RS 3062b
COURSE OUTLINE

Functional Neuroscience for Special Populations
School of Health Studies
Rehabilitation Sciences
University of Western Ontario
2012

Course Coordinator & Instructor:
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RS 3062  
Functional Neuroscience for Special Populations  
Course Outline

1.0 COURSE INFORMATION

1.1 Prerequisites  
The prerequisites for this course are Biology 1222 or 1223 or Physiology 1021 or equivalent; Health Sciences 2300A/B or Kinesiology 2222A/B or Anatomy and Cell Biology 2221; Registration in the Honours Specialization, Major or Minor modules in Rehabilitation Sciences. It is the student’s responsibility to ensure that they have the necessary prerequisites for this course. If you do not have these prerequisites (or special written permission to take the course), you are not eligible to take this course and you may be removed from this course and it will be deleted from your record. Taking a course without the prerequisite is not grounds for appeal.

1.2 Course Outline  
There are 3 lecture hours per week: Wednesdays, 9:30 to 12:30. Lectures will be held in room 1330 of Elborn College (EC). This course will also feature 2 anatomy laboratory sessions (HSB 322) and 2-3 community volunteer classroom visits. These will all be held during the regular lecture time.

The field of Neuroscience is vast and includes everything from the genetic and cellular level all the way to the behavior of the whole organism. Therefore, it is impossible to cover everything within a single half course. This course will focus on the neuroscience related to major functions that are the focus of rehabilitation practice (e.g. postural control, locomotion, reach to grasp movements) as well as prevalent neurological conditions that are commonly treated by rehabilitation therapists.

The course is broken up into three sections. The first section of the course will cover the relevant anatomy and physiology of the nervous system. This section is supported by opportunities to see prepared specimens of the brain and spinal cord (taught by Dr. Dan Belliveau). This first section serves as the foundation for the second and third sections. The second section will examine some of the major human functions controlled by the nervous system and the third section will focus on neurological diseases and conditions. This section of the course will be supported by an opportunity to listen to first-hand accounts of living with a neurological condition from community volunteers.

The methods of evaluation in this course are described in detail in Section 3.0 below and will include a midterm, anatomy laboratory quizzes, group project and a final exam.

All concerns regarding the course should be directed to the Course Coordinator. Questions regarding specific to content covered in a lecture or a laboratory session should be directed to the instructor who taught the content.

1.3 Neuroanatomy Laboratory Sessions  
The laboratory sessions will be 1.5 hours in length and will run twice during the designated course lecture time. The lab sessions will be held in the Anatatorium (HSB 322). For Anatomy Lab 1, half of the class will attend one session (9:30am to 11:00am) and the remaining half will attend the second session (11:00am-12:30pm). You will be randomly assigned by the course coordinator to one of the
sessions. These assignments will be posted on WebCT. You must attend the session to which you are assigned. The materials to be used during the lab session are limited and keeping the attendance numbers down will ensure that everyone has equal access to them. In the interest of fairness, the order of groups will be reversed for Anatomy Lab 2.

1.4 Course Objectives
1.4.a. To introduce students to the anatomical and functional arrangements of the nervous system at all levels, from cell to systems.

1.4.b. To introduce the neurophysiological basis for functions that are the main focus of rehabilitation interventions.

1.4.c. To introduce major neurological disorders and diseases commonly treated by rehabilitation therapists with an emphasis on issues related to rehabilitation and recovery.

1.4.d. To provide students with an opportunity to learn from and interact with individuals who are living with a neurological condition.

2.0 INSTRUCTOR INFORMATION

2.1 Course coordinator and instructor
Kara Patterson PhD, PT
Assistant Professor, School of Physical Therapy
Office: Elborn College, Room 1408A
Telephone: 519-661-2111 x88845
Email: kara.patterson@uwo.ca

Office hours are by appointment. If you wish to meet, please email me with 3 dates and times that work for your schedule. I will email you to let you know which of the three options work with my schedule.

2.2 Lab instructor
Dan Belliveau PhD
Associate Professor and Undergraduate Chair
School of Health Studies
Office: Health Sciences Building, Room 221
Telephone: 519-661-2111 x88235
Email: dbellive@uwo.ca
### 3.0 METHODS OF EVALUATION

The following is a breakdown of the evaluations in this course.

