

ITP 530

- **Rekayasa Proses Pangan
(Food Process Engineering)**
- 2 (2-0)
- Selasa 0800-0940am
- Dosen:
 - Purwiyatno Hariyadi (koord)
 - Azis B Sitanggang
 - Dase Hunaefi
 - Eko Hari Purnomo
 - Elvira Syamsir
 - Nur Wulandari



Definisi



<http://www.wageningenur.nl/en/Expertise-Services/Chair-groups/Agrotechnology-and-Food-Sciences/Food-Process-Engineering.htm>

Food Process Engineering

The Laboratory of Food Process Engineering aims at finding processes that are significantly more sustainable, producing products that combine excellent taste with better nutrition.



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Definisi



- Explore new principles for preparing food structure and food ingredients

Food Process Engineering

- Improve understanding of the dynamics of dispersed fluids and solids (relevant to food production)
 - translate the insight gained towards processes for sustainable production of foods and food ingredients.
 - Societally, we aim at finding processes that are significantly more sustainable, producing products that combine excellent taste with better nutrition.

Definisi

<http://www.engineering.auckland.ac.nz/uoa/mengst-food-process>



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Using engineering principles, food process engineers develop, analyse and optimise operations, assisting in new product development and helping to improve food processing, nutrition composition, preservation and packaging.



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Definisi

<http://www.ifnh.ethz.ch/vt>

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

LABORATORY OF FOOD PROCESS ENGINEERING
People
Research | Education | Publications
Intern

ETH Zurich - D-HEST - IFNH - FPE

Food Process Engineering

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Definisi

<http://www.ifnh.ethz.ch/vt>

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

LABORATORY OF FOOD PROCESS ENGINEERING
People
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Intern

- Addresses the basic question:
 - How does mechanical treatment influence food structure and vice versa, how the tuning of specific food properties due to well-characterized processes can be achieved?
- The overall goal is to understand and develop new processes that directly improve the state-of-the-art in food structuring.

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Definisi

Journal of Food Process Engineering

Journal of Food Process Engineering
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Impact Factor: 0.558
ISI Journal Citation Reports © Ranking: 2012: 91/124 (Food Science & Technology); 99/133 (Engineering Chemical)
Online ISSN: 1745-4530

SEARCH
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..... applications of engineering principles and concepts to food and food processes with emphasis on process simulation, including mathematical models to describe processes and to allow for scale-up of processes for food manufacturing.

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Definisi

<http://baen.tamu.edu/foodengineering/FEngr/FEngr.html>

Food Engineering

MAKE A DIFFERENCE BE A FOOD ENGINEER

Food engineering is the application of engineering principles to the storage, processing and distribution of food materials and their bio-products. It requires a sound engineering education, as well as fundamental training in chemistry and food science.

The Food Engineers in the Job

Food Engineers can make valuable contributions in various capacities of food chain. Design of processing, handling, packaging and storage equipment and systems; scale-up of prototype food processes, machinery, and equipment; product/process research and development; regulation and protection of the public health; and engineering and technical sales



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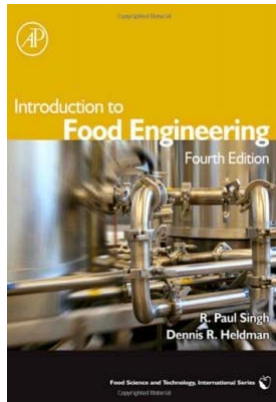
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REKAYASA PROSES PANGAN ?

Food process engineering



- is a broad field that is concerned with the application of engineering principles and concepts to the handling, manufacturing, processing and distribution of foods.

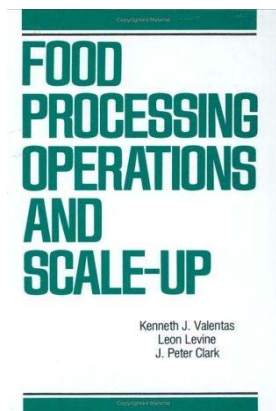
(R P Singh, R.P. And Heldman, D.R. 2008. Introduction to Food Engineering. Academic Press)



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REKAYASA PROSES PANGAN ?

Food process engineering



- is concerned with feasibility and practicality, that is, will something work and how much will it cost?
- Food engineers are educated to analyze, synthesize, design, and operate complex systems that manipulate mass, energy, and information to transform material and energy into **more useful form**

Valentas, K.J., Levine, L and Clark, J.P. 1991. Food Processing Operation & Scale-up. Marcel Dekker Incorporated).

