Course ID: HBOI04	**Course name: NEUROCHEMISTRY**		
Cycle: SECOND	**Year: FIRST**	**Semester: I**	**ECTS credits: 4**
Course status: ELECTIVE		**Total course hours: 60** Lectures: 30 Laboratory: 30	
Teaching participants:	**Teachers and associates with expertise in the field of biochemistry and signaling processes**		
Prerequisite for enrollment:	-		
Course aims:	Introducing students to the importance of signal substances in the cell, organ and body.		
Thematic course units:	1. Introduction in neurochemistry; 2. Brain and peripheral nerves; 3. Cells of the nervous system; 4. The concept of synaptic chemical transmission; 5. Electrochemical potential in cell tissue; 6. Nernst's equation and ion channels; 7. Biochemical mechanism of vision; 8. Neurotransmitters: definition, classification, and types of neurotransmitters; 9. Patochemistry and diagnostics of neurotransmitters; 10. Analytical-chemical methods of quantification of neurotransmitters in brain tissue and physiological fluids of humans and animals.		
Learning outcomes:	*Knowledge:* The student will know what makes up the central and peripheral nervous system, he will know the anatomy of a nerve cell, the role of the chemical synapse in the transmission of nerve signals, the anatomy and role of ion channel, types of neurotransmitters and their patochemistry, and the biochemical mechanism of vision. The student will be familiar with the methods of quantification of neurotransmitters in brain tissue and physiological fluids of humans and animals. *Skills:* The student will be able to recognize the roles of central and peripheral nervous system, the role of the chemical synapse, neurotransmitters and ion channels in the transmission of nerve signals. Also, the student will be able to use some of the neurotransmitter quantification methods in brain tissue and physiological fluids of humans and animals. *Competences:* The student will have the competences to discuss about the roles of central and peripheral nervous system, about the chemical synapse, neurotransmitters and ion channels roles		

	in the transmission of nerve signals, as well as about neurotransmitter patochemistry and about medicinal diagnostics.
Teaching methodology:	Classroom lectures and laboratory exercises.
Assessment methods and grading system[1]:	Grading criteria Criteria / Maximal score / Required score 1. Class attendance — 5 — 3 2. Class activities — 10 — 5 3. Midterms — 45 — 25 4. Final exam — 40 — 22 Total — 100 — 55 Scores and grading Score / Grade (B&H) / Grade (ECTS) < 55 — 5 — F, FX 55–64 — 6 — E 65–74 — 7 — D 75–84 — 8 — C 85–94 — 9 — B 95–100 — 10 — A
Literature[2]:	*Mandatory literature:* 1. Siegel G., Albers R.W., Brady S., Price D. (2006) Basic neurochemistry; Molecular, cellular and medical aspects. 7th ed. *Elsevier Academic Press*. Amsterdam... S. Diego... Tokyo. 2. Perry E., Ashton H., Young A. (2002) Neurochemistry of consciousness: neurotransmitters in mind. *John Benjamins Publishing Company*. Amsterdam/Philadelphia. 3. Santos-Fandila A., Zafra-Gomez A., Barranco A., Navalon A., Rueda R., Ramirez M. (2013) Quantitative determination of neurotransmitters, metabolites and derivates in microdialysates by UHPLC–tandem mass spectrometry. *Talanta* 114: 79-89. *Supplementary literature:* 1. Holland B.J., Conlan X.A., Stevenson P.G., Tye S., Raher A., Barnett N.W., Adcock J.L., Francis P.S. (2014) Determination of neurotransmitters and their metabolites using one- and two-dimensional liquid chromatography with acidic potassium permanganate chemiluminescence detection. *Analytical and Bioanalytical Chemistry*, 406(23): 5669-5676. 2. Kim T.H., Choi J., Kim H.G., Kim H.R. (2014) Quantification of Neurotransmitters in Mouse Brain Tissue by Using Liquid Chromatography Coupled Electrospray Tandem Mass Spectrometry. Journal of analytical methods in chemistry. Vol. 2014, Article ID

[1] The grading structure for each subject is determined by the Council of the organizational unit before the beginning of the academic year in which the subject is taught as per Article 64, paragraph 6 of the Law on Higher Education of Sarajevo Canton

[2] The Senate of the higher education institution, as an institution, or the Council of the organizational unit of the higher education institution, as a public institution, determines by a special decision, which is published on its website before the beginning of the academic year obligatory, mandatory and recommended textbooks and manuals, as well as other recommended literature based on which exams are prepared and taken as per Article 56, paragraph 3 of the Law on Higher Education of the Sarajevo Canton

	506870, 11 pages.