Course name: Chilling, freezing and food storage

ECTS	6
Course status	*basic,specialisation,optional, obligatory,facultativ*
Course final assessment /evaluation of outcomes	*graded credit*
Prerequisite	*no*

Main field of study:

Educational profile	General academic
Code of studies and education level	bachelor / master
Semester of studies	winter
Language of instruction	English

Course offered by:

Name of faculty offering the course	Faculty of Food Technology
Name of department offering the course	Department of Biotechnology and General Technology of Food
Course coordinator	dr hab inż. Magdalena Michalczyk, prof. URK

Learning outcomes:

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
KNOWLEDGE – student knows and understands			
CFFS_K1	the phenomena that occur during chilling, freezing and refrigerated and frozen storage of raw materials and food products, the principles and methods of chilling and freezing food	TŻ1_W02 TŻ1_W03 TŻ1_W05	RT
CFFS_K2	the principles of food preservation using the concept of hurdle technology	TŻ1_W02 TŻ1_W03 TŻ1_W05	RT
SKILLS – student is able to			
CFFS_S1	evaluate the overall range of product quality changes resulting from freezing and frozen storage	TŻ1_U04 TŻ1_U07 TŻ1_U10 TŻ1_U12	RT
CFFS_S2	propose the application of the concept of hurdle technology in the storage of a selected food product	TŻ1_U04	RT
SOCIAL COMPETENCIES – student is ready to:			
CFFS_C1	continuous further education and professional qualification.	TŻ1_K01	RT

Teaching contents

Lectures	30 hours
Topics	Effect of low temperatures on the rate of chemical and enzymatic reactions and microorganisms Refrigeration and cold storage of food Physical basis of freezing Ice production Freezing and frozen storage of raw materials and food products Changes in the quality of frozen foods Refrigeration as part of food preservation by hurdle technology
Accomplished learning outcomes	*CFFS_K1, CFFS_K2*

Means of verification, rules and criteria of assessment	*Written test. At least 51% correct answers are required for a passing grade.* *Contribution to the final evaluation 60%*
Classes:	30 hours
Application of hurdle technology to preserve refrigerated stored food products. Methods to reduce adverse quality changes occurring during freezing and storage of raw materials. Evaluation of quality and content of selected ingredients in frozen foods.	
Accomplished learning outcomes	*CFFS_S1, CFFS_S2, CFFS_C1*
Means of verification, rules and criteria of assessment	*Credit on the basis of reports and presentations.* *Contribution to the final evaluation 40%*

References:

Basic	*Evans. J.A.Frozen food science and technology, Blackwell Publishing Ltd, 2008.*
Supplementary	*Ghazala S. (ed.) Sous Vide and Cook-Chill Processing for the Food Industry, Aspen Publishers, inc., 1998.*

Structure of learning outcomes

Area of academic study: R – Agricultural, forestry and veterinary sciences	ECTS **
Area of academic study: T – technological sciences	6,0 ECTS**

Structure of student activity

Contact hours		64	hrs.	2.6 ECTS**
Including:	lectures	30	hrs.	
	classes and seminars	30	hrs.	
	consultations	2	hrs.	
	participation in research	0	hrs.	
	obligatory traineeships	0	hrs.	
	participation in examination	2	hrs.	
e-learning		0	hrs.	0 ECTS**
student own work		86	hrs.	3.4 ECTS**

*Areas of academic study in the fields of: H- humanities; S - social studies; P – biological sciences; T – technological sciences; M- medical, sport and health sciences; R – Agricultural, forestry and veterinary sciences; A – the arts

** stated with an accuracy to 0.1 ECTS, where 1 ECTS = 25 - 30 hours of classes