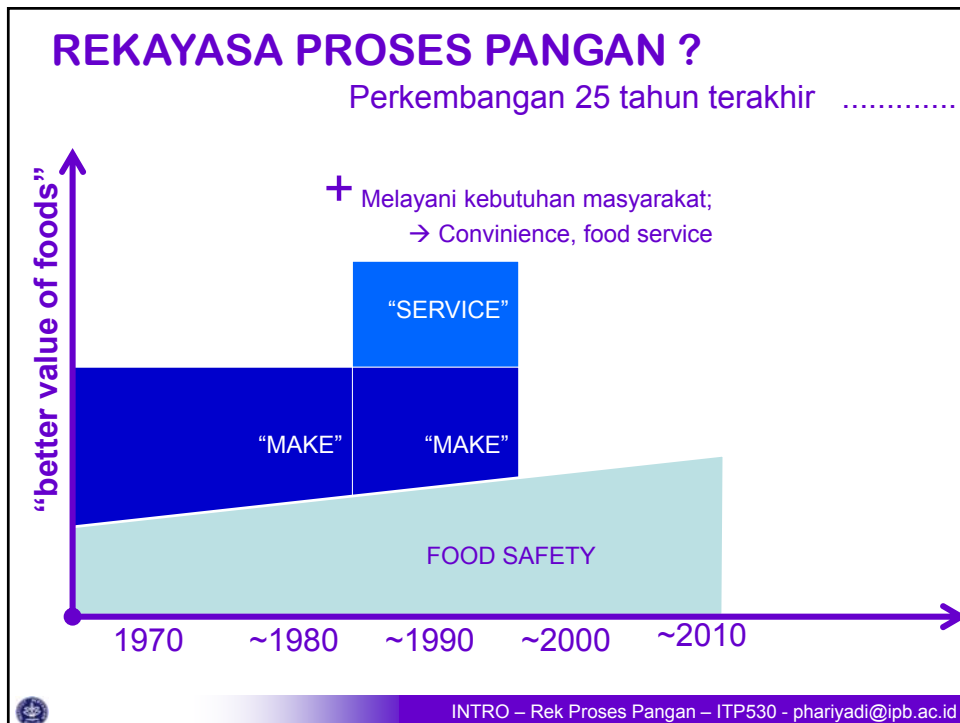
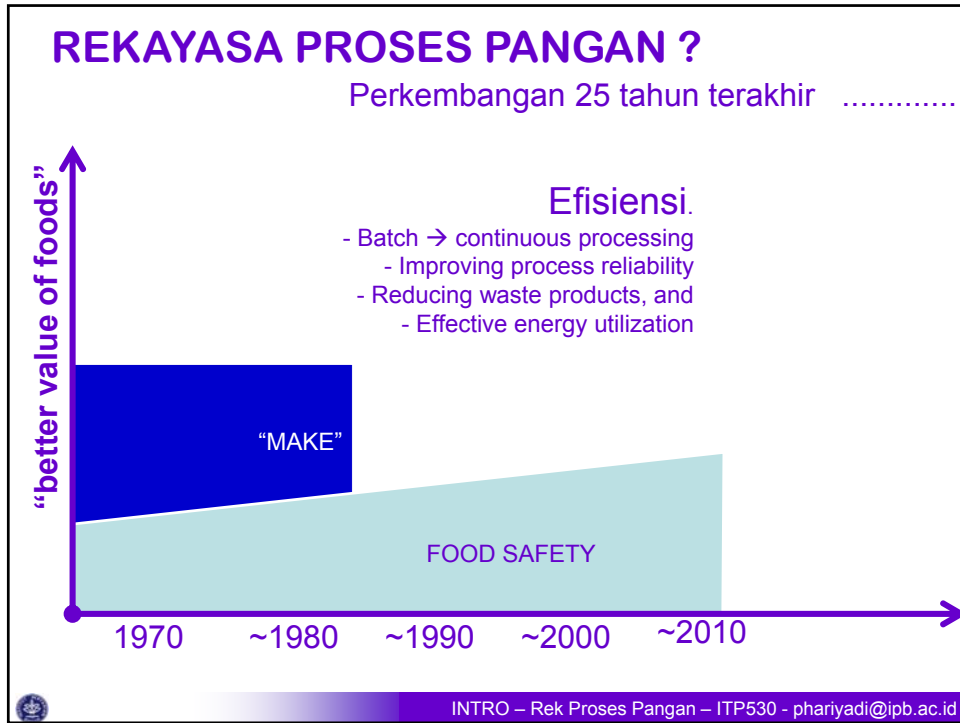


