Neuroscience for Rehabilitation Sciences

Course Coordinator: Shawn Whitehead, Ph.D.
Department of Anatomy & Cell Biology
Bachelor of Health Sciences Program

2013
COURSE DESCRIPTION:

The objective of this course is to develop a working understanding of the function and organization of the central and peripheral nervous system, emphasizing neurological examples encountered by rehabilitation professionals. The course material will be delivered in an integrated manner, relating anatomical organization with physiological function. Information will be reinforced with laboratory experiences, incorporated case studies and a written research report.

Prerequisite(s): Restricted to students in the Occupational Therapy and Physical Therapy programs at the University of Western Ontario or other graduate programs with permission of the course coordinator.

Antirequisite(s): Former Anatomy & Cell Biology (ACB) 530a – Human Neuroanatomy; Former ACB 531A – Neuroscience for Rehabilitation Sciences

COURSE ADMINISTRATION:

The course begins on Tuesday, September 10th and ends on Tuesday, December 3rd, 2013. Lectures are held on Tuesdays and Fridays from 10:30 AM – 12:30 PM in Elborn College (EC) room 1330. On select Fridays, lectures are replaced with laboratory sessions (please see the course schedule for specific details). The labs are held in room 120 of the Medical Sciences Building (MSB). The labs are 2 hours in duration.

COURSE INSTRUCTORS

The course is team-taught by a group of highly-skilled and experienced faculty members representing many areas of neuroscience. While the amount of teaching done by each faculty member will vary, all of the faculty are interested in your success and can be reached for consultation as necessary. Please be aware that as faculty we have a number of responsibilities and may take some time to return email or phone calls. We will do our best, however, to promptly address your concerns.

Dr. Shawn Whitehead (course coordinator)   Shawn.Whitehead@schulich.uwo.ca
519 661-2111 ex. 80440

Dr. Timothy Doherty     Tim.doherty@lhsc.on.ca
519 663-3337 x.33337

Dr. Jonathan Hore     Jon.hore@schulich.uwo.ca
519 661-3817 x.83817

Dr. Derek Mitchell     dmitch8@uwo.ca
519-685-8500 x.32005

ACB 9531A 2013
GRADUATE TEACHING ASSISTANTS
The course has a number of graduate teaching assistants (TAs) that manage the lab sessions and are available for additional help as necessary. The TAs are there to make sure you always have access to one-on-one help as needed. Please take advantage of the TAs knowledge and enthusiasm for the course.

COURSE EVALUATION
The content of the course will be primarily evaluated through the use of multiple choice examinations. In addition, the material studied in the laboratory sessions will be examined in a video/PowerPoint-based exam scheduled during the final exam period. The examinations are cumulative in nature; however, the final exam will have an emphasis upon material covered after the first midterm. All of the laboratory material will be tested during the final lab exam. The evaluation scheme is described in the table below.

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Weight</th>
<th>Due Date</th>
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</thead>
<tbody>
<tr>
<td>Midterm examination</td>
<td>25%</td>
<td>Friday October 25, 2013</td>
</tr>
<tr>
<td>Lab quizzes</td>
<td>10%</td>
<td>Following each lab – short multiple choice quiz</td>
</tr>
<tr>
<td>Laboratory examination</td>
<td>10%</td>
<td>December exam period</td>
</tr>
<tr>
<td>Final examination</td>
<td>40%</td>
<td>December exam period</td>
</tr>
<tr>
<td>Written Assignment*</td>
<td>15%</td>
<td>Due November 15th, 2013</td>
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LABORATORIES:
During each of the five labs, students will have access to live specimens to gain better 3-dimensional understanding and appreciation of the neuroanatomical material covered in lecture. Following each laboratory a short multiple choice quiz will be administered to test material covered in the lab where students will be required to identify neuroanatomical structures. These quizzes are also designed to help students prepare for the final laboratory examination held in December. In addition, clinical case studies will be available on-line for students to practice (no grades will be assigned). These case studies are similar to questions presented during the midterm and final examinations.
ASSIGNMENT:

Choose 1 of the following diseases:

(a) Role of physical therapy for recovery following stroke
(b) Role of physical therapy for recovery following spinal cord injury
(c) Role of physical therapy in patients with Parkinson’s disease
(d) Role of physical therapy in patients with vestibular disorders
(e) Role of physical therapy in patients with Guillain-Barre Syndrome

Write a report describing the following (i) pathology of the disease/disorder; (ii) current physical therapy related management of the disease; and (iii) physical therapy relevant research to improve therapy related management.

• Double spaced
• 1500 words maximum (not including references)
• Due at the beginning of lab on November 15th, 2013

Make sure to accurately cite all your sources. It doesn’t matter what format you choose to use (i.e. MLA etc), as long as you are consistent. Also, please be aware that the class textbook should not be used as the major source of resource.

Citation Styles:

Academic journal articles:


Newspapers/magazines:


On-line article:

MISSED EXAMINATIONS

Only under exceptional circumstances will permission be granted for writing an exam on an alternate date. If the exam was missed due to illness, proper documentation (Western Medical Certificate – see below) is required. This must be delivered to the course coordinator as soon as physically possible. Please note that make-up examinations are written exams including definitions, short and long answer questions.

WESTERN MEDICAL ACCOMMODATION POLICY (Medical Notes)

In May, 2008, The University of Western Ontario’s Senate approved a new medical note policy, which affects all students. The following is an outline of that policy. For more detailed information and forms, please visit https://studentservices.uwo.ca/secure/index.cfm, and for further policy information please visit http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf

Documentation from Family Physicians and Walk-In Clinics: A Western Student Medical Certificate (SMC)* is required where a student is seeking academic accommodation. This documentation should be obtained at the time of the initial consultation with the physician or walk-in clinic. An SMC* can be downloaded under the Medical Documentation heading of the following website: https://studentservices.uwo.ca/secure/index.cfm. Hard copies are available from the student’s home Faculty Academic Counselling Service.

