

Module Title:	Manufacturing
Language of Instruction:	English
Credits:	5
NFQ Level:	7
Module Delivered In	1 programme(s)
Teaching & Learning Strategies:	Manufacturing will be taught as a two hour theory class for 15 weeks and a two hour practical class for 15 weeks. Any course-related issue or questions that may arise will be discussed at lectures. Course lecture summaries, course calendar, announcements and other course-related information will be available on Blackboard, a virtual learning environment. Students can contact lecturer outside of class hours to discuss formative feedback given on written reports and group project work.
Module Aim:	To give the students a knowledge of the basic principles of Manufacturing and Analytical methods used in Biological Processes namely Food/Biopharmaceutical and other related industries
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Identify and describe the main components in a variety of biological processes
LO2	Demonstrate practical measurement and analytical skills using laboratory instruments and the commercial importance of same
LO3	Operate the range of instrumentation specified safely and efficiently in the laboratory
LO4	Work effectively in a group and demonstrate good communication skills especially in the area of problem solving and the solutions of same
LO5	Discuss the various food production methods involving microorganisms
LO6	Understand the importance of safety systems such as HACCP and GMP, in a modern processing operation
LO7	To be aware of the following in Food manufacture, R&D(research and development~), NPD(New product development), Sensory Analysis, Quality and GMP Auditing in modern food processing operations
LO8	To be familiar with modern Virtual techniques(eg Microsoft teams, Zoom etc) for the presentation of material
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>	
Successful completion of year 2 or equivalent	

Module Content & Assessment

Indicative Content

Manufacturing Technologies

The Food Industry in Ireland a current overview and future trends within the sector, and specific production processes from raw material procurement and supply to processing including critical control points(ccp.s) to final product and market and the legislative parameters of same. Major emphasis is placed on the production of "Safe food" and the analysis and regulatory analyses of same

Analytical

Development and validation of analytical assays, Good laboratory practice (GLP), Sample preparation, Quality Control in manufacturing

Chromatographic Techniques

Chromatography: principles and theory, Liquid chromatography (size exclusion chromatography, ion-exchange chromatography, thin layer chromatography (TLC) and high pressure liquid chromatography (HPLC)), Gas chromatography (GC), Gas chromatography-mass spectrometry (GC-MS).

Spectrometric Techniques

Spectrometric techniques involving use of visible, ultra violet (UV) infra-red (IR) spectra, Atomic spectrometric methods, Mass spectrometry, Nuclear magnetic resonance (NMR).

Practical

Practical skills will be advanced in chromatographic (TLC, GC and HPLC) separation and analysis of samples and spectrophotometric (visible, UV, IR, AA), determination of levels of e.g. iron, lead, inorganic phosphorus and manganese in various samples and also including a wide variety and food analyses including nutritional, and sensory

Assessment Breakdown	%
Continuous Assessment	20.00%
Practical	30.00%
End of Module Formal Examination	50.00%

Special Regulation

Learners must achieve 35% in both CA/Practical and Examination components

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	n/a	2,3,4,5,6,7,8	20.00	n/a

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Evaluation of practical laboratory work	2,3,4,6	30.00	n/a

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	Final formal examination	1,5,6,7,8	50.00	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>
Estimated Learner Hours	15 Weeks per Stage	2.00
Lecture	15 Weeks per Stage	2.00
Total Hours		60.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SABTP_B	Bachelor of Science (Honours) in Biosciences with Biopharmaceuticals	5	Mandatory

Discussion Note:	Major emphasis will be placed on the student to develop their communication skills both in class and virtually to help prepare them for the workplace
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