Basic and Clinical Neuroscience (2NF3)

Location: BSB/147; Tue, Wed and Fri 12:30 pm.

Course Outline

Course Instructor: Dr. Ullal, G.

Contact: Department of Psychology, Neuroscience and Behaviour.
Tel. 21331; email: ullalg@mcmaster.ca Room # 108 Psych. Bldg.

Teaching Assistants: To be announced

Office Hours: By appointment with Dr. Ullal or with TAs. Special office hours will be assigned with the instructor and TAs before and after examinations. **Please email with the subject of your email using your McMaster email to schedule an appointment. Emails sent without a subject or using other email accounts will not get a response**.

Course Description and Objectives:

In this course we will be exploring the basic brain mechanisms from ion-channels to complex behavioural tasks with the help of clinical vignetttes. There is no textbook for this course. However, there will be several readings assigned from published papers that will be specifed along with the lecture slides.

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Lectures:

No notes will be provided. Important slides for the lecture will be posted prior to every class on the *Avenue to learn* (available at **avenue.mcmaster.ca**). You may make your own notes in class. You are free to record the lectures.

Evaluations: Two midterm and one final examination.

1. **First midterm examination:** The midterm examinations will be worth **25%** of the final grade. About 90% of the material covered in class prior to 1st midterm examination and 10% from assigned readings will be on 1st midterm examination. Assigned readings will be posted along with the lectures. Besides **multiple choice questions** there will be a few **short answer** type questions comprising of definitions and some important concepts discussed in class. **Date: 7th Feb. 2012**
2. **Second midterm examination:** The midterm examinations will be worth **25%** of the final grade. About 90% of the material covered in class after the 1st midterm examination and prior to 2nd midterm examination and 10% from the corresponding assigned readings will be on 2nd midterm examination. Page numbers of the assigned readings will be posted along with the lecture. Besides **multiple choice questions** there will be a few **short answer** type questions comprising of definitions and some important concepts discussed in class. **Date: 6th March 2012**

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3. **Final examination:** It is worth **50%** of final grade. It will test 90% of the material covered in the entire course and 10% from the entire assigned readings. There will be greater emphasis on what is covered after the 2nd midterm examination. Besides **multiple choice questions** there will be a few **short answer** type questions comprising of definitions and some important concepts discussed in class. Date for the final examination will be determined by the Registrar's Office.

MISSED EXAMINATIONS: There will **NOT** be a re-examination for missing any of the midterm examinations. If a student misses any examination owing to an illness or any other legitimate reason, the final examination will be rated proportionately higher provided an official permission is routed through the University Administration or by filling in the McMaster Student Absent Form (MSAF) as the case may be.

PLEASE NOTE: Students that miss both the midterm examinations for whatever reasons will have to make up for the 2nd examination in the form of an assessment that may be in the form of an examination that may be of a different format or a oral/viva voce with the instructor. **The instructor will determine the format of the examination, date, location and time for such an assessment**. Further, such students should get in touch with the instructor within 48-hours after the missed 2nd examination either in the form of email or meeting personally. In absence of such an arrangement, the mark on the second missed examination will be a "ZERO".

No examination will be re-scheduled unless there is cancellation of the class by the University.

Students considering filling the MSAF forms please note:

If you are absent from the university for a minor medical reason, lasting fewer than 5 days, you may report your absence, once per term, without documentation, using the McMaster Student Absence Form. Absences for a longer duration or for other reasons must be reported to your Faculty/Program office, with documentation, and relief from term work may not necessarily be granted. When using the MSAF, report your absence to psych@mcmaster.ca indicating the course code. You must then contact the instructor/TA immediately (within 2 working days) by email or in person. Please note that the MSAF may not be used for term work worth 30% or more, nor can it be used for the final examination.

CONFLICT OF EXAMINATIONS: Since the midterm examinations are conducted during the regular class-hour, if any other examination conflicts with this examination, please contact the authorities conducting the other examination. The registrar of examinations conducts final examinations.

IMPORTANT ANNOUNCEMENTS: Important announcements regarding the course will be periodically posted in the **"News Items"** of the course. Please remain updated.

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MCMASTER UNIVERSITY GRADING SCALE:

Grade	Equivalent Grade Point	Equivalent Percentages
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	0-49

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SCHEDULE OF LECTURES

NOTE

1. Most of the topics listed below will fbe covered depending on the time constraints.
2. About 90% of the material covered in class and 10% from assigned readings in the text will be on each of the examinations. Assigned readings will be posted along with the lectures.

The general scheme for the lecture topics is as follows:

1. Channelopathies

Ion channels, membrane potentials
X-Ray crystallography
Oocyte techniques
Voltage and patch clamp
Two-photon imaging

2. Multiple sclerosis, Charcot-Marie-Tooth

Conduction of a nerve impulse
MRI, evoked potentials, transgenic techniques

3. Tauopathies and dementias

Cytoskeleton substances, Axon transport
Neuron structure, regeneration, growth cones
Signaling endosome
Neurogenesis, neurotrophic factors
Anatomy and functions of cerebral lobes,
Tests for cognitive impairment, PET, MRI spectroscopy
Conduction studies, Campenot's chamber, growth cone assays

5. Glial tumors

Glial types and functions

Continued

6. Botulism, myasthenic syndromes, epilepsy, Patient-"HM"
Synapse, basic neuroanatomy, neurotransmitters, LTP, LTD, "Kindling" brain plasticity
In vitro slices, EMG, "Brainbows'"
EEG, ECoG, stereoEEG, MEG, neural network modeling

7. Meningitis, hydrocephalus, Rasmussen's encephalitis
CSF, skull and meninges, blood-brain-barrier
Lumbar puncture,

8. "Stroke", upper and lower motor neuron paralysis, Bell's palsy , amyotrophic lateral sclerosis, poliomyelitis apraxia
Cerebral blood flow, 'Pyramidal system', Association fibers.
CT, MRI-tractography, fMRI

9. Aphasias, split-brain, acallosal syndrome
Speech, laterality of cortical functions
Wada's test, Kimura's test, SPECT

10. Movement disorders, Parkinson's disease, Huntington's disease
'Extrapyramidal system' and basal ganglia
PCR, microarray, proteomics

11. Ataxias, nutritional deficiencies, Wernicke-Korsakoff
Kinesthesia, cerebellum

12. Post traumatic strees disorder
Limbic system and HPA axis

13. Insomnia and other sleep disorders
Sleep
Electroculogram

14. "Locked-in syndrome"
Brain stem, spinal cord, consciousness
Assessment of consciousness and Glasgow coma scale

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MIDTERM EXAMINATION DATES:

1st Midterm examination: 7th February 2012
2nd Midterm examination: 6th March 2012

NOTE ABOUT THE FINAL EXAMINATION

- The University will announce dates for the final examination.
- The final examination is **cumulative**. It will cover the **entire material** covered in the lectures (90%) and the entire assigned textbook readings (10%).
- Final examination follows similar pattern as the midterm examinations. There will be both **multiple choice questions** as well as **short answer** type questions on the final examination.

DISCLAIMER

The instructor and University reserve the right to modify elements of the course during the term. The University may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

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NOTE ABOUT ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at http://www.mcmaster.ca/academicintegrity

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
2. Improper collaboration in group-work.
3. Copying or using unauthorized aids in tests and examinations.

Message from the Chair of Psychology

The Instructor cannot be responsible for returning telephone calls from students. Any student wishing to reach an Instructor is invited to e-mail the instructor. Emails should be sent through the McMaster ID indicating the subject of the email.