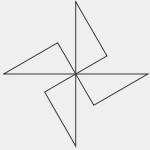


Bring ideas to life  
VIA University College



# DES M1

# Design of Energy Systems

Lecture 1  
Course intro

- Content
- Studynet
- Study activities
- Course work and assignments
- Evaluation



# Purpose

” The student will obtain

knowledge and calculation practice of refrigeration and heat pump systems so he/she will be able to design an efficient, environmentally friendly energy plant.”

competences to:

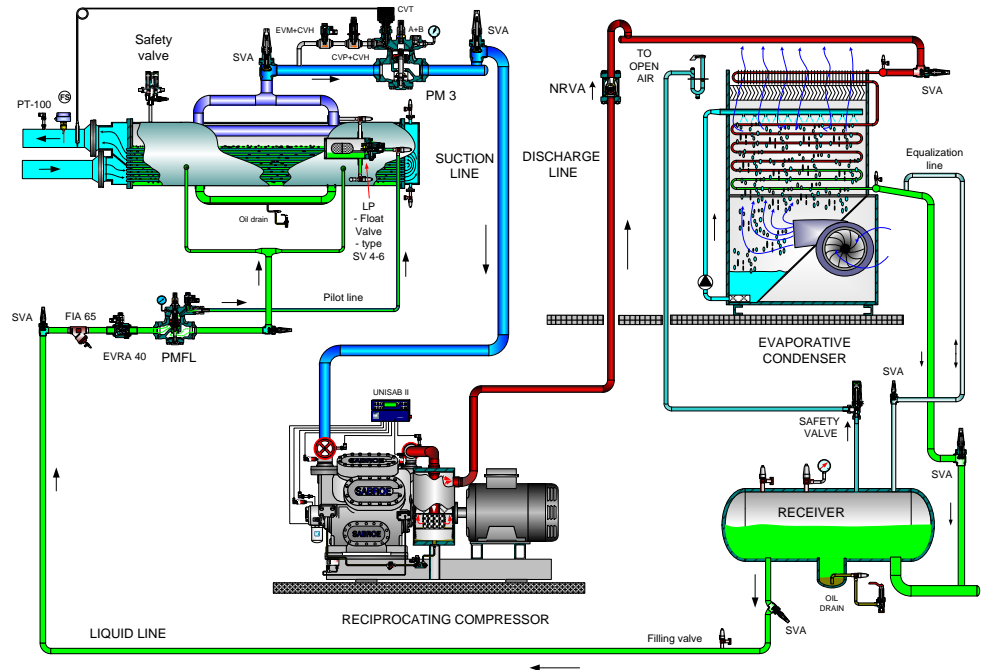
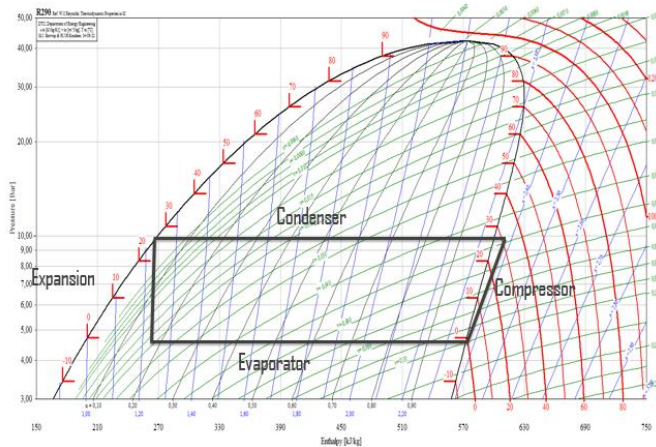
- **communicate** about designs of different types of energy plants
- **design** simple energy plants in a **methodical way** and more complex systems in **co-operation** with energy engineers”

# Your expectations to the course

- Make a group of 3 students
- Start with a short introduction to each other.
  - Who are you and where are you from?
  - What are you studying and how many semester have you fulfilled?
- Discuss your expectations to this course and write down 3.
- Do a short presentation of the group and your expectation to the class.