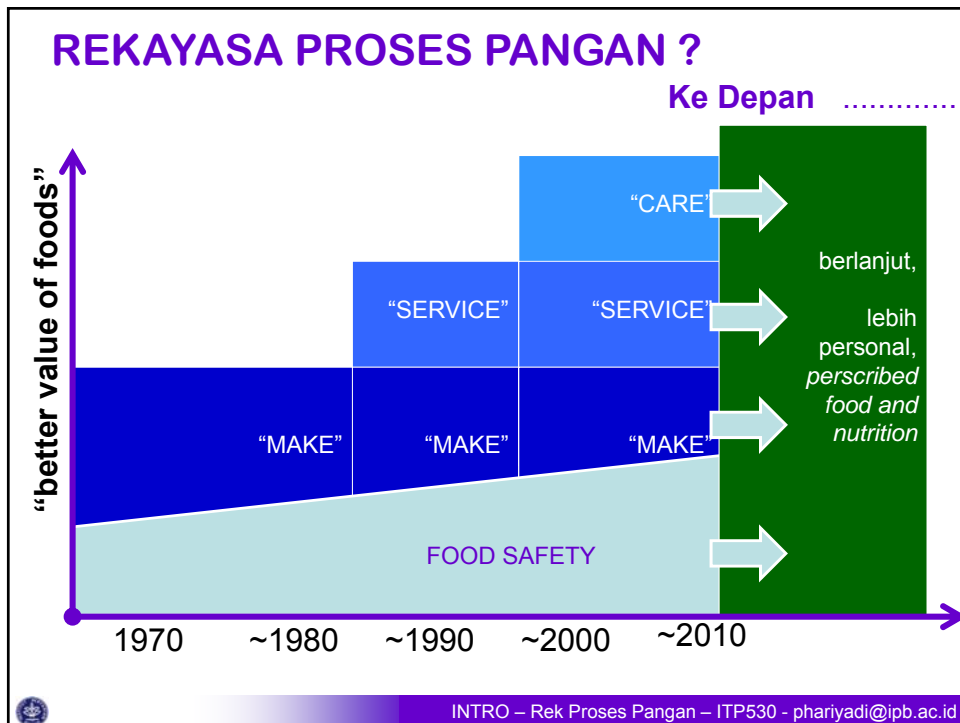
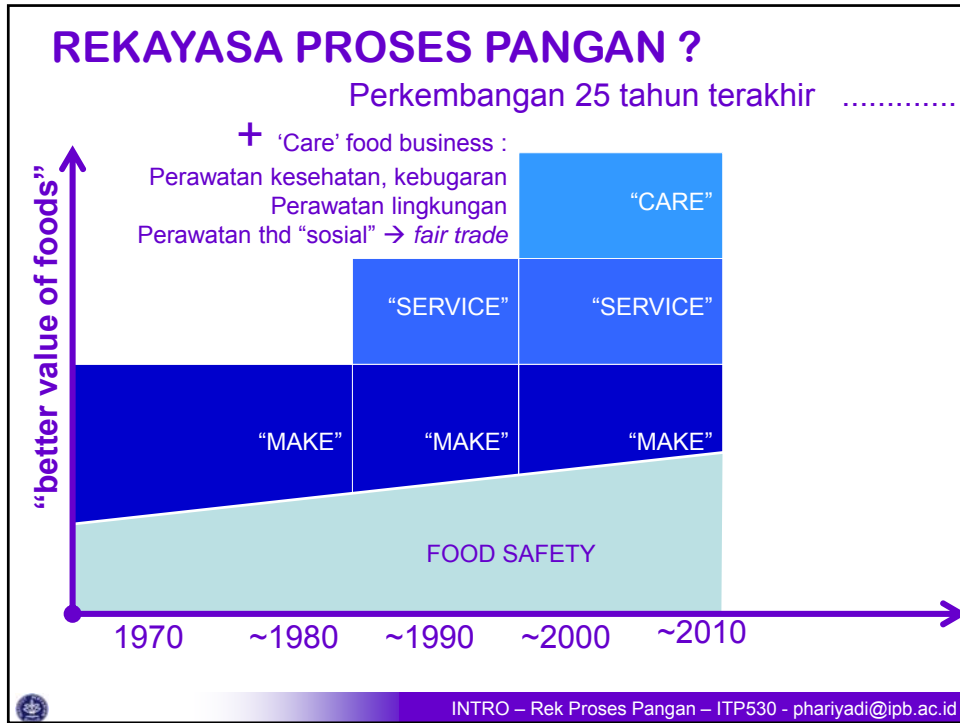
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SEBAGAI AHLI (REKAYASA PROSES) PANGAN

