

Module Title:	Precision Agriculture
Language of Instruction:	English
Credits:	5
NFQ Level:	7
Module Delivered In	2 programme(s)
Teaching & Learning Strategies:	Content will be delivered based around lectures, visits to farms, research centres and machinery dealerships to see precision technologies in action and group discussions and practical sessions. Guest lectures by farmers, researchers and precision agriculture specialists on the selection and use of these technologies will form an integral part of delivery. Special attention will be given to Health and Safety aspects and to where these technologies may develop into the future.
Module Aim:	The aim of this module is to provide learners with an insight into the applications of precision agriculture technologies on Irish farms. Students will be introduced to the principles behind, and the operation and maintenance of guidance, autosteer, data collection, variable rate and sensing technologies. Students will also learn how to choose the technologies that best suit a particular situation and how to optimise their use. The module will develop learners' awareness of the most economical and sustainable means of procuring and operating machinery equipped with these technologies, while also introducing learners to the legal requirements and the health and safety regulations governing their operation.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Explain and illustrate how GIS, positioning, guidance, sensing and data collection systems operate on a fundamental level.
LO2	Demonstrate knowledge, understanding and critical awareness of how these precision systems are applied at farm level.
LO3	Demonstrate a knowledge and understanding of the wide range of precision technologies that apply to both tillage and livestock based enterprises. Students will be expected to critique the suitability of the technologies to different enterprises.
LO4	Explain the various regulations governing the operation and maintenance of precision farm technologies, with special attention to Health and Safety Regulations.
LO5	Illustrate and discuss the potential environmental and economic advantages to using precision technologies as opposed to conventional techniques.
Pre-requisite learning	
Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
Incompatible Modules <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>	
No requirements listed	

Module Content & Assessment
Indicative Content
Precision Technologies

Understanding the precision technologies that are available to Irish Agriculture: Positioning; Machine guidance; Data collection; Sensing. Learners will gain a knowledge of the principles underpinning the operation of each of these systems and an understanding of how they might be applied to agricultural systems

Understanding how precision technologies apply to farm equipment

Understanding how the technologies can be applied at farm level: Machine guidance; (light bars, autosteer, accuracy levels) Farm mapping (weed, disease, yield etc.) Data capture (sensors, cameras, drones etc.); Variable rate technologies (herbicide, fungicide, nutrient management)

Geographic Information Systems

Learners will be introduced to GIS and will be given an understanding of how GIS underpins a number of precision technologies relating to positioning, guidance etc.

Regulations Governing the Use of Precision Farm Equipment

Continuing on from health and safety aspects learned in the agricultural design and mechanisation module; this course will equip learners with the knowledge required to operate these technologies in a safe manner within current legislation

Financial and Environmental Aspects of Precision Technology

• Understanding the true costs of procurement, maintenance and operation of precision technologies • Costing of agricultural contractor services against ownership • Depreciation of machinery • Environmental sustainability impact of sensing/variable rate technologies

Assessment Breakdown	%
Continuous Assessment	70.00%
End of Module Formal Examination	30.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Case Studies	Case Study: Learners will be required to conduct relevant case studies in operation of precision technologies at farm level. An environmental and economic appraisal will be conducted to compare the use of these technologies with conventional techniques	2,3,4,5	35.00	n/a
Project	Project on the current uses, and future potential of sensing technologies in agricultural systems	1,2,3,4,5	25.00	n/a
Short Answer Questions	Assessing knowledge of fundamentals of precision systems, applications of precision agriculture and health and safety regulations.	1,2,3,4	10.00	n/a

No Project

No Practical

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	Terminal Examination	1,2,3,4,5	30.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	12 Weeks per Stage	2.00
Practicals	12 Weeks per Stage	1.00
Independent Learning	12 Weeks per Stage	3.00
Total Hours		72.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EFARG_B	Bachelor of Engineering (Honours) in Agricultural Systems Engineering	5	Mandatory
CW_EFARG_D	Bachelor of Engineering in Agricultural Systems Engineering	5	Mandatory