

<b>PATHOPHYSIOLOGY OF METABOLIC BONE DISEASES</b>	
<b>GENERAL INFORMATION</b>	
Course coordinator	Professor Jasminka Milas-Ahić, MD, PhD
Assistant/Associate	Assistant Professor Silviya Canecki Varžić, MD, PhD
Study Programme	Integrated undergraduate and graduate university study of Medicine
Status of the course	Elective
Year of study, semester	3 <sup>rd</sup> year, 6 <sup>th</sup> semester
ECTS	<b>2</b>
Workload (hours)	Lectures (10); Seminars (10) ; Exercises (5)
Expected number of students	30
<b>COURSE DESCRIPTION</b>	
<b>Course objectives</b>	
The aim of the course is to educate students on pathophysiological mechanisms of the metabolic bone diseases, describe the methods evaluating bone mineral density and monitoring the effect of osteoporosis treatment. This approach of teaching from the preclinical research to the clinical medicine aims to acquaint students with the basic principles of translational medicine.	
<b>Enrolment requirements and entry competencies</b>	
<b>Learning outcomes at the Programme level</b>	
<b>1.1., 1.2., 2.1, 2.2, 2.3, 3.4.,3.5., 4.2.</b>	
<b>Learning outcomes (5-10)</b>	
After attending lectures, completing seminars and exercises, following by study and final examination, students will be able:	
<ol style="list-style-type: none"> <li>1. to determine and interpret the main mechanisms of bone remodeling and the role of bone cells in bone regeneration</li> <li>2. to interpret and critically assess the role of the RANK/RANKL/OPG system in the mechanism of bone remodeling and the onset of osteoporosis</li> <li>3. to determine and compare the pathogenetic mechanisms of the postmenopausal and senile osteoporosis and evaluate the significance of estrogen, vitamin D and risk factors in osteoporosis manifestations</li> <li>4. to evaluate and distinguish parathyroid hormone disorders in primary and secondary hyperparathyroidism</li> <li>5. to critically assess and determine the key mechanisms of other metabolic bone diseases, such as Paget's disease, renal osteodystrophy, and osteopetrosis</li> <li>6. to interpret the methods of bone mineral density assessment and fracture risk estimation.</li> </ol>	
<b>Course content</b>	
<b>Lectures</b>	
P1 - Pathophysiology of primary or idiopathic osteoporosis. Bone densitometry. P2 - Pathophysiology of osteomalacia and rickets; P3 - Pathophysiology of renal osteodystrophy; P4 - Hyperparathyroidism, hypoparathyroidism; P5 - Pathophysiology of Paget's disease and osteopetrosis.	
<b>Seminars</b>	

S1 - Pathophysiology of postmenopausal osteoporosis; S2 - Pathophysiology of glucocorticoid induced osteoporosis (GIOP); S3 - Renal osteodystrophy, adynamic bone disease; S4 – Pathophysiology of secondary hyperparathyroidism; S5 - Pathophysiology of acute hypocalcaemia during Paget's bone disease therapy with mithramycin. Pathophysiology of incomplete osteogenesis syndrome.

**Exercises**

Exercise 1-3: Clinical presentations of patients with postmenopausal osteoporosis, senile osteoporosis, secondary osteoporosis (GIOP), primary and secondary hyperparathyroidism.

Exercise 4-5: Bone densitometry (DXA) - performance and interpretation of DXA results, determining the risk of fracture.

**Mode of teaching**

Lectures; Seminars; Exercises

**Student obligations**

Students are expected to attend all class sessions, as well as to take all the examinations. However, they are allowed for excused absences, totalling 30% of all classes.

**Monitoring student work (alignment of learning outcomes, teaching methods, and grading)**

Teaching activity	ECTS	Learning outcome	Student activity	Assessment methods	Grade points	
					Min.	Max.
Class attendance	0,5	1-6	Class attendance; exercises	Evidence sheet; evaluation	5	20
Seminars, exercises	0,5	1-6	Active participation and presentation at seminars, exercises	Records of activity and presentation at seminars	10	20
Final exam	1,0	1-6	Learning for the final exam	Grading of the written exam	35	60
<b>Total</b>	<b>2</b>				<b>50</b>	<b>100</b>

*Evaluation/grading of the final written examination:*

Percentage of correct answers (%)	Grade points
60,00-69,99	35
70,00-79,99	42
80,00-89,99	49
90,00-94,99	56
95,00-100,00	60

*Calculation of final grade:*

Students who achieved 35 or more points in the final exam, the points obtained in the final exam are added to the grade points obtained during the class, and this sum constitutes the final grade. Since the study program schedule descriptive assessment of elective courses, the course coordinator awards the grade "passed" to a student who achieves 50 or more grade points in the course.

<b>Required reading (available in the library and through other media)</b>		
Title	Number of copies in the library	Availability through other media
1. Patofiziologija, udžbenik, Medicinska Naklada, Zagreb, VIII izdanje, 2018. Urednici: Gamulin, S. Kovač Z., Marušić M.	6	
2. Patofiziologija. Zadatci za problemske seminare III izdanje, Medicinska Naklada, Zagreb, 2011. godine Urednici: Kovač, Z. Gamulin, S. i sur.	14	
<b>Additional reading</b>		
1. Avioli L.V., Krane S.M. (2002). Metabolic Bone Disease, 4th ed. New York: Academic Press. 2. Selected articles.		
<b>Course evaluation procedures</b>		
Anonymous, quantitative, standardized student survey providing feedback on the course as well as on the work of course coordinators and their assistants/associates is being conducted by the QA Office of the Faculty of medicine Osijek.		
<b>Note /Other</b>		
E-learning does not count towards course contact hours but is being used in teaching and comprises links to various web pages, as well as video and audio materials available on web pages.		