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>% of Course Mark</th>
<th>Description</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Examination</td>
<td>30%</td>
<td>Up to and including the neuroanatomy lab session on February 8, 2011. Format includes multiple choice, and matching questions and diagram labelling.</td>
<td>February 15, 2012</td>
</tr>
<tr>
<td>Neuroanatomy Lab Quizzes</td>
<td>10%</td>
<td>Administered through WebCT. Two multiple choice quizzes worth 5% each.</td>
<td>February 8 &amp; 29, 2012</td>
</tr>
<tr>
<td>Neuroplasticity Group Project</td>
<td>20%</td>
<td>Written report for rehabilitation therapists about neuroplasticity with respect to recovery and interventions for one of two conditions: stroke or spinal cord injury. Submitted through WebCT and paper copy to instructor.</td>
<td>April 11, 2012</td>
</tr>
<tr>
<td>Final Examination</td>
<td>40%</td>
<td><strong>This is a cumulative final.</strong> Format includes multiple choice, matching, diagram labelling and case studies with multiple choice questions.</td>
<td>TBA</td>
</tr>
</tbody>
</table>

#### 3.1 Midterm Exam (30% of final mark)

The midterm will be 2 hours long and will be held during the regular lecture hours (**February 15, 2012, 9:30-11:30am**). Please wait outside the classroom (EC 1330) prior to the exam start time. The instructor will permit entry into the room once it has been set up for the exam. The midterm will cover all lecture, laboratory sessions and reading material **up to and including** the first neuroanatomy laboratory session on February 8, 2012. The format of the exam will be multiple choice questions, matching questions and diagram labelling. Electronic devices will not be allowed during the midterm exam. The timing of this exam has been carefully considered with respect to the content and the timing of other evaluations in the course. Due to the fact that the course only runs once a week, there is no flexibility in terms of changing the date of the midterm.

#### 3.2 Neuroanatomy Laboratory Quizzes (10% of final mark)

Following each of the two lab sessions, there will be a time-limited WebCT quiz based upon the knowledge acquired during the lab session. The quiz will be multiple choice format. The quizzes are to be completed by **11pm on the day of the lab session**.

#### 3.3 Neuroplasticity Group Project (20% of final mark)

The concept of neuroplasticity is relatively new to the field of neuroscience. The introduction of this concept has had a profound impact on the field of rehabilitation and how therapists approach the treatment of individuals with neurological disorders.
3.3.a) What is required
Students will work in groups of 4 or 5. The group will submit a single written report that could be used as a continuing education manual to update rehabilitation therapists on major concepts related to neuroplasticity and neurorehabilitation with respect to one of two conditions: stroke or spinal cord injury (your choice). The report should be **written as though the report will be read by a rehabilitation therapist** (e.g. physiotherapist, occupational therapist, speech therapist) not a university professor! In other words, imagine that the manager of a stroke or spinal cord injury hospital unit has requested a group of science experts (i.e. your group) to research, design and produce a manual that therapists can use to educate themselves about the latest research on neuroplasticity and the rehabilitation interventions that can influence neuroplasticity. The exact content is up to you, but your report **must include**: 1) a summary of the current research regarding neuroplastic changes that occur after a person has sustained the condition you selected (i.e. stroke or spinal cord injury), 2) scientific evidence of the effectiveness of therapeutic approaches based on the principles of neuroplasticity for the condition chosen and 3) recommendations for clinical rehabilitation practice based on your literature review.

3.3.b) Referencing
The references should be in NLM format with Arabic numbers within the text and the list of references at the end of the report in the order they appear within the main text of the report. You can follow the instructions for authors at the Archives of Physical Medicine and Rehabilitation Journal as a guideline ([http://www.archives-pmr.org/authorinfo](http://www.archives-pmr.org/authorinfo)). A minimum of five (5) references must be used. The references can be from primary articles, review articles, textbooks and/or manuals. You may include **no more than 1 reputable website as a reference** (e.g. Heart and Stroke Foundation of Canada, Rick Hansen Foundation, Society for Neuroscience).

3.3.c) Formatting and Submission
The report must be **1500 words in length**, not including the title page, references and any figures, tables and/or diagrams. **Creativity is acceptable and encouraged!** Reports must be typed and double spaced using Times New Roman or Calibri font. It is due at the beginning of class (9:30am) on **April 11, 2012**. **Late reports will be penalized by 1% off the assigned mark per late hour.** Please submit your report as an electronic file attachment for through WebCT **and** bring a paper copy to class for the instructor.

3.3.d) Evaluation
The report is worth 20% of your final mark. The mark will be composed of the instructor’s evaluation (which will be the same mark for all group members) and a peer evaluation of your contributions to the group (which will be the average of the marks you receive from your group members). The marking scheme for the instructor’s evaluation and peer evaluation will be provided in advance of the due date.

3.3.e) Additional Information
If you require assistance with the research for or writing of this report, please note the following resources available to Western Students. The Student Development Centre offers both one-on-one appointments and drop-in services to assist you with academic writing. You can find out more at [http://www.sdc.uwo.ca/writing/](http://www.sdc.uwo.ca/writing/). In addition, Western Libraries offer assistance with student research needs. You can find out more about this at [http://www.lib.uwo.ca/services/research.html](http://www.lib.uwo.ca/services/research.html)
3.4 Final Examination (40% of final mark)
The final exam is cumulative and will cover all content covered in the lectures, the assigned readings and the neuroanatomy lab sessions. The format will be multiple choice, matching, diagram labelling and case studies with multiple choice questions. The exam will be held during the university final examination period and so the date, time and place will be set by the Registrar’s Office. Electronic devices will not be allowed during the final exam.

