ZQUA C2101: Quantitative Methods and Quality Control 1

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

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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

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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