



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Storage and Refrigeration Technique							
Course Code		ST304		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	3	Workload	74 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The foodstuffs are generally processed by refrigeration technology in order to keep their initial quality as long as possible. In order to increase the effectiveness of the application of refrigeration technology, In the course, it is aimed to develop the fundamentals of the cold chain concept for food engineers to practice engineering in preservation of the quality							
Course Content		Water and freezing matter, importance of food freezing, microbial functions, refrigeration and freezing systems and methods, freezants, the effects of different refrigeration and freezing methods on foods, storage and transportation of frozen foods. Freezing process of various dairy products. Storage system, models and problems.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Individual Study, Problem Solving					
Name of Lecturer(s)									

### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

### Recommended or Required Reading

1	1. Gıda Mühendisliği Temel İşlemler, Bekir Cemeroğlu, Mehmet Özkan, Ayla Soyer, Gıda Teknolojisi Derneği Yayınları No :29. Ankara
2	Fundamentals of Food Process Engineering, Romeo Toledo, Chapman and Hall, 1994. New York

Week	Weekly Detailed Course Contents	
1	Theoretical	The history of refrigeration, ice manufacture and cold storage. Principles of refrigeration, refrigeration systems used in cold and freezer storages The history of refrigeration, ice manufacture and cold storage. Principles of refrigeration, refrigeration systems used in cold and freezer storages
2	Theoretical	Fundamental concepts and application of the refrigeration technology
3	Theoretical	Importance of refrigeration and current environmental phenomena
4	Theoretical	Cold preservation of foodstuffs (refrigeration cycles, cold stores
5	Theoretical	Cold preservation of foodstuffs (modified atmosphere packaging and controlled atmosphere storage
6	Theoretical	Freezing of foodstuffs
7	Theoretical	Analysis of heat gain sources in cold stores and energy conservation
8	Theoretical	The concervation of energy solutions in refrigeration tewchnology
9	Theoretical	Product based applications (cold transportation, controlled atmosphere storage
10	Theoretical	Feasibility of refrigeration units
11	Theoretical	Storage and transportation of frozen foods, properties of storage facilities, heat insulation, energy consumption
12	Theoretical	Shelf life and the effected factors on shelf life
13	Theoretical	The principles of shelf life systems and problems, Special food package systems
14	Theoretical	The concervation of energy solutions in refrigeration tewchnology
15	Theoretical	The concervation of energy solutions in refrigeration tewchnology

### Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	3	70
Midterm Examination	1	0	2	2



Final Examination	1	0	2	2
Total Workload (Hours)				74
[Total Workload (Hours) / 25*] = ECTS				3
*25 hour workload is accepted as 1 ECTS				

### Learning Outcomes

1	1. Demonstrate a basic knowledge on the principles applicable in production of cold,
2	2. Knowing of different storage conditions on the physiological, chemical and microbiological properties of dairy products
3	3. Knowing of suitable preservation systems of dairy products
4	4. Knowing of refrigeration and freezing techniques feasibility
5	5. An ability to use knowledge of mathematics, science and engineering

### Programme Outcomes (Dairy Technology)

1	Having sufficient infrastructure in basic sciences and engineering subjects and ability to use the theoretical and applied info instantly in this field.
2	Determining the modern techniques, tools and information technologies required for applications related with his field and ability to use them efficiently
3	Ability for planning, projecting, and designing, following up, analyzing and finding target-driven solutions related with his field
4	Ability to have professional ethic and awareness.
5	Ability to work, decide, express opinions orally and in written individually
6	Ability to participate team studies, taking responsibility, making leadership.
7	Ability to conceive Ataturk's principles and reforms, to communicate in Turkish and foreign language.
8	Ability to comprehend the necessity to learn for a life time, to monitor developments in science and technology and continuously renew himself.
9	Having sufficient level of information about production and quality control of milk and dairy products and also product development, increasing product quality and food security fields.
10	Ability to detect, define, solve problems related with his field and to select and apply suitable methods and modeling techniques for this purpose.
11	To be conscious about workplace applications, worker health, work security and environment subjects, to have knowledge about legal results of the engineering applications related with his subject.

### Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5
P1	4			4	5
P9	5	5	5		

