The Hebrew University of Jerusalem

Syllabus

UNIT OPERATION IN FOOD TECH. AND FOOD ENG. A - 71434

Last update 06-09-2018

HU Credits: 4

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Biochemistry & Food Sciences

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: Rehovot

Course/Module Coordinator: Prof Ido Braslavsky

Coordinator Email: Ido.Braslavsky@mail.huji.ac.il

Coordinator Office Hours: By appointment

Teaching Staff:
Prof Ido Braslavsky
Ms. Vera Sirotinskay

Course/Module description:
Examination of the engineering principles and presentation of the fundamentals of fluid flow, heat transfer and mass transfer. Calculation and technological evaluation of the factors affecting the choices of equipment

Course/Module aims:
and technology, learning the scientific basis of engineering profession.
Understanding the principles of quantitative analysis of the processes in the food production
Creating a common language for dialogue with food technologists and engineers.
Development of quantitative and analytical thinking and expanding horizons.
Assimilation of knowledge to deal with scientific and technological challenges.

Learning outcomes - On successful completion of this module, students should be able to:
**Apply scientific and engineering principles in the design, selection and operation of equipment in production of save and high quality food.*
** Quantitative and analytical thinking*
** Deal with scientific and technological challenges.*

Attendance requirements(%):
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Teaching arrangement and method of instruction: 1. Weekly lectures and discussion.
2. Weekly exercises, attendance and assignments submission are mandatory.
3. Dealing with new knowledge acquiring methods.
4. Guest Lecture OR Food plant study tour (mandatory attendance).
5. Reading professional literature.

Course/Module Content:
2. Mass Balance
3. Food Rheology, Viscosity
4. Fluid Flow - Introduction
5. Fluid Flow, Bernoulli equation

6. Fluid Flow – Friction, Flow measurements, Non-Newtonian flow
7. Pumps
8. Steam Tables
9. Energy Balance
10. Heat Transfer – Conduction, Convection
11. Heat Transfer, Radiation, Overall heat transfer, Heat exchangers

Required Reading:
Singh, P.R. and Heldman, D.R. 2009. Introduction to Food Engineering (4th Ed.). Elsevier/Academic Press. Boston, MA, USA.

Additional Reading Material:
1. Heldman, D.R. and Toledo, R.T. 2007 (H&T). Fundamentals of Food Process Engineering (3 rd Ed.).Springer, Boston, MA, USA (http://site.ebrary.com/lib/huji/docDetail.action?docID&eq;10161187).
2. Geankoplis, C.J. 1983 (2nd Ed), 1993 (3rd Ed). Transport Processes and Unit Operation Processes and Unit Operations. Allyn and Bacon, Boston, MA. Prentice Hall International Edition (3rd Ed.).
3. Fryer, P.J. Pyle D.L. and Rielly, C.D. (Eds.), 1997. Chemical Engineering for the Food Industry. Blackie Academic, London, UK.
4. Watson, E.L. and Harper, J.C. 1988 (W&H). Elements of Food Engineering. Avi, Van Nostrand Reinhold, 2nd Ed., New York, NY. 664-WAT.
5. Earle, R.L. and Earle, M.D. (2004). Web Edition: "Unit Operations in Food Processing." The New Zealand Institute of Food Science & Technology Inc. (http://www.nzifst.org.nz/unitoperations).

Course/Module evaluation:
End of year written/oral examination 77 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 15 %
Reports 4 %
Research project 0 %
Quizzes 0 %
Other 4 %

Questions in class

Additional information:

1. Assignments and reports will be adjusted in case the test grade will reach 60 at least.

2. Submission of exercises in time is mandatory. Late submission will be considered as non submission. In case of illness or reserve service an appropriate confirmation should be submitted within two weeks.

3. Examination with open material (notebooks, books, pamphlets, articles, pages formulas, etc.)