

SYLLABUS:

Date / Revision 23 May 2015 / 02 May 2017 / PP
Faculty Life Sciences (LS)
Study Program Food Technology (FTE)

SUBJECT: Food Processing Technology 1

1 Basic Information

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|-------------|-------------------------------|--|
| 1.01 | Subject Name | Food Processing Technology 1 |
| 1.02 | Semester | 4 |
| 1.03 | Level | 1 |
| 1.04 | SKS | 3 |
| 1.05 | Mandatory / Curriculum | D-02 |
| 1.06 | Subject Code | FPT1 |
| 1.07 | Subject Code | FTE-CHE-D-LS-117 |
| 1.08 | Year | 2017 (7) |
| 1.09 | Quality Control | Final Test, OFSE, see evaluation |
| 1.10 | Limitations | Min 12 and Max 32 students in one class |
| 1.11 | Combined with | None |
| 1.12 | Pre-requisite | Chemistry and lab, Organic Chemistry and Lab, Microbiology, Physical Chemistry, Analytical Chemistry |
| 1.13 | Responsible | Dr. Tutun Nugraha |
| 1.14 | Revision | 15-05-2017/pp |

2 Description of Subject

The major objective for this course is to learn about the principles and methods for processing of food, with deeper understanding of how different processing conditions and methods can affect the safety and quality of the resulting food products. The course covers some processing techniques such as dehydration, blanching, pasteurization, sterilization, size reduction, mixing, forming, irradiation, baking, and roasting. Some typical local wisdom based processing techniques are also discussed especially in the 2nd part of the course.

3

Objectives

This course is one of the specialized subjects given as mandatory to students in Food Technology Department. It comprises of part 1 and part 2 and covers diverse mode of processing currently employed in the industry, including Indonesian traditional industries (local wisdom/tradition). Along the way students also learn that the processes are geared towards a certain set of quality of products which need to be attained to ensure quality of the final products. The course is also made available as an elective for students in the Chemical Engineering Department.

4

Competency

Through this subject students will understand various concepts relevant processing of raw materials in the industry in achieving the industrial targets of products with a certain quality:

- The techniques and function of different processings
- The application of each type of processing to achieve a set of quality objectives
- Control parameters of processing to ensure the above targets are achieved
- Calculation in thermal processing
- Food safety and quality assurance through technology

5

Learning Approach / Methodology

- Lectures/ Class contact (time-tabled) supplemented with interactive questions and answers to build the projects;
- Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing;
- Student Study Effort: homework/assignment; preparation for test/quizzes/ examination.
- Writing assignments/presentations

6

Evaluation

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| 5.1 | Absence maximum | 25% |
| 5.2 | Participation in Discussion | 5 Points |
| 5.3 | Homework / Classwork | 5 Points |
| 5.4 | Presentation /Simulation | 10 Points |
| 5.5 | Daily Quiz | 20 Points |
| 5.6 | Final Examination | 60 Points |
| | Total | 100 Points |

7 Text Book and Reference

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| 1 | Main Text Book: <ul style="list-style-type: none"> Food Processing Principles and Applications, Stephanie Clark, Stepahnje Jung, Buddhi Lamsal, Wiley, 2nd Ed. Wiley-Blackwell Fellows P. 2000. Food Processing Technology, Principles and Practice 2nd Dition. CRC Press. |
| 2 | Supplement Textbooks: <ul style="list-style-type: none"> Brennan JG. 2006. Food Processing Handbook. Wiley-VCH Hui YH. 2007. Handbook of Food Products Manufacturing. John Wiley & Sons, Inc |

8 Content / Topics of Lecture

| Week | Content/ Topics of Lecturing | Text Book Chapter | Remark |
|------|--|-------------------------------------|--------------------|
| 1 | Introduction to Food Processing Technology <ul style="list-style-type: none"> Basic principles Properties of foods and processing theory Effects of processing on nutritional properties & food safety | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |
| 2 | Raw Materials Preparation <ul style="list-style-type: none"> Cleaning Sorting Grading Peeling Application | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |
| 3 | Size reduction <ul style="list-style-type: none"> Size reduction of solid food Size reduction of liquid food Size reduction of emulsification Size reduction of homogenization | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |
| 4 | Mixing & forming <ul style="list-style-type: none"> Solid & liquid mixing Bread moulder Pie & biscuit former Confectionery moulder | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |
| 5 | Separation & concentration of food components <ul style="list-style-type: none"> Centrifugation Filtration Expression Extraction Membrane concentration | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |
| 6 | Fermentation & Enzyme Technology <ul style="list-style-type: none"> Fermented food Type of fermentation Controlling fermentation Enzyme function Application of enzyme | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |

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| 7 | Blanching <ul style="list-style-type: none"> • Theory • Steam blancer • Hot-water blancer • Application • Effect on foods | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |
| 8 | MIDTERM SEMESTER BREAK | | |
| 9 | Pasteurization <ul style="list-style-type: none"> • Concept • Equipment • Aseptic technology • F D Z value • Application • Effect on food | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |
| 10 | Sterilization <ul style="list-style-type: none"> • In-container sterilization • UHT • Aseptic technology • F D Z value • Application • Effect on food | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 Minutes |
| 11 | Irradiation <ul style="list-style-type: none"> • Theory • Equipment • Mechanism • Radiation dose • Dose distribution • Application • Effect on food | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 Minutes |
| 12 | Evaporation & distillation <ul style="list-style-type: none"> • Theory • Equipment • Mechanism • Application • Effect on foods | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |
| 13 | Extrusion <ul style="list-style-type: none"> • Rheological properties • Operating characteristics • Equipment (single & twin screw extruder) • Ancillary equipment • Application • Effect on foods | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |
| 14 | Baking & roasting <ul style="list-style-type: none"> • Theory • Direct & indirect heating • Oven (batch, semi-continuous, continuous) • Application • Effect on foods | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |

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| 15 | Dehydration <ul style="list-style-type: none"> • Methods • Hot air driers • Heated surface (contact) driers • Application • Effect on foods | Clark, Jung, Lamsal, Wiley, Chapter | 1 x 3 x 50 minutes |
| 16 | Final Examination | | |