



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Nanotechnology Applications in Food Engineering							
Course Code		GMP626		Course Level		Third Cycle (Doctorate Degree)			
ECTS Credit	8	Workload	201 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The aim of this course is to teach nanoscientific and nanotechnological applications in food science and technology. The aim of this course is to teach nanoscientific and nanotechnological applications in food science and technology.							
Course Content		Nanoparticles/ synthesis and analysis techniques, polymeric nano and nanobioparticles, nanoscale emulsion types, thermodynamic and kinetic stability of nanoparticles, nanocomposites, nanogels, nanosensors, nanoencapsulation, food safety criteria in nanotechnology.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation)					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	40
Assignment	1	30

Recommended or Required Reading

1	Application of Nanotechnology in Food Science, Processing and Packaging, Egbuna, Chukwuebuka, et al., Springer, 2022
2	Nanotechnology Applications in Food, Oprea, A. E., & Grumezescu, Elsevier, 2017

Weekly Detailed Course Contents & Teaching Methods

Week	Weekly Detailed Course Contents & Teaching Methods	
1	Theoretical	Introduction to nanoscience and nanotechnology
2	Theoretical	Nanoparticles/ properties/ techniques to analyze
3	Theoretical	Food-based nanoparticles- Synthesizing techniques
4	Theoretical	Polymeric nanoparticles/ nanobioparticles
5	Theoretical	Nano-emulsions/ properties
6	Theoretical	Thermodynamic and kinetic stabilities of nanoemulsions
7	Theoretical	Nanocomposites/ nanostructures
8	Intermediate Exam	Midterm
9	Theoretical	Theoretical models of nanocomposite engineered properties
10	Theoretical	Nanogels
11	Theoretical	Nanosensors/ nanobiosensors in food technology
12	Theoretical	Nano-encapsulation techniques
13	Theoretical	Other applications of nanotechnology in food science and technology
14	Theoretical	Safety criteria for nanotechnological applications in food industry
15	Theoretical	Nanotechnological innovations / Femtotechnology
16	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	8	3	154
Assignment	1	14	1	15
Midterm Examination	1	15	1	16
Final Examination	1	15	1	16
Total Workload (Hours)				201
[Total Workload (Hours) / 25*] = ECTS				8

*25 hour workload is accepted as 1 ECTS



Learning Outcomes

1	To have knowledge about nanotechnology in food industry
2	To have deep knowledge about nanoparticle types, properties, synthesizing methods
3	To be able to do thermodynamic and kinetic calculations to find out nanoparticle stabilities
4	To be able to choose specific nanoparticles according to the application
5	To learn about nanotechnological innovations in food engineering
6	To learn safety criteria about nano-applications in food industry
7	To improve project development and presentation techniques

Programme Outcomes (Food Engineering Doctorate)

1	Developing and investigating the details of current and advanced knowledge in the field of Food Engineering by original thought and/or research on the level of expertise based on the graduate qualification and reaching to the original definitions that bring innovation to science.
2	Gain of ability of develop strategies, policies and implementation plans in the field of food engineering and evaluate the results within the framework of quality processes.
3	Gain of ability to perceive, design, evaluate and finish an original process by using and following the knowledge of the recent developments in the engineering fields.
4	Gain of ability of making critical analysis, synthesis and evaluation of ideas and development in food engineering field
5	Having advanced knowledge of food science and its applications based on doctoral level qualifications.

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

	L1	L2	L3	L4	L5	L6	L7
P1	4	4	4	4	5	4	
P2	5	5	3	4	4	3	3
P3	4	3	2	3	3	3	3
P4	3	4	4	4	2	3	4
P5	2	3	3	5		3	

