

Package 5 Fundamentals and Design of Refrigeration system and heat exchanger

Brief Introduction:

This course deals with refrigeration processes and systems applied in different kinds of refrigeration units, from smaller plants in domestic units and supermarkets, to industrial plants in the food and process industry including the following contents:

- 1) Historic development and importance of refrigeration technology.
- 2) Thermodynamic analysis of different refrigeration processes with special emphasis on thermodynamic losses.
- 3) Properties of working fluids, including effects on the environment, including natural and environmentally friendly, working fluids.
- 4) Refrigeration system components, including different kinds of heat exchangers.
- 5) The performance analysis on the refrigeration systems and heat exchangers, as well as the optimization design for the system and heat exchangers.

a. Assessment:

Presentations (40%) + Homework Reports (40%) + Final Examination (20%)

b. Prerequisites to attend this program:

Engineering thermodynamics (not necessary)

c. References:

Textbooks : PDF version reference materials will be provided before the start of the course.

d. Introduction of Instructors:

Prof. Trygve Magne Eikevik (T. M. Eikevik)

Prof. Eikevik is a professor in the Department of Energy and Process Engineering, Norwegian University of Science and Technology, with responsibility for energy systems and product quality in the food engineering. He has over 30 years of research experience in refrigeration, heat pumping systems and their components. His main research areas include Energy Efficiency in Industry, Refrigeration and Heat Pumping Processes and Systems, Chilling, Freezing, Thawing and Tempering of Foods, Dewatering and Drying Engineering, Heat and Mass Transfer in Porous Materials, Thermal Properties of Food and other materials, Insulation Systems, etc. He has published over 100 papers, and has

been lecturing about refrigeration engineering since 1980. Details and publications are listed on the following website.

<http://folk.ntnu.no/tme/>

Dr. Haitao Hu

Dr. Hu is an associate Professor and Doctorial Supervisor in the Department of Mechanical Engineering, Shanghai Jiao Tong University, China. He holds a Ph.D. in Refrigeration and Cryogenics, with rich research experience in refrigeration systems and heat exchangers. His work has resulted in over 50 publications, including two books he co-authored. He was a visiting researcher at Norwegian University of Science and Technology during 2012-2013. He currently serves as the Executive Editor for the Chinese Journal of Refrigeration Technology. His research area is mainly focused on the heat exchangers, multiphase flow and heat transfer. Further details are listed on the following website.

<http://me.sjtu.edu.cn/English/Faculty/showDetail.aspx?id=426>

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