

Course syllabus

Projektering Feasibility Studies on Industrial Plants

KETN25, 15 credits, A (Second Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED B/K

Date of Decision: 2023-04-18

General Information

Language of instruction: The course will be given in English on demand

Aim

The standard mode of operation in the chemical industry is to perform projects. This is true independent of the intention is to build a new plant, modify an existing plant or to develop a new chemical product. The course is intended give the method of process, plant and product design as well as knowledge regarding project management, economic prject assessment, market analyss and economic design.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- Understand how a project group works including knowledge on some common tools for project management.
- Understand how a project group work including knowledge on some common tools for project management.
- Understand the interaction of engineering, economy, market and legislation (risk and environment) in connection with a plant-design project.
- Have a complete insight to the tasks to be performed during a feasibility study.
- Have a complete insight to the tasks to be performed during aproduct development project.
- Have a complete insight to the dynamics and procedures of a project group.

Competences and skills

For a passing grade the student must

- Be able to search, evaluate and use information relevant for the project using university library resources and open electronic sources.
- Be able to reflect on the role that the student will take in a project group.
- Be able to estimate the operating and capital costs of a plant, as well as perform an investment and sensitivity analysis of a plant-design project.

Judgement and approach

For a passing grade the student must

- Perform a feasibility study of a plant or product together with an industrial enterprise.
- Participate in oral and written presentations of a feasibility study.

Contents

General idea of the different development phases from idea to a finished plant or product as well as practical advice on how to organise and work in groups.

Market: pricing and costs, prognosis and trend analysis.

Economics: estimates of operation and investment costs, production costs, cash-flow analysis, externalities and life-cycle costs, sensitivity analysis and economic design.

Technology: process synthesis, mass balances and process design.

Norms and legislation: chemical products, process safety, environment and localisation.

Practical exercise involving industrial process plant or product design. Technical and economical evaluation of a project, for instance a feasibility study of the construction of a process plant for a new product.

Examination details

Grading scale: UG - (U,G) - (Fail, Pass)

Assessment: Feasibility study. Attendance at lectures and exercises. Written report and oral presentation.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts

Code: 0117. **Name:** Theory.

Credits: 3. **Grading scale:** UG. **Assessment:** Task reports. Compulsory tasks and lectures, minimum of 75% attendance required for scheduled activities. **Contents:** Lectures and compulsory tasks on cost estimation and investment analysis.

Code: 0217. **Name:** Feasibility Studies on Industrial Plants.

Credits: 12. **Grading scale:** UG. **Assessment:** Project assignment. **Contents:** Feasibility project in cooperation with an industrial company.

Admission

Admission requirements:

- Advanced separations processes or KETN20 Sustainable Process Design - part 0117 Written Exam

Assumed prior knowledge: Process integration

The number of participants is limited to: No

The course overlaps following course/s: KAT070, KBT042, KTE110, KTE120, KET050

Reading list

- Ulrich G. D. and Vasudevan, P. T.: Chemical Engineering, Process Design and Economics, A Practical Guide, Second Edition. Process Publishing, Durham, New Hampshire, 2004, ISBN: 0-9708768-2-3. Reference literature.
- Shaeiwitz, J. A., Bhattacharyya D, Whiting, W.B.: Analysis, Synthesis, and Design of Chemical Processes, Fifth Edition. Prentice Hall, 2018, ISBN: 9780134177403. Reference literature.
- Seider, W D, Seader, J D, Lewin, D R and Widagdo, S.: Product & Process Design Principles, Third Edition. John Wiley and Sons Inc, 2010, ISBN: 978-0-470-41441-5. Reference literature.
- Stephen M Hall: Rules of Thumb for Chemical Engineers, A Manual of Quick, Accurate Solutions to Everyday Engineering Problems, Fourth Edition. Elsevier, Amsterdam, 2017, ISBN: 9780128110379. Reference literature.
- Sinnott, R.: Chemical Engineering Design, Principles, Practice and Economics of Plant and Process Design. Butterworth-Heinemann Ltd, 2019, ISBN: 9780081025994. Reference literature.

Contact and other information

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Course homepage: <https://www.ple.lth.se/en/>