Module Title:	Quantitative Methods and Quality Control 1
Language of Instruction:	English

Credits:	5

NFQ Level:	6

Module Delivered In	[6 programme(s)](#)

Teaching & Learning Strategies:	This module will be delivered via two lectures of Quantitative Methods, two lectures of Quality Control and one computer practical per week. Self-tests and tutorial sheets will be available through Blackboard to reinforce learning.

Module Aim:	The aim of this module is to develop the students' understanding of the statistical concepts and techniques used in science and their understanding of the role and benefits of quality systems in industry.

Learning Outcomes

On successful completion of this module the learner should be able to:

LO1	Calculate and interpret summary statistical measures and display data using statistical graphs and charts. Apply statistical tools to explore data.
LO2	Identify common probability distributions, in particular the normal distribution, and calculate associated probabilities.
LO3	Describe fundamental quality concepts and identify quality improvement methodologies.

Pre-requisite learning

Module Recommendations
This is prior learning (or a practical skill) that is recommended before enrolment in this module.

No recommendations listed

Incompatible Modules
These are modules which have learning outcomes that are too similar to the learning outcomes of this module.

No incompatible modules listed

Co-requisite Modules

No Co-requisite modules listed

Requirements
This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.

No requirements listed

Module Content & Assessment

Indicative Content

Summary Statistics Data Organisation
Review of measures of central tendency and measures of dispersion. Data reduction, organisation and presentation. Population and sample, and data collection. Statistical critical thinking. Data cleaning.

Sampling and types of variables
Sampling techniques and introduction to probability distributions. Discrete and continuous random variables.

Fundamentals of Probability
Random variables and their associated probability distribution function. Examples of discrete random variables. Overview of general discrete probability distributions, common discrete probability distributions, including the Binomial and Poisson probability distributions.

Normal Distribution
Continuous random variables, probability density functions. The Normal Distribution. Use of tables. Applications of the Normal Distribution in the Biological Sciences. Indicators of normality and Normal Probability Plots.

Fundamental Quality Concepts
Definitions of Quality Control, Quality Assurance and Quality Management. Total Quality Management (TQM) and W Edwards Deming. Process model of quality and continous quality improvement.

Quality Standards
Definition of standards and standardization. Rationale, development and structure of standards. Standards supporting innovation. Accreditation and certification. GxPs. National and international standards bodies.

Economics of Quality
Definition and classification of quality costs, value of quality versus cost of quality. Problem solving tools including Pareto analysis, Vendor rating schemes, Flowcharting and Cause and effect analysis.

Assessment Breakdown	%
Continuous Assessment	70.00%
Practical	30.00%

Special Regulation

Students must achieve a minimum grade (35%) in both the CA and practical components of the course.

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Examination	Quantitative Methods and Quality Control examinations and assessments	1,2,3	70.00	n/a

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Computer practicals and assessments.	1	30.00	n/a

No End of Module Formal Examination

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

Module Workload

Workload: Full Time

Workload Type	Frequency	Average Weekly Learner Workload
Lecture	12 Weeks per Stage	4.00
Practicals	12 Weeks per Stage	1.00
Estimated Learner Hours	15 Weeks per Stage	4.33
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SABTP_B	[Bachelor of Science (Honours) in Biosciences with Biopharmaceuticals](#)	3	Mandatory
CW_SABRE_B	[Bachelor of Science (Honours) in Brewing and Distilling](#)	3	Mandatory
CW_SAPHA_B	[Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation](#)	3	Mandatory
CW_SAASC_D	[Bachelor of Science in Analytical Science](#)	3	Mandatory
CW_SABFQ_D	[Bachelor of Science in Biosciences](#)	3	Mandatory
CW_SASCI_C	[Higher Certificate in Science in Applied Biology or Applied Chemistry](#)	3	Mandatory