# Topics we will go through

## Log Ph diagram



Final Exam	YSA University College	Spring 2013
Student number: 194089	Design of energy systems	Max project: date 21
Table of content		
Final specifications	1	
Abstract	2	
1) Introduction	3	
2) Cooling load and capacity	4	
3) Preliminary design	4	
4) Temperature and log-ph diagram	5	
5) Main components	6	
6) Location of main components	7	
7) Pipe diagram, plant nomenclature, safety and control	8	
8) Compressor	8	
9) Receiver, safety and environmental issues	8	
10) Ambient noise and environmental impacts from the energy consumption	8	
11) Optimisation of the refrigeration plant to reduce the energy consumption	8	
Main report containing calculations and reflections	8	
12) Introduction	8	
13) Calculations of cooling load for each room on basis of 24 hours a day	10	
14) Calculations of the cooling capacity for each room	20	
15) Refrigerant selection	20	
16) Determination of evaporators for cooling circuit	21	
17) Determination of the main components	22	
18) Physical location of components	31	
19) Design of pipe diagram, plant nomenclature, safety and control	36	
20) Determination of health, safety and environmental issues	36	
21) Calculations of ambient noise and environmental impacts from the energy consumption	39	
22) Reflections of optimisation of refrigeration plant to reduce the energy consumption	41	

# How you will learn

Before class:

- Read presentations from last class, finalize exercises
- Read textbook and compendium, solve exercises and assignments. Solve quizzes on Studynet

At class:

- Questions from students
- Short lectures on basic concepts. Exercises in groups or individually
- Workshops on assignment problems

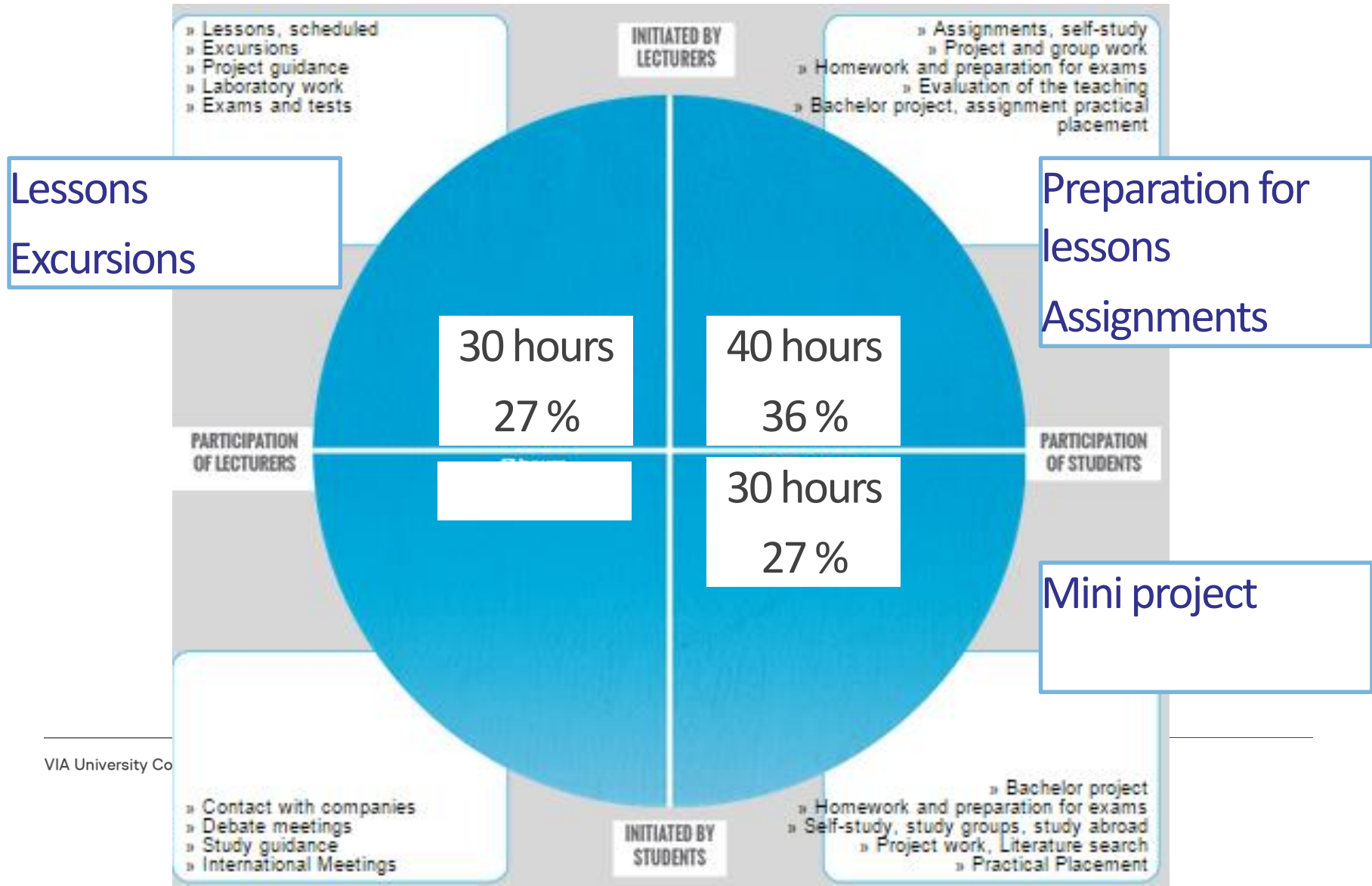
Exercises/assignments/mini project:

