COURSE SPECIFICATION
Elective course
(Neurochemistry)
Faculty of Medicine- Mansoura University

(A) Administrative information

(1) Programme offering the course:	Master degree of Basic Medical Sciences in Biochemistry
(2) Department offering the programme:	Medical Biochemistry Department
(3) Department responsible for teaching the course:	Medical Biochemistry Department
(4) Part of the programme:	2nd part
(5) Date of approval by the Department`s council	29/4/2018
(6) Date of last approval of programme specification by Faculty council	
(7) Course title:	Neurochemistry
(8) Course code:	BIC 504 NC
(9) Total teaching hours:	30 hours
(10) Total credit hours:	2 hours

(B) Professional information

(1) Course Aims:

Provide the students with recent data as regard Neurochemistry field, allow also to understand the nature of important neuropsychatric disorders, and provide basis for effective therapy.

(2) Intended Learning Outcomes (ILOs):

On successful completion of the course, the candidate will be able to:

A- Knowledge and Understanding:

AVI.1:

AVI.a: Neurotransmitters and their Receptors

AVI.a.1: Point out that Electric Organs of electric fish are rich sources of cholinergic synapces.

AVI.a.2: Identify that Acetylcholine is released by the Ca –Triggered exocytosis of synaptic vesicles.

AVI.a.3: discussing Acetylcholine Receptor is a Ligand gated cation channel.

AVI.a.4: Identify that Acetylcholine is rapidly degraded by Acetylcholinesterase.

AVI.a.5: Illustrate X-Ray structure of Acetylcholinesterase.

AVI.a.6: Explain how Amino Acids and their derivatives functions as Neurotransmitters.

AVI.a.7: Point out that Neuropeptides are Neurotransmitters.

AVI.a.8: discussing Muscarinic receptors function is mediated by G Proteins.

AVI.b: Excitatory and InhibitoryNeurotransmitters

AVI.b.1: Recognize that Glutamate and Aspartate are Excitatory Neurotransmitters.

AVI.b.2: Identify that Aminobutyric acid and Glycine are Inhibitory Neurotransmitters

AVI.c: Important points as regard Neurotransmitters:

AVI.c.1: Identify That catecholamine Neurotransmitters are derived from Tyrosine.

AVI.c.2: Recognize thatVarious peptides also act as Neurotransmitters.

AVI.d: Biochemical Basis of some neuropsychatric disorders:

AVI.d.1: Explain The events occurring at the neuromuscular junction.

AVI.d.1a: Recognizing that The acetylcholine receptors of the neuromuscular junction is a transmitter-Gated ion channel..

AVI.d.2: Myasthenia gravis :

AVI.d.2a Recognize that Auto antibodies damage Acetylcholine Receptors and reduce their numbers in myasthenia gravis.

AVI.d.2b: Explain that inhibitors of cholinesterase increase the amount of Acetylcholine at the neuromuscular junction, affording treatment for myasthenia gravis .

AVI.d.3: Huntington's disease :

AVI.d.3a: Recognizing that Huntington's disease is genetically transmitted.

AVI.d.3b: Explain The gene for Huntington's disease has been isolated, and the mutation involved is a trinuclestide repeate expansion.

AVI.d.3c: Understanding that Excitotoxins may cause neuronal death in Huntington's disease via their actions on the NMDA subtupe of glutamate receptor.

AVI.d.4: Genetic changes associated with some neurodegenerative diseases:

AVI.d.4a: Understanding that Excitotoxins and other Biochemical mechanisms are involved in brain damage due to stroke.

AVI.d.4b: Recognizing that Mutations in mitochondrial DNA cause some myopathies and neurologic disease.

AVI.d.4c: Understanding that Fragile sites and various chronic neurodegenerative disease are due to trinucleotide repeat expansions.

AVI.d.4d: Understanding that CGG/CCG expansions lead to fragile sites on chromosomes.

AVI.d.4e: Recognizing that Trinuclestide repeat expansion cause a number of chronic neurodegenerative disease.

