

VITAMINS AND MINERALS IN HEALTH AND DISEASE	
GENERAL INFORMATION	
Course coordinator	Professor Ljubica Glavaš-Obrovac, PhD
Assistant/Associate	Assistant Professor Barbara Viljetić, PhD Assistant Professor Katarina Mišković Špoljarić, PhD
Study Programme	Integrated undergraduate and graduate university study of Medicine
Status of the course	Elective
Year of study, semester	2 nd year, 4 th semester
ECTS	2
Workload (hours)	Lectures (10); Seminars (15)
Expected number of students	30
COURSE DESCRIPTION	
Course objectives	
The course aims to enable students expanding the knowledge acquired in undergraduate study related to the metabolic function of vitamins and minerals, as well as their role in maintaining of homeostasis in human metabolism, and thus maintaining health.	
Enrolment requirements and entry competencies	
Completed Medical chemistry and biochemistry 1	
Learning outcomes at the Programme level	
1.1., 3.4.	
Learning outcomes (5-10)	
After successful completion of this course students will be able to:	
<ol style="list-style-type: none"> 1. explain the structure and presence of vitamins in the diet, as well as their transport, resorption and impact on metabolic processes 2. comment the presence of minerals in food, their transport and resorption, as well as the impact on metabolic processes 3. critically assess metabolic disorders due to insufficient or excessive intake of vitamins and minerals 4. apply the acquired knowledge about metabolic role of vitamins and minerals in solving specific problems related to pathobiochemical conditions due to insufficient or excessive intake of vitamins and minerals. 	
Course content	
Lectures	
<i>Vitamins:</i> The role of vitamins in metabolism. Water-soluble and fat-soluble vitamins. Vitamin sources. Vitamin digestion, absorption, transport and storage. Vitamin function and mechanism of action. Interactions with other nutrients and drugs. Vitamin metabolism and excretion.	
<i>Minerals:</i> Macrominerals (calcium, phosphorus, magnesium, sodium, potassium, chlorides). Microminerals (iron, zinc, copper, selenium, cadmium, iodine, magnesium, molybdenum, fluorides). Overview of ions in human body. Importance in health in general. The role of minerals in metabolism. Mineral sources. Mineral digestion, absorption, transport and storage. Mineral function and mechanism of action. Interactions with other nutrients and drugs. Mineral excretion.	
Seminars	
Vitamins Recommended Dietary Allowance. Diseases associated with insufficient vitamin intake. Toxicity. Vitamin preparations - benefits and harms. Recommended daily intake. Toxicity.	

Mechanisms of maintaining the concentration of ions in the body. Vitamins and minerals in disease prevention and health promotion.

Mode of teaching

Lectures; Problem-solving Seminars

Student obligations

Attendance at all forms of classes is mandatory and the students are obligated to attend all knowledge tests. The students may be absent from 30% of lectures. Seminars are conducted as a directed discussion, so students should prepare for the seminar in advance

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

Teaching activity	ECTS	Learning outcome	Student activity	Assessment methods	Grade points	
					Min.	Max.
Lectures	0.25	1-4	Class attendance	Attendance record	5	10
Seminars	0.75	4	Preparation of seminar presentation	Seminar presentation	15	40
Final exam	1	1-4	Studying for the final exam	Written exam	30	50
Total	2				50	100

Evaluation of the final written exam:

Percentage of correct answers (%)	Grade points
60.00-64.99	30
65.00-69.99	33
70.00-74.99	36
75.00-79.99	39
80.00-84.99	42
85.00-89.99	45
90.00-94.99	47
95.00-100	50

Calculation of final grade:

Students who achieved 30 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.

Required reading (available in the library and through other media)

Title	Number of copies in the library	Availability through other media
1. R.K. Murray, D.A. Bender, K.M. Botham, P.J. Kennelly, V. W. Rodwell, P.A. Weil. Harperova ilustrirana biokemija, 28 izdanje Medicinska naklada 2011.	30	-

Additional reading

1. Stipanuk, M.H. Biochemical and physiological aspects of human nutrition, W.B. Saunders Co.,2000.
2. Gropper, S.S., Smith, J.L., Groff, J.L. Advanced nutrition and human metabolism, 4th Ed., Thomson-Wadsworth, 2005.
3. Scientific and expert papers related to particular chapters (available online)

Course evaluation procedures

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Medicine Osijek.

Note /Other

E-learning is not included in the class quota, but it is used in teaching and it contains links to various sites and video and audio materials available on websites.