- Solving refrigeration problems from real life

Company visit:

- Visit to a compressor manufacturing company or similar

# Study activity model – DES M1



# Studynet

## Course info:

- Course description
- Lecture plan

## Session plan:

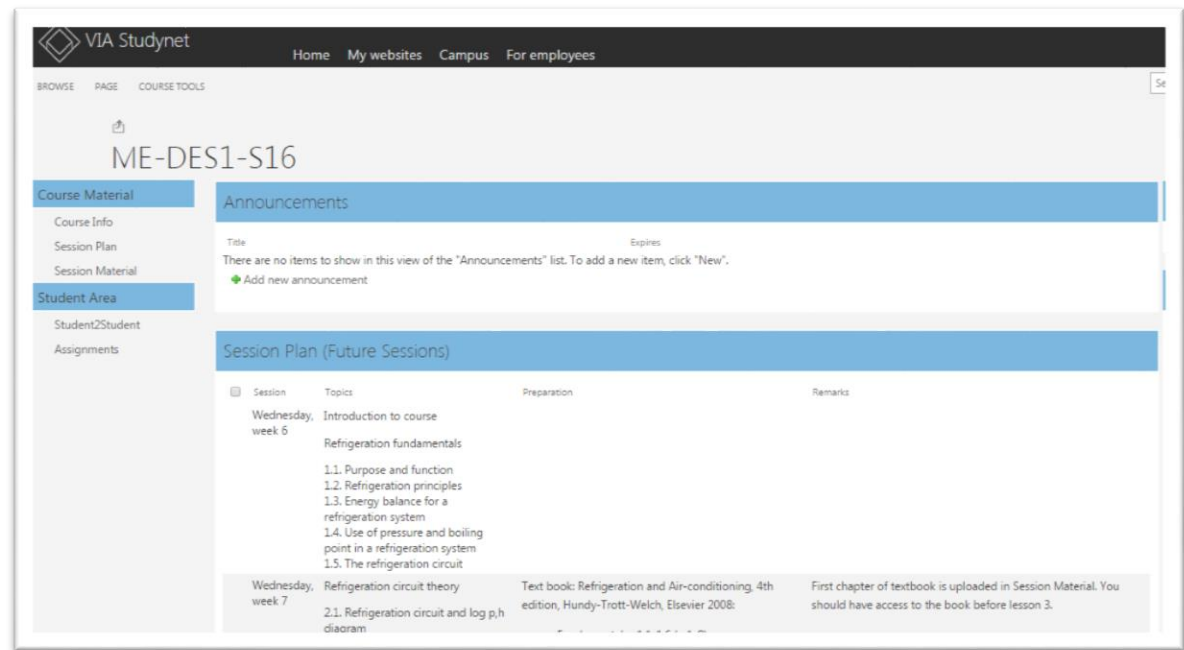
- Home work
- Information for next lesson

## Session materials:

- Compendium and other literature and material (continually)
- Assignments (continually)

