AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Nanomaterials in Drug Delivery Systems								
Course Code	KİM668		Couse Level		Third Cycle (Doctorate Degree)				
ECTS Credit	10	Workload	250 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	This course aims to give a broad information about the fundamental terminology, production and applications of nanomaterials for drug delivery.								
Course Content	Definition and history of nanomaterials, production and classification of nanomaterials, utilization of nanomaterials, drug release systems, controlled drug release and nanotechnology, mechanisms of drug release, nanoparticle production methods for drug release and characterization, nanomaterials in medicine, examples of nanomaterials as drug release systems in biotechnology, cosmetics, radiopharmacy and veterinary.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Individual Study								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	35
Assignment	3	45

Recommended or Required Reading	
1	Melgardt M. de Villiers, Pornanong Aramwit, Glen S. Kwon, Nanotechnology in Drug Delivery, Springer, 2009.
2	Lecture notes

Week	Weekly Detailed Course Contents	
1	Theoretical	Definition and history of nanomaterials
2	Theoretical	General considerations on utilization of nanomaterials
3	Theoretical	Production techniques and classification of nanomaterials
4	Theoretical	Terminology, history and future of drug release systems
5	Theoretical	Pharmacokinetic basis of drug release
6	Theoretical	Drug release systems (microcapsules, microspheres, nanoparticles, liposomes and micelles)
7	Theoretical	Application routes of drug release systems
8	Theoretical	Controlled drug release and nanotechnology
9	Theoretical	Mechanisms of drug release
10	Theoretical	Midterm Exam
11	Theoretical	Monomers and polymers used in production of nanomaterials as drug release systems
12	Theoretical	Design and physiological and biological characterization of nanomaterials as drug release systems
13	Theoretical	Targeting in nanomaterials based drug release systems
14	Theoretical	Utilization of nanomaterials in cancer theraphy and other medical applications
15	Theoretical	Examples for usage of nanomaterials as drug release systems in biotechnology, cosmetics, radiopharmacy and veterinary
16	Theoretical	Final exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	3	42
Assignment	7	0	10	70
Midterm Examination	1	64	2	66

Final Examination	1	70	2	72
			Total Workload (Hours)	250
			[Total Workload (Hours) / 25*] = **ECTS**	10
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To have knowledge about the structure and function of nanomaterials.
2	To have knowledge about the basis of drug release systems.
3	To learn the integration and applications of nanomaterials with drug release.
4	To have knowledge about the drug release systems
5	To have knowledge about the Targeting in nanomaterials based drug release systems

Programme Outcomes *(Chemistry Doctorate)*	
1	Depending on the master degree competences, develops, insights and innovates current and advanced knowledge and/or research in proficiency level.
2	Gains high skill levels in using research methods in the field of his/her study.
3	Comprehends the interaction between disciplines related to his/her field. Reaches to original results using his/her expertise in order to analyze, synthesize and evaluate new and complicated ideas.
4	Enlarges the boundaries of his/her field of knowledge by publishing at least one research paper in national and/or international peer-reviewed journals.
5	Defends his/her original opinions related to his/her field before authority and communicates effectively illustrating his/her competence.
6	May communicate and debate written, orally and visually in European Language Portfolio level C1.
7	Follows the developments in computer software and information and communication technologies developed for his/her research area and uses these in order to solve research problems.
8	Collaborates for scientific research with national and international research teams.
9	Contributes to the course of creation and maintenance of knowledge based society and by introducing the scientific, social and cultural developments to the society he/she is living in.

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	5	5	5	5	5
P2	4	4	4	4	4
P3	3	3	3	3	3
P5	4	4	4	4	4
P7	3	3	3	3	3