- You have to produce (even though with imperfect information)
- Thinking like an engineer
 - You don't have to be an engineer to think like one.
 - Many cases where it is a definite advantage to think like an engineer.
 - You have to examine the process(es) involved in the problem to be solved.
 - You don't only look at the symptoms of a problem but looks at the processes involved to get to the root cause of the problem.
 - Use proven analysis methods. Find and use a set of methods that have been proven to work in analyzing problems.



SEBAGAI AHLI (REKAYASA PROSES) PANGAN

- You have to produce (even though with imperfect information)
- Thinking like an engineer
 -
 -
 -
 -
 -
 - This means you have to know how to apply those methods
 - BUT, more importantly, you have to know which methods to apply to a given situation.
 - YOU have to know about and uses appropriate tools to carry those methods out.



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SEBAGAI AHLI (REKAYASA PROSES) PANGAN

- You have to produce (even though with imperfect information):
 -
 - Learns why (not just how) something is done.
(If you only know how something is done, you will eventually do it wrong. You need to understand why something is done, to make sure that you are doing it correctly).
 - Must come up with an answer to the problem.



SEBAGAI AHLI (REKAYASA PROSES) PANGAN

- You have to produce (even though with imperfect information):
 -
 -
 - Keep your skills updated.
(Applying an out-of-date solution is almost as bad as not providing any solution. You have to constantly look to see if new, better solutions to a problem exist).

You must fully understand the
“Physical, chemical, biological + engineering phenomena”
behind the problem you are facing (“object or problem of your study”)

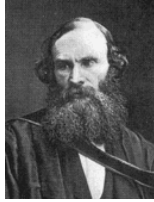


SEBAGAI AHLI (REKAYASA PROSES) PANGAN

Back to basics:

- Understand the “**physical, chemical, biological + engineering phenomena**” behind the problem you are facing (“object or problem of your study”)

Quotations of
LORD KELVIN
(Sir William Thomson)



"To measure is to know."

"If you can not measure it, you can not improve it."

"In physical science the first essential step in the direction of learning any subject is to find principles of numerical reckoning and practicable methods for measuring some quality connected with it. **I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the state of *Science*, whatever the matter may be.**" [PLA, vol. 1, "Electrical Units of Measurement", 1883-05-03]



SEBAGAI AHLI (REKAYASA PROSES) PANGAN

Back to basics:

- Understand the “**physical, chemical, biological + engineering phenomena**” behind the problem you are facing (“object or problem of your study”)