## Assignments:

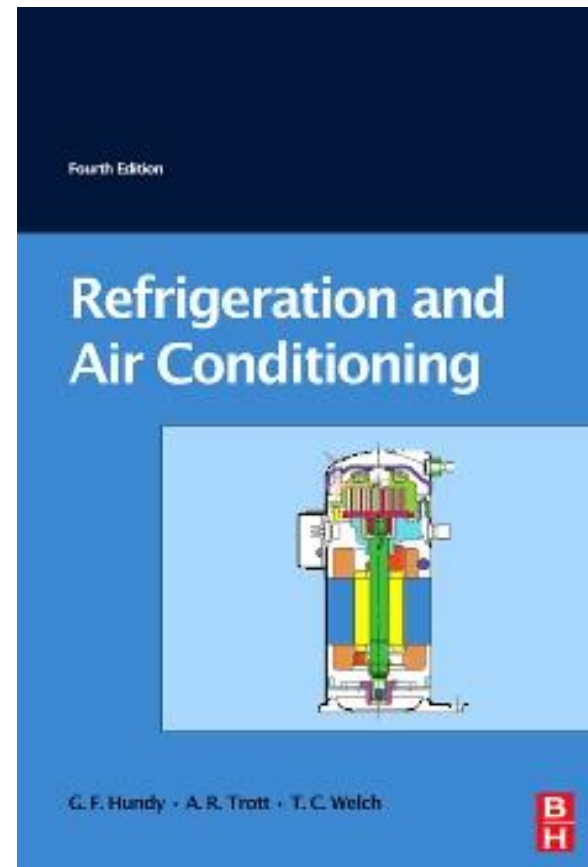
- All mandatory assignments to be handed in on Studynet!



# Literature

## Textbook:

- Book: Via Book Shop
- PDF: [Elsevier Store](#)
- First chapters on Studynet



## Compendium: Refrigeration, Theory and practice

- Studynet

## Collection of exercises 1

- Studynet or Via Book Shop



# Teaching evaluation – your opinion matters

Evaluation is considered an important and integral part of the education process at VIA Engineering

## **Midterm evaluation** (studynet – every semester)

- Purpose: possible adjustment and improvement of education in relation to the actual teaching

## **Final evaluation** (Survey Exact – every third time the course is held)

- Purpose:
  - Evaluate whether the study programme has lived up to the learning objectives
  - Examine the extent to which the individual study activities has benefited the students' learning outcomes

# How you will be evaluated

## Examination instructions for DES M1

From Course Description:

- Oral examination.
- External censor.
- Approximately 20 minutes based on one or several written task(s) solved during the course and questions in the subject matter.
- There will be given a mark from the ECTS scale (for fulltime students from the corresponding 7 step scale).

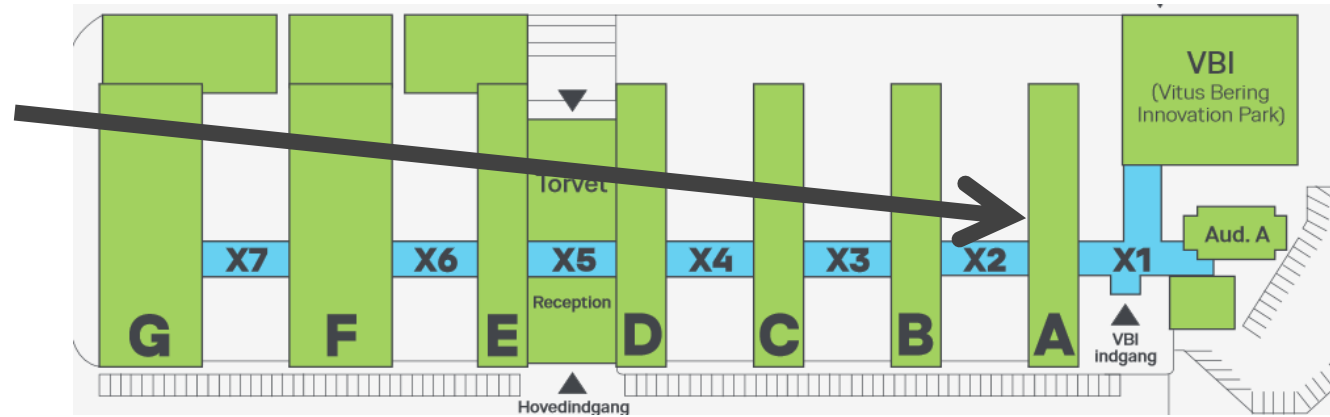
# Code of conduct

- Regular and punctual class attendance is expected
  - Door is closed when the lesson starts
  - If you are late you can enter the class in a break
- Laptops are for notetaking and other professional matters. Private communication during lessons is of course not allowed
- Active class participation is an important element in the learning process
- Keep yourself updated on Studynet and VIA mail

# Contact

Peter Bjerg  
Office: A302

Mail: [pbje@via.dk](mailto:pbje@via.dk)  
mobile: 87554028



You are always welcome to look us up at our office -  
if we aren't there, please send us an email ☺