

Lecture contents

- Basic knowledge on chemical technology as a science
- Elements of chemical engineering
- Elements of economics and management

- Polish chemical industry
- Examples of large-scale chemical processes:
 - inorganic technology
 - organic technology
 - biotechnology
 - other

- Chemicals management

Topics of the lectures

Basic information's

Chemical technology relations to fundamental sciences

2. Terminology associated with applied chemistry and technology
3. Parameters determining efficiency of a full scale manufacturing process.
 - parameters connecting to raw materials
 - parameters connecting to products
 - other parameters
4. Technological process development
 - chemical and technological concepts of the technological processes
 - equipment sizing
 - technological principles

Topics of the lectures

Chemical engineering elements

Elementary processes and units

6. Mass transfer

- terminology associated with material balance
- basic rules: Fick's law
- reactor types used in batch and continuous processes

7. Energy transfer

- types of heat exchanger

8. Separation techniques

- physicochemical principles of rectification, extraction, filtration, osmosis, reversible osmosis, drying
- waste water treatment

Topics of the lectures

Technology...

Chemical, power and food processing industry – general

characteristic, common features and differences

10. Biotechnological processes – general description

- beer manufacturing
- synthetic ethanol manufacturing
- milk products manufacturing

11. Large-scale chemical processes

- fuels manufacturing (main resources and products properties, applications)

12. Polymers manufacturing (chosen synthesis, resources and products properties, applications)

13. Ceramic materials manufacturing (chosen technology)

14. Metals - chosen technology (resources, products properties and applications)

Topics of the lectures

Chemicals management

Characterization of materials and their critical physical
and chemical properties

- Software application (OECD QSAR) for assessing the hazards of chemicals

16. Regulation(EC) No 1907/2006 of the European Parliament and of the Council on the
Registration, Evaluation, Authorization and Restriction of Chemicals(REACH)

- Aim, scope and application this Regulation

17. Safety rules and risk assessment in chemical industry

18. Design of chemical technology process and evaluation of its costs

- Cost components (development)