

Food Processing (I000061)

Course size (nominal values; actual values may depend on programme)

Credits 7.0 Study time 202 h Contact hrs 90.0 h

Course offerings and teaching methods in academic year 2016-2017

A (semester 1)	English	group work	2.5 h
		practicum	2.5 h
		seminar: coached	27.5 h
		self-reliant study	6.25 h
		lecture	32.5 h
		guided self-study	18.75 h

Lecturers in academic year 2016-2017

Dewettinck, Koen	LA07	lecturer-in-charge
Ragaert, Peter	LA07	co-lecturer

Offered in the following programmes in 2016-2017

	crdts	offering
Master of Science in Food Technology	7	A
Exchange Programme in Bioscience Engineering: Food Science and Nutrition (master's level)	7	A

Teaching languages

English

Keywords

Food, technology, unit operations, processing, quality, safety, shelf life, sensorial properties, nutritional value, packaging

Position of the course

The most important unit operations applied in the food industry are discussed. In particular attention is paid to the influence of applied unit operations on food quality in a wide sense.

Contents

Part 1: Unit processes

1. Heat transfer
2. Destruction of microorganisms
3. Heat treatments
4. Moist air conditions
5. Low temperature preservation
6. Freezing
7. Evaporation
8. Drying
9. Baking, roasting, frying and extrusion
10. High-pressure processing
11. Minimal processing methods
12. Irradiation, microwave heating

Part 2: Food packaging

1. Introduction: Function of packaging
2. Packaging materials
3. Packaging systems
4. Modified atmosphere packaging
5. Safety of packaging materials

Initial competences

Basic knowledge in food chemistry

Final competences

- 1 Understand unit operations and their combinations applied in food industry
- 2 Gain insight in unit operations and their combinations applied in food industry
- 3 Be aware of the impact of these unit operations on the quality of food products in a wide sense
- 4 Perform calculations on unit operations
- 5 Collect information about unit processes applied in food industry
- 6 Analyze information about unit processes applied in food industry
- 7 Critically apply gathered information on a selected case study
- 8 Integrate the gathered information on a selected case study in a written format
- 9 Critically evaluate the task of a peer by feedback and feedforward on the
- 10 Understand the different functions and compositions of packaging materials for food products
- 11 Gain insight in the interaction between food properties, packaging materials and filling systems

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Guided self-study, group work, lecture, practicum, self-reliant study activities, seminar: coached exercises

Extra information on the teaching methods

The theory is given by means of lectures. Slides are available as study material. During the exercises students have time to solve the problems individually or in group. Afterwards the solution is given for the whole group by the teacher or by a student. Students have to write a report of the practical session spray drying. Students have to make an integrated task covering unit processes necessary to produce a food product. During the semester, the progress is evaluated by teaching assistants and feedback and feed forward is given by peers.

Learning materials and price

The course slides are available on Minerva.
Optional handbook available (hard or soft copy)

References

Food Processing

- SINGH, R.P. & HELDMAN, D.R. (2014). Introduction to food engineering (Fifth Edition). San Diego. Academic Press Inc., 867 p. ISBN 978-0-12-398530-9
- FELLOWS, P.J. (2011). Food processing technology, Principles and practice (Third edition). Cambridge, Woodhead Publishing Limited and CRC Press LLC, 913 p. ISBN 978-1-4398-0821-4

Food Packaging

- AHAVENAINEN, R. (2003). Novel food packaging technologies. Woodhead Publishing Limited, Cambridge, ISBN 1-85573-675-6
- Air Products. A fresh approach to modified atmosphere packaging (MAP).
- BOSSET, J.O., GALLMANN, P.U., SIEBER, R. (1994). Influence of light transmittance of packaging materials on the shelf-life of milk and dairy products - a review. In: Mathlouthi, M. Food Packaging and preservation. Blackie Academic & Professional, London. ISBN 0-7514-0182-X.
- COLES, R., McDOWELL, D., KIRWAN, M.J. (2003). Food Packaging Technology, Blackwell Publishing, Oxford. ISBN 1-84127-220-5.
- KERRY, J.P., O'GRADY, M.N., HOGAN, S.A. (2006). Past, current and potential utilisation of active and intelligent packaging systems for meat and muscle-based products: a review. Meat Science 74, 113-130.
- OZDEMIR, M. & FLOROS, J.D. (2004). Active Food Packaging Technologies. Critical Review in Food Science and Nutrition, 44, 185-193.
- Packaging Europe, 2007. Volume 2.2, 2.3 and 2.5.
- ROBERTSON, G.L. (2006). Food Packaging. Principles and Practice. Second edition. Taylor & Francis, Boca Raton. ISBN 0-8493-3775-5
- Soft Drinks international. May 2007.
- VICKERS, F.G. & MEDLING, J. (2005). Filling equipment. In: Senior, D. & Dege, N. Technology of bottled water. Blackwell Publishing, Oxford. ISBN 1-4051-2038-X.

Course content-related study coaching

Possibility to consult a teacher or his collaborators after the theoretical lectures or exercises, on appointment.
The (practical) exercises are guided by a teaching assistant.

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Written examination with open questions, open book examination

Examination methods in case of periodic evaluation during the second examination period

Written examination with open questions, open book examination

Examination methods in case of permanent evaluation

Participation, assignment, peer assessment

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

Extra information on the examination methods

PE1 and PE2: The theory is assessed by a written examination (closed book). The exercises and calculations are assessed by an open book examination for which only printed course notes can be used.

NPE: the task is evaluated by the teachers and by peer evaluation. Participation during exercises and practical sessions is evaluated by presence and commitment.

Calculation of the examination mark

Theory (45%) - Exercises (35%) -Task (20%)

Students who eschew periodic and/or permanent evaluations for this course may be failed by the examiner.

Understanding Food Spoilage. How Food can be Preserved. The Role of Nutrition in New Product Development. Health, Food Development, and Processing. Essential Nutrients and Nutrition. Other Natural Additives. Nutrient Potential Assessment. Chemical Processing, Preservatives, and Additives. Defining Processed Foods. Additives for Appearance. Additives for Taste. Food Contact Materials. Thermal Food Processing, Pasteurisation and Microwave Cooking. Understanding Microbial Destruction. Types of Heating. How Legal Requirements Impact Food Processing. Food Production Management. Differences Between Manufacturing and Production. See more of Food Processing Equipment Pty Ltd on Facebook. Log In. or. Create New Account. See more of Food Processing Equipment Pty Ltd on Facebook. Log In. Forgotten account? Brook Food Processing Equipment. Commercial and industrial equipment supplier. Great Southern.