



The Hashemite University
Faculty of Engineering
Course Syllabus
Department of Mechanical Engineering

Course Title:	Refrigeration systems (3,0,0)	Course Number:	110402553
Designation:	Elective	Prerequisite(s):	110402222
Instructor:	Dr. Salem Nijmeh	email:	drnijmeh@hu.edu.jo
Required Course:	3 hours lectures per week		

Course Description:

Refrigeration systems classification. Food spoilage, preservation and storage processes. Theoretical and actual vapor compression cycles. Characteristics of several common and new refrigerants. Construction, operating characteristics, and selection of evaporators, compressors, and condensers. Operational characteristics and selection of cooling towers. Description of different types of expansion valves. Refrigeration load calculations.

Textbook(s) and/or Other Supplementary Materials:

Principles of Refrigeration” by R. Dossat, and T. Horan, Prentice Hall

References:

Jordanian Codes and ASHRAE Handbooks

Major Topics Covered:

Topic	# Weeks	# Contact hours*
Refrigeration systems classification	1	3
Food preservation and storage processes	2	6
Refrigeration cycle	2	6
Refrigerants	2	6
Refrigeration load calculations	1	3
Design and selection of evaporators, compressors and condensers	4	12
Cooling towers	1	3
Metering devices	2	6
Total	15	45

*Contact hours include lectures, quizzes and exams

Specific Outcomes of Instruction (Course Learning Outcomes):

After completing the course, the student will be able to:

- Identify and describe the five classifications of refrigeration. (e)
- Understand the causes of food spoilage and role of refrigeration in the preservation of food. (e)
- Describe the various processes used in food preservation and storage. (e)
- Analyze the theoretical and actual refrigeration cycles. (a),(e)
- Understand the reasons behind the Montreal Protocol, and the phasing out of certain refrigerants. (h)
- Compare performance between refrigerants based upon economical, environmental, and safety issues.(h), (j)
- Design and analyze refrigeration system components(c),(e),(k)
- Compute refrigeration system loads. (a),(e),(k)
- Carry out an engineering project in the field of refrigeration(c),(e),(g),(i),(k)

Grading Plan:

Mid-term Exam	(30 Points)
Project and class work	(30 Points)
Final Exam	(40 Points)

Student Outcomes (SO) Addressed by the Course:

#	Outcome Description	Contribution
General Engineering Student Outcomes		
(a)	an ability to apply knowledge of mathematics, science, and engineering	H
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	H
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	H
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	L
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	M
(i)	a recognition of the need for, and an ability to engage in life-long learning	M
(j)	a knowledge of contemporary issues	L
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	H
H=High, M= Medium, L=Low		

Prepared by:

Dr. Salem Nijmeh

Date:

10/9/2020