Documentation from Student Health Services: Students obtaining documentation from Student Health Services should sign a “release of information.” This form authorizes Student Health Services to provide information to the student’s home Faculty. Release of information forms are available from, and can be arranged through, the student’s home Faculty Academic Counselling Service.

Documentation from Hospital Urgent Care Centres or Emergency Departments: Students should request that an SMC* be filled out. Students may bring this form with them, or request alternative Emergency Department documentation. Documentation should be secured at the time of the initial visit to the Emergency Department. Where it is not possible for a student to have an SMC* completed by the attending physician, the student must request documentation sufficient to demonstrate that his/her ability to meet his/her academic responsibilities was seriously affected.

*To print or see an example of the Western Student Medical Certificate (SMC) please visit https://studentservices.uwo.ca/secure/index.cfm and click on ‘Student Medical Certificate.pdf’.
TEXTBOOK AND COURSE MATERIAL:

There is no specific text for this course. The course package (lecture outlines, PowerPoint slides and illustrated study guide covering the material for the five neuroanatomy lab sessions, can be found on the course site, delivered through the course management system offered through UWO (located at http://webct.uwo.ca/). Please contact the course coordinator to gain access to the website if you are not registered. Assistance with using the site can be obtained from any of the TAs or the course coordinator.

If additional assistance is required, any quality neuroscience and neuroanatomy text would help elaborate points made in lecture. A number of such texts are available at the Taylor branch of the UWO Library system.

TEXTBOOKS AVAILABLE AT THE LIBRARY

The following list is not meant to be exhaustive or exclusionary. This represents a selection of good quality neuroscience and neuroanatomy texts which would supplement the course material.


Neuroscience : fundamentals for rehabilitation / Laurie Lundy-Ekman. 2nd ed. Philadelphia: W.B. Saunders, c2002


PLAGIARISM:

Students must write their essays and assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

PLAGIARISM CHECKING

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (http://www.turnitin.com).

CHEATING

The University of Western Ontario uses cheating analysis software to assess the validity of examinations written by students. It is the onus of individual students to protect their written work and examination documents.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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| Tuesday September 10, 2013    | • Introduction to the course  
• Organization of the nervous system  
• Cellular components  
• Development of the CNS | Shawn Whitehead      |
| Friday September 13, 2013     | • Synaptic transmission  
• Neurotransmitters and receptors | Shawn Whitehead      |
| Tuesday September 17, 2013    | • Anatomy of the spinal cord  
• Descending pathways | Shawn Whitehead      |
| Friday September 20, 2013     | • Ascending pathways  
• Spinal cord injury | Shawn Whitehead      |
| Tuesday September 24, 2013    | • Anatomy of the medulla, pons and brainstem  
• External features including cranial nerves  
• Relevant internal structures | Shawn Whitehead      |
| Friday September 27, 2013     | • Anatomy of the cerebellum  
• Diencephalon  
• Somatosensory system | Shawn Whitehead      |
| Tuesday October 1, 2013       | • Motor unit classification and recruitment | Tim Doherty         |
| Friday October 4, 2013        | • Motor unit pathophysiology  
• Electrodiagnostic assessment | Tim Doherty         |
| Tuesday October 8, 2013       | • Limb movement / eye movement  
• Vestibular system / vestibulo-ocular reflex | Jonathan Hore       |
| Friday October 11, 2013       | Spinal cord | LAB SESSION 1  
*Medical Sciences Building, room 120* |
| Tuesday October 15, 2013      | • Muscle Receptors  
• Spinal Reflexes | Jonathan Hore       |
| Friday October 18, 2013       | Brainstem and Cerebellum | LAB SESSION 2  
*Medical Sciences Building, room 120* |
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<th>Date</th>
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</table>
| Tuesday October 22, 2013 | • Cerebellum
• Cerebellar Disorders                                           | Jonathan Hore    |
| Friday October 25, 2013  | **MIDTERM EXAMINATION**                                               | Room TBD         |
| Tuesday October 29, 2013 | • Cerebral hemispheres
• Functional considerations
• Subcortical structures, corticothalamic connections
  (white and gray matter)                                      | Derek Mitchell   |
| Friday November 1, 2013  | • Auditory system
• Visual system
• Neglect – object representation                               | Derek Mitchell   |
| Tuesday November 5, 2013 | • Prefrontal cortex
• Language localization
• Cortical lesions – cognitive function                           | Derek Mitchell   |
| Friday November 8, 2013  | • Somatosensory System
• Pain                                                             | Jonathan Hore    |
| Tuesday November 12, 2013 | • Basal Ganglia                                                      | Jonathan Hore    |
| Friday November 15, 2013  | **Cerebrum – external anatomy**                                     | LAB SESSION 3    |
| Tuesday November 19, 2013 | • Meninges
• Arteries of the CNS                                             | Shawn Whitehead  |
| Friday November 22, 2013  | **Cerebrum – internal anatomy**                                      | LAB SESSION 4    |
| Tuesday November 26, 2013 | • Motor Cortex
• Motor Cortex Lesions                                          | Jonathan Hore    |
| Friday November 29, 2013  | • Meninges
• Blood vessels of the brain                                      | LAB SESSION 5    |
| Tuesday December 3, 2013   | • Tremor
• TMS / Plasticity                                                | Jonathan Hore    |