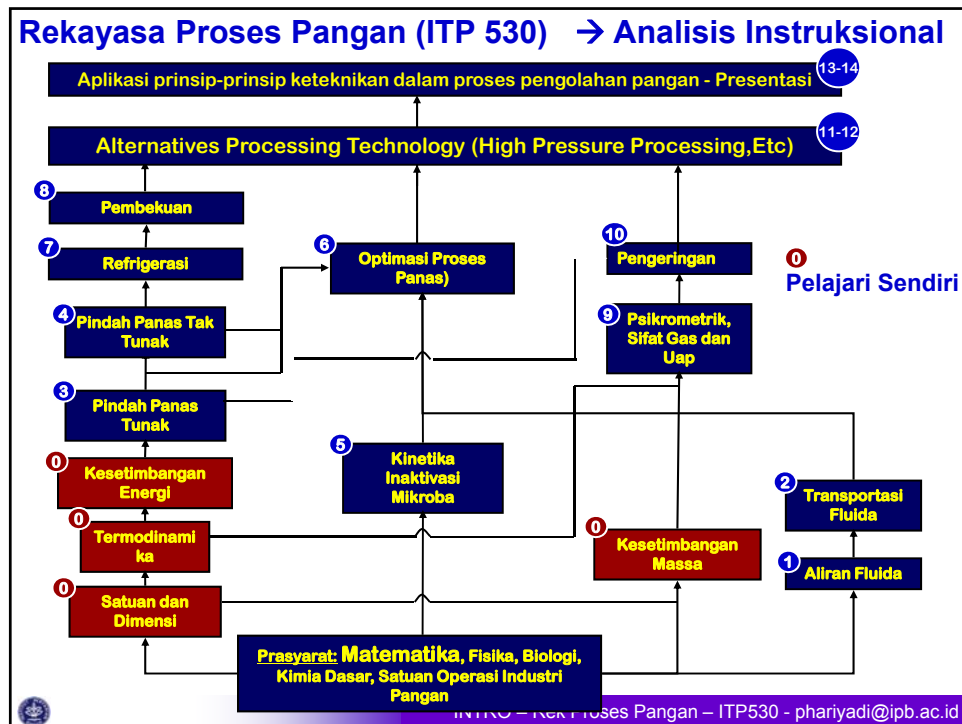


ITP530:

Pembahasan berbagai aspek rekayasa proses pangan, dengan fokus bahasan pada fenomena transfer (pindah momentum, pindah panas dan massa): liran fluida, pemanasan, kinetika dan proses panas/thermal process, pendinginan, pembekuan, pengeringan dan alternative (non-thermal) processes.



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Rekayasa Proses Pangan (ITP 530)

BUKU ACUAN

- Fundamental of Food Process Engineering, RT Toledo
- Introduction to Food Engineering, RP Singh and DR Heldman.
- Food Process Engineering, 2nd Ed. DR Heldman and RP Singh
- <http://rpaulsingh.com>
- <http://phariyadi.staff.ipb.ac.id/teaching/>
- Kumpulan Handout – Prinsip Teknik Pangan (ITP 330).
- Latihan Soal – Prinsip Teknik Pangan (ITP 330)



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Rekayasa Proses Pangan (ITP 530)

TUGAS

- **Pekerjaan Rumah/Latihan**
 - Akan diberikan secara “tidak teratur” sepanjang semester, kurang lebih 7 kali.
 - Topik atau soal PR dapat didiskusikan bersama, **TETAPI DIKERJAKAN SENDIRI.**
- **Tugas Kelompok + Presentasi Tugas Kelompok** di akhir semester
- **Extra** : Menulis di Media, tentang Rekayasa Proses Pangan (koran, majalah, dll) → upgrade “nilai”.



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Tugas Kelompok

Mata Kuliah Rek Proses Pangan (ITP 530)

Pembuatan Makalah Kelompok

- Satu kelompok (maks) 4 orang
- Tetapkan 1 org sbg ketua
- Pilih topik (sesuai dengan topik2 kuliah)
- Sesuai dengan topik yang dipilih; buat makalah (analisis) tentang aplikasi topik terpilih pada proses pengolahan pangan
- Topik dibicarakan di kelas (koord kelas) spy msg2 topik maks diambil oleh 2-3 group



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Tugas Kelompok

Mata Kuliah Rek Proses Pangan (ITP 530)

Pembuatan Makalah Kelompok

- Topik boleh sama tetapi diaplikasikan pada proses pengolahan yang berbeda
- Misalnya :
 - Aplikasi teknik pendinginan pada display di GIANT supermarket
 - Analisis proses pengeringan pada proses pengolahan pisang sale
 - Analisis keseimbangan massa pada proses pengolahan tahu di Desa X
 - Dll



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Tugas Kelompok

Mata Kuliah Rek Proses Pangan (ITP 530)

Pembuatan Makalah Kelompok

- Tulisan berdasarkan pada observasi dan studi pustaka
- Ingat
 - Tulisan kelompok (diskusikan)
 - Diakhir tulisan → Uraikan tugas masing-masing anggota kelompok
- Tulisan bisa disertai dengan foto2 dan ilustrasi, dll
- Tulisan dikumpulkan pada saat **Ujian Akhir**



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PENILAIAN

Penilaian akan dilakukan sebagai berikut :

- Ujian (2 x) : 60 %
- PR (total) : 25 %
- Tugas Kelompok/
 - Presentasi : 15%
 - Extra : 5%



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LAIN-LAIN

- Terlambat? Maks 10 menit!!
- Tidak main HP di kelas



Cek website
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