4.0 EXPECTATIONS
The most effective learning takes place in an open, safe and respectful environment. We are all responsible for creating this environment. You can expect me to start and end class on time, provide adequate breaks and answer your questions to the best of my ability. I try to encourage questions and discussion during lectures. If I cannot answer your questions in class, I will put every effort in returning an answer during the next class.

I expect you to be on time for class, respect the instructor and your classmates when sharing an idea in class, and listen without disturbing others in class (e.g. talking while others are talking, texting, emailing or other on-line activities). Community volunteers will be coming to class to discuss some very personal experiences. Please show them the respect and consideration due to them when listening to their stories and asking them questions.

5.0 COURSE RESOURCES AND MATERIALS
This course and related materials will be distributed through the course website on WebCT. This includes (but is not limited to) available lecture materials, assigned readings, anatomy lab session materials and lab quizzes. There will also be a required course manual available through the bookstore.

6.0 ADDITIONAL INFORMATION
6.1 Student Code of Conduct
The purpose of the Code of Student Conduct is to define the general standard of conduct expected of students registered at The University of Western Ontario, provide examples of behaviour that constitutes a breach of this standard of conduct, provide examples of sanctions that may be imposed, and set out the disciplinary procedures that the University will follow. For more information, visit http://www.uwo.ca/univsec/board/code.pdf.

6.2 English Proficiency for the Assignment of Grades

6.3 Accommodation for Medical Illness or Non-Medical Absences
http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf
The University recognizes that a student’s ability to meet his/her academic responsibilities may, on occasion, be impaired by medical illness. Illness may be acute (short term), or it may be chronic (long term), or chronic with acute episodes. The University further recognizes that medical situations are deeply personal and respects the need for privacy and confidentiality in these matters. However, in order to ensure fairness and consistency for all students, academic accommodation for work representing 10% or more of the student’s overall grade in the course shall be granted only in those
cases where there is documentation indicating that the student was seriously affected by illness and could not reasonably be expected to meet his/her academic responsibilities.

A UWO 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. Documentation is required for non-medical absences where the course work missed is more than 10% of the overall grade. Students may contact their Faculty Academic Counselling Office for what documentation is needed. Whenever possible, students who require academic accommodation should provide notification and documentation in advance of due dates, examinations, etc. Students must follow up with their professors and their Academic Counselling office in a timely manner. Documentation for any request for accommodation shall be submitted, as soon as possible, to the appropriate Academic Counselling Office of the student’s Faculty of registration. For BHSc students, you may go to the School of Health Studies Office in HSB room 222.

6.4 Scholastic Offences
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 website: http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf.

Additionally,
1. 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).
2. Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

6.5 Support Services
There are various support services around campus and these include, but are not limited to:
1. Student Development Centre -- http://www.sdc.uwo.ca/ ssd/
2. Student Health -- http://www.shs.uwo.ca/student/studenthealthservices.html
3. Registrar’s Office -- http://www.registrar.uwo.ca/
4. Ombuds Office -- http://www.uwo.ca/ombuds/
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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</table>
| 1 January 11, 2012 | Introduction to neuroscience  
Structure of the nervous system  
Neurophysiology of neurons & synapses |
| 2 January 18, 2012 | Peripheral Nervous System  
Autonomic Nervous System  
Spinal Cord |
| 3 January 25, 2012 | Brainstem  
Cerebellum  
Basal ganglia |
| 4 February 1, 2012 | Cerebrum  
Motor and somatosensory system |
| 5 February 8, 2012 | **Anatomy Lab 1**  
9:30am-11:00am – Group A  
11:00am-12:30pm – Group B |
| 6 February 15, 2012 | **MIDTERM** |
| February 22, 2012  | **READING WEEK** |
| 7 February 29, 2012 | **Anatomy Lab 2**  
9:30am-11:00am – Group B  
11:00am-12:30pm – Group A |
| 8 March 7, 2012    | Neuroplasticity  
Reach to grasp |
| 9 March 14, 2012   | Locomotion  
Postural Control |
| 10 March 21, 2012  | Executive functions  
Acquired Brain Injury |
| 11 March 28, 2012  | Spinal Cord Injury  
Community volunteer - ABI |
| 12 April 4, 2012   | Stroke  
Community volunteer – SCI |
| 13 April 11, 2012  | Parkinson’s Disease  
Multiple Sclerosis |