

Technology of Plant-Based Products (0000169)

Due to Covid 19, the education and assessment methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

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

Credits 5.0 **Study time 150 h** **Contact hrs** 60.0h

Course offerings and teaching methods in academic year 2021-2022

A (semester 2)	English	Incheon	practicum	30.0h
			lecture	30.0h

Lecturers in academic year 2021-2022

Mirzaei, Mahta	KR01	lecturer-in-charge
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Offered in the following programmes in 2021-2022

	crdts	offering
Bachelor of Science in Food Technology	5	A

Teaching languages

English

Keywords

Fats, oils, cereals (wheat, rice), sugars, sweeteners, vegetables, fruit, coffee, chocolate, fermentation, composition, processing, preservation, quality

Position of the course

This product focused course deals with the technologies applied in the processing and preservation of vegetable products. Knowledge of general food technology, food chemistry and food microbiology is applied on plant-based food products. Attention is paid to the study of the raw material, processing and preservation techniques, and quality aspects of the final product.

Contents

1. Fats and oils
 - 1.1 Composition and physical characteristics
 - 1.2 Production
 - 1.3 Refining
 - 1.4 Modification processes
 - 1.5 Edible fat products
2. Cereals: wheat and rice
 - 2.1. Wheat
 - 2.2. Rice
3. Sweeteners
 - 3.1 Sugar
 - 3.2 Alternative sweeteners
4. Fruit and vegetable processing
 - 4.1 Composition and physical characteristics
 - 4.2 Processing techniques
5. Plant-based fermentations
 - 5.1. Introduction: important fermentation pathways
 - 5.1.1. Lactic acid fermentation
 - 5.1.2. Fermented vegetables
 - 5.2. Alcoholic fermentations
 - 5.2.1. Beer
 - 5.2.2. Wine
 - 5.2.3. Sake/makgeolli
 - 5.3. Acetic acid fermentation
 - 5.4. Alkaline fermentation

- 5.5. High salt/savory sauce and paste fermentation
6. Soybean Processing
7. Chocolate
8. Coffee

Initial competences

The student has taken Food Technology and Food Chemistry

Final competences

- 1 Understand the processing of vegetal raw material into food products
- 2 Gain insight in the functionality and chemistry of the vegetal raw material used for food products
- 3 Gain insight in microstructure of plant based products and their production processes
- 4 Understand the principles of food fermentations and its applications
- 5 Integrate theoretical concepts in the practical sessions

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

Practicum, Lecture

Extra information on the teaching methods

Practicum:

Students make food products (: i) alcoholic beverages (beer and makgeolli), ii) tofu, iii) bread, beer) and pasta. Students analyze the characteristics of the produced foods: texture, color and hyperspectral imaging, moisture content, alcohol concentration.

Students get lab quizzes and make reports.

Learning materials and price

Slides and practical notes will be available on the electronic platform.

References

- BOCKISH, M. (1998). Fats and Oils Handbook. AOCS Press, 1998, 838 p.
- KULP, K and Ponte, J.G. (2000). Handbook of cereal science and technology. Marcel Dekker Inc., NY, USA, 790 p.
- KENT, N.L. and Evers, A.D. (1994). Kent's technology of cereals. Fourth edition. An introduction for students of food science and agriculture. Elsevier Science, Ltd., Oxford, UK, 334 p.
- YAMAZAKI, W.T. and Greenwood, C.T. (1981). Soft wheat: production, breeding, milling and uses. American association of cereal chemists Inc., USA, 307 p.
- Mc DINNIS, R.A. (1982). Beet sugar development foundation, USA, 855 p.
- Meade, G.P. and Chen, J.C.P. (1977). Cane-sugar handbook. John Wiley & Sons, Inc., 947 p.
- MARIE, S. and Piggott, J.R. (1991). Handbook of sweeteners. Blackie and Son, Ltd, London, 302 p.
- NABORS, L.O.'B. (2001). Alternative sweeteners. Third edition. Marcel Dekker Inc., New York, 553 p.
- SCHENK, F.W. and Hebeda, P.E. (1992). Starch hydrolysis products. VCH Publishers, 650 p.
- VARNAM, A.H. and Sutherland, J.P. (1994). Beverages, Technology, chemistry and microbiology. Chapman and Hall, London, 464 p.
- ASHURST, P.R. (1998). The chemistry and technology of soft drinks and fruit juices. Sheffield academic press, England, 258 p.
- DAUTHY, M.E. (1995). Fruit and vegetable processing. FAO Agricultural service bulletins, 382 p.
- TALBURT, W.F. and Smith, O. (1967). Potato processing. The Avi Publishing Company, Inc., Westport, Connecticut, 588 p.
- LIU, K. (1997). Soybeans. Chemistry, technology and utilization. Chapman Hall, Florence, USA, 532 p.
- Hutkins, R.W. 2006. Microbiology and technology of fermented foods. ISBN 978-0-8138-0018-9.

Bamforth, C.W. 2005. Food, fermentation and micro-organisms. ISBN 978-0-632-05987-4.

Hui, Y.H. 2006. Food biochemistry and food processing. ISBN 978-0-8138-0378-4.

Course content-related study coaching

Questions via mail, weekly office hours

Assessment moments

end-of-term and continuous assessment

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

Written examination with open questions

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

Report, Oral examination, Written examination with multiple choice questions, Written examination with open questions

Examination methods in case of permanent assessment

Report, Written examination

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Calculation of the examination mark

Theory: final exam (written + oral defense): 60 %

Theory: midterm: 15 %

Practical work (lab quiz + report): 25%

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.