AVI.d.5: Parkinson's disease:

AVI.d.5a: Identify that signs of Parkinson's disease reflect a deficiency of dopamine and corpus striatum.

AVI.d.5b: Recognizing that Levodopa crosses the Blood-Brain Barrier and is converted to dopamine in the brain, thus providing replacement therapy for Parkinson's disease.

AVI.d.5c: Understanding that Other drugs are useful in the treatment of Parkinson's disease because they affect the metabolism of dopamine or are neuroprotective.

AVI.d.6: Alzheimer's disease:

AVI.d.6a: Illustrate Deposition of amyloid B protein occurs in the brains of individuals with Alzheimer's disease.

AVI.d.6b: Recognizing that Genes involved in Alzheimer's disease have

been isolated.

AVI.d.6c: Define other factors have been implicated in the causation of Alzheimer's disease.

AVI.d.7: Schizophrenia:

AVI.d.7a: Illustrate Genetic, neurodevelopmental, and dopaminergic factors may be involved in the causation of schizophrenia.

AVI.d.7b: Recognize that Genetic linkage studies in schizophrenia have suffered from a lack of replication.

AVI.d.7c: Recognizing that Structural abnormalities that may have developmental basis are observed in the brains of schizophrenics.

AVI.d.7d: Identify that Dopamine has been implicated in schizophrenia, but is not yet resolved.

AVI.d.7e: Define other theories of causation of schizophrenia.

AVI.d.8: Recognizing that techniques are at hand to establish the molecular basis of many neuropsychiatric disorders.

B- Intellectual skills

BVI.1	Formulate a systematic approach for laboratory diagnosis of neurological diseases
BVI.2	Make oral presentation and open discussions about scientific issues in a professional way.

(3) Course content:

Subjects	**No. of Teaching Hours**	
	Lectures	**Laboratory**

1- : Neurotransmitters and the Receptors	**8**	_
2- Excitatory and InhibitoryNeurotransmitters	**7**	_
3- Important points as regard Neurotransmitters:	**7**	_
4. Biochemical Basis of some neuropsychatric disorders:	**8**	
Total Teaching hours	**30**	_

(4) Teaching methods:

4.1: Lecture
4.2: Tutorial
4.3: Seminars

(5) Assessment methods:

5.1:Written Examination for assessment of knowledge and intellectual ILOs
MCQ exam for assessment of knowledge and intellectual ILOs
5.2 Log book for activities for assessment of: mainly for assessment of practical & transferrable skills which are accepted through attending different conferences, thesis discussions, seminars, workshops, attending scientific lectures as well as self learning.
5.3 seminars: the candidate should prepare and present at least one seminar in atopic related to the course and determined by the supervisors in front of the department staff (without marks).

Assessment schedule:
Assessment 1: after 36 month from job registration (written, exam with marks)
Assessment 2 : MCQ exams at the end of each semester
Assessment 3: the candidate should prepare and present at least one seminar in atopic related to the course and determined by the supervisors in front of the department staff (without marks).

Percentage of each Assessment to the total mark:
Written exam: 40 marks
MCQ exam: 10 marks
Other assessment without marks:, seminars and log book assessment are requirement of the 2nd part exam.

(6) References of the course:

6.1: Text books:

- Harper's Illustrated Biochemistry: 24th edition by Murray RK, Granner DK, Mayes PA, Rodwell VW,New York, 1996.
- Biochemistry 3rd edition by Vote D, Vote JG, 2004.
- Biochemistry, 5th edition by Garrett RH, Grisham, 2013.

6.2: Websites:

- http://www.medlib.iupui.edu/ref/biochem.htm
- The Biology Project (from the University of Arizona): http://www.biology.arizona.edu/default.html
- Harvard Department of Molecular & Cellular Biology Links: http://mcb.harvard.edu/BioLinks.html

(5) Facilities and resources mandatory for course completion:

- Lecture rooms: available in the department

Course coordinator: Stuff members of credit committee of the department.

Head of the department: Prof. / Ayman El-Baz.

Date: 29/4/2018