Outcome Description
MLO1	Detail and monitor the critical yield-limiting stages of growth for commonly sown grasses, forages and field crops.
MLO2	Explain the diversity in mechanisms of common plant protection products and evaluate their functions in an effective and sustainable Integrated Pest Management plan in arable land and grassland.
MLO3	Discuss methods to improve nutrient use efficiency in grass and crop production systems and their contributions to sustainable production systems.
MLO4	Appraise pre- and post-harvest and grazing technologies in relation to potential benefits to yield, production efficiency and profitability.
MLO5	Develop skills in variety selection and utilising data to support crop husbandry and grass management decisions.
Pre-requisite learning	
<b>Module Recommendations</b> <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>	
No recommendations listed	

Module Indicative Content
<b>Agronomy and Yield Formation</b> Plant physiology, planting material, germination, sink and source limitation, fertilisation and yield formation in the primary plants grown in the Irish agricultural sector.
<b>Nutrient Management</b> Soil physical, chemical and biological health, chemical fertilisers and application splitting, multi-species swards, cover crops/green manures, protected fertilisers, organic manures.
<b>Integrated Pest Management</b> Pesticide mode of action, pesticide resistance in pathogens and weeds, determining pesticide application rates, legislation for the sustainable use of plant protection products, crop rotation, variety selection, crop hygiene, residue management, biological and microbial plant protection products
<b>Plant Pathology</b> Disease monitoring, pathogen life cycles, reproduction and dispersal mechanisms of fungi, viruses and bacteria.
<b>Pre- and Post-Harvest Emerging Technologies</b> Grass cover determination, grass and crop yield prediction models, remote imaging, biological additives, silage inoculants, meteorological data, pathogen identification.

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

## Assessments

Part Time On Campus			
No Course Work			
Project			
Assessment Type	Project	% of Total Mark	30
Marks Out Of	100	Pass Mark	40
Timing	S1 Week 11	Learning Outcome	4
Duration in minutes	0		
<b>Assessment Description</b> An investigation into the feasibility of integrating a recently developed scientific technology into a conventional crop or grass production system (e.g. yield estimation/monitoring, additives, sensors etc.)			
Practical			
Assessment Type	Practical/Skills Evaluation	% of Total Mark	20
Marks Out Of	100	Pass Mark	40
Timing	S1 Week 5	Learning Outcome	2,5
Duration in minutes	0		
<b>Assessment Description</b> Practicals focused on the use of yield monitoring and IPM techniques in grass and crop production systems, including grass cover measuring, pest identification, variety selection and the responsible use of plant protection products.			
Final Examination			
Assessment Type	Formal Exam	% of Total Mark	50
Marks Out Of	100	Pass Mark	40
Timing	End-of-Semester	Learning Outcome	1,2,3
Duration in minutes	0		
<b>Assessment Description</b> n/a			
Reassessment Requirement			
<b>A repeat examination</b> <i>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.</i>			

## 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	Weekly lecturers and class exercises on crop and forage science topics	Every Week	2.00	2
Independent Study	Non Contact	Independent and group based study on module content facilitated through online platforms	Every Week	2.00	2
Directed Reading	Non Contact	Directed reading on weekly selected topics	Every Week	2.00	2
Online Contact	Contact	Online contact to support continuous assessment assignments and lecture exercises.	Every Week	0.50	0.5
Practical	Contact	Practical on IPM use in grass and crop production systems	Every Week	0.50	0.5
				Total Weekly Learner Workload	7.00
				Total Weekly Contact Hours	3.00

Module Resources
<i>Recommended Book Resources</i>
<p>Collins, M. et al.. (2017), Forages, Volume 1, John Wiley &amp; Sons, p.432, [ISBN: 978-1-119-30064-9].</p> <p>McMahon, M.. (2019), Plant Science, Pearson, p.752, [ISBN: 978-0135184820].</p> <p>Lynch, J.P. et al.. (2016), The Winter Wheat Guide, Teagasc.</p>
<i>Supplementary Book Resources</i>
<p>Collins, C. and Phelan, S.. (2020), Crop Costs and Returns, Teagasc.</p> <p>Wolf, B., Snyder, G. (2003), Sustainable Soils, Hawort Press Inc, [ISBN: 1560229179].</p>
<i>Recommended Article/Paper Resources</i>
<p>Adamson, H., et al.. (2020), Review of evidence on Integrated Pest Management, DEFRA, Project No.: 27269.</p> <p>European Comission. (2009), Directive 2009/128/EC - Sustainable Use of Pesticides.</p>
<i>Supplementary Article/Paper Resources</i>
<p>Muck, R.E. et al. (2018), Silage review: Recent advances and future uses of silage additives, Journal of Dairy Science, 101, p.3980.</p> <p>Teagasc. (2016), Teagasc Technology Foresight 2035.</p>
<i>Other Resources</i>
<p>Link, Library Catalogue,  <a href="http://tinyurl.com/of7euvp">http://tinyurl.com/of7euvp</a>            Research Journal, Field Crops Research, Elsevier.            Research Journal, (2021), Grass and Forage Science, John Wiley and Sons, Inc..</p>