שם ומספר הקורס:

Synaptic Neurochemistry

הנוירוכימיה של סינפסות

פרופ' אד שטרן

27-595-01

סוג הקורס: (שיעור)

היקף שעות: 3 שעות סמיסטריאליות

א. מטרות הקורס (מטרות על / מטרות ספציפיות):

The purpose of the course is to familiarize the students with the neurochemistry of the neurotransmitter systems of the Central Nervous System. The course will cover basic concepts of synaptic transmission, neurotransmitter biochemistry and receptor pharmacology.

In addition, a further purpose of the course to provide the students with experience in presenting a research paper for an audience in English. As such, this presentation will determine the grade.

ב. תוכן הקורס: (רציונל, נושאים)

This course will familiarize the students with the basic neurotransmitter systems in the mammalian brain. The emphasis is on the biochemistry, anatomy, physiology, and pharmacology, and functions of the systems.

מהלך השיעורים: (שיטות ההוראה, שימוש בטכנולוגיה, מרצים אורחים)

The course will consist of 10-12 frontal lectures. As the students come from a variety of backgrounds, they will be expected to supplement the course as needed by reading the appropriate chapters from the book: **The Biochemical Basis of Neuropharmacology**, 8th edition, by Cooper, Bloom, and Roth. Other readings and supplements will be given as needed.

תכנית הוראה מפורטת לכל השיעורים: (רשימה או טבלה כדוגמת המצ"ב)

As the students' background is variable, the lecture list is approximate.

אוניברסיטת בר-אילן | רמת גן, מיקוד 5290002 | ישראל
Bar-Ilan University | Ramat-Gan, 5290002 | Israel

מס' השיעור	נושא השיעור	הערות
1	Basic review of synaptic transmission	History of the study of synaptic transmission and neurochemistry, basic concepts of neurochemistry ad pharmacology
2	Research methods in neurochemistry	Overview of the methodologies used to study neurotransmitter systems
3	Chemical neurotransmission: history of concepts, categories of neurotransmitters	Different types of neurotransmitters, how neurotransmitters are categorized: Neuromodulators vs. excitatory and inhibitory neurotransmission.
4	Neuromodulators I: The “first” neurotransmitter: Acetylcholine	Synthesis and removal of Ach. Receptor types: agonists and antagonists. Central cholinergic systems.
5	Neuromodulators II: Dopamine	Synthesis of catecholamines. DA receptor types: agonists and antagonists. Central dopaminergic systems systems.
6	Neuromodulators III: Norepinephrine	NE receptor types: agonists and antagonists. Removal of catecholamines and indolamies.
7	Neuromodulators IV: Serotonin	Synthesis of 5-HT. 5-HT receptor types: agonists and antagonists
8	Neuromodulatory systems	Summary of the different CNS neuromodulatory systems with emphasis on behavioral neuroanatomy.
9	Amino Acid Neurotransmission I: General	Discovery of AA neurotransmitter systems, Glycine, GABA, Glutamate, Aspartate
10	Glutamatergic neurotransmission	Synthesis and removal of Glutamate. Types of glutamatergic receptors: agonists, antagonists
11	GABAergic neurotransmison	Synthesis and removal of GABA. Types of GABAergic receptors: agonists, antagonists
12	Interactions among neurotranmittters	Examples of interactions among neurotransmitter systems in behavior
13	Summary	

ג. חובות הקורס:

דרישות קדם:

חובות / דרישות / מטלות:
The students will be expected to attend the lectures. This will be a factor in the grade, as there is no exam.

מרכיבי הציון הסופי (ציון מספרי / ציון עובר):
The principal determinant of the grade will be a presentation given by the student in English. The presentation will be on a research paper or papers, chosen by the student with the prior approval of the instructor. Topics will be specific to the subject of the course, as determined by the instructor. During the course of the semester, the students will be required to submit the topic ahead of time, and strongly encouraged to discuss the project with the instructor. The student's presentations will be in the final 1/3 of the classes

ד. ביבליוגרפיה: (רשות)

Cooper, Bloom, and Roth: The Biochemical Basis of Neuropharmacology, (Eighth edition), Oxford University Press

ספרי הלימוד (textbooks) וספרי עזר נוספים:

חומר מחייב למבחנים: