



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Biochemistry of Musculoskeletal System							
Course Code		BYK631		Couse Level		Third Cycle (Doctorate Degree)			
ECTS Credit	3	Workload	75 (Hours)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The aim of this course is to enable students to comprehend the tissue-specific biochemical reactions taking place in bone, cartilage, fat and muscle tissues and to interpret the similarities and differences between their metabolisms.							
Course Content		Biochemistry of bone, cartilage, adipose and muscle tissue and related biochemical tests. Understanding the molecular mechanisms in pathogenesis of musculoskeletal system diseases.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Experiment, Demonstration, Discussion, Individual Study					
Name of Lecturer(s)									

Assessment Methods and Criteria

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

Recommended or Required Reading

1	The Musculoskeletal system: embryology, biochemistry, and physiology :Richard L. Cruess
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Week	Weekly Detailed Course Contents	
1	Theoretical	Definition of tissue, organ and system. Differentiation of tissues
2	Theoretical	General properties of bone tissue. Bone tissue matrix.
3	Theoretical	Importance of collagen and minerals for bone tissue.
4	Theoretical	Enzymatic reactions in osteoclast and osteoblast cells and regulation of these reactions.
5	Theoretical	Hormonal regulation of calcium levels in bone tissue and "remodeling" reactions of bone. Bone mineralization.
6	Theoretical	General features of cartilage tissue.
7	Theoretical	General properties of adipose tissue. White and brown fat texture.
8	Intermediate Exam	Biochemistry of Musculoskeletal System Midterm Exam
9	Theoretical	Enzymatic reactions in adipose tissue cells and hormonal regulation of these reactions.
10	Theoretical	Triglyceride biosynthesis and storage in adipose tissue.
11	Theoretical	Endocrine functions of adipose tissue. Leptin and its role in obesity.
12	Theoretical	Classification and general features of muscle tissue. Important proteins in muscle contraction. Biochemical mechanism of muscle contraction. Creatine phosphate metabolism.
13	Theoretical	Regulation of glycolysis and gluconeogenesis in muscle tissue.
14	Theoretical	Use of energy sources in muscle tissue in rest and exercise state. Energy metabolism in muscle tissue.
15	Theoretical	Diseases of musculoskeletal system.
16	Final Exam	Biochemistry of Musculoskeletal System Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	12	0.5	1	18
Lecture - Practice	9	1	4	45
Midterm Examination	1	5	1	6
Final Examination	1	5	1	6
Total Workload (Hours)				75
[Total Workload (Hours) / 25*] = ECTS				3

*25 hour workload is accepted as 1 ECTS



Learning Outcomes

1	To be able to remember the basic concepts of bone, cartilage, muscle and adipose tissue metabolism
2	Be able to write biochemical reactions specific to bone, cartilage, muscle and adipose tissues
3	To be able to comprehend the differences in metabolic pathways in musculoskeletal system tissues
4	To be able to comprehend the importance of reactions taking place in organs forming organs for organ function
5	To be able to interpret the structure-function relationship in motion system tissues

Programme Outcomes (*Biochemistry (Medical) Doctorate*)

1	To have basic theoretical knowledge about biochemistry and to help understanding biochemistry
2	To have the basic laboratory knowledge, apparatus and methods used in biochemistry
3	Analysis: To be able to analyze information critically
4	Synthesis: To be able to synthesize and adapt the knowledge in the field from different directions
5	Evaluation: To critically evaluate research in the field

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	5	4	5	4
P3	5	4	5	4	5
P4	4	5	5	5	4
P5	5	5	4	5	5

