School of Physical and Occupational Therapy
3654 Drummond Street
Montreal, Quebec
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COURSE GUIDE

B.Sc. (PHYSICAL THERAPY) U-2

1999-2000

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U2 CURRICULA PLAN - 1999-2000 - PHYSICAL THERAPY PROGRAM

FALL: TERM A

Academic Term (13 wks) + Exams (2 wks) = Total 15 wks

Academic Term Sept 1 - Dec 3	**Exams** Dec 7 - 21
504-321A CIRCUITRY OF THE HUMAN BRAIN 3cr	
582-455A NEUROPHYSIOLOGY 3cr	
581-337A MOVEMENT III: NEUROMUSCULAR 3cr	
ARTS & SCIENCE COMPLEMENTARY COURSE 3cr	
ARTS & SCIENCE COMPLEMENTARY COURSE 3cr	

WINTER: TERM B

Academic Term (13 wks) + Exams (2 wks) = Total 15 wks

Academic Term Jan 4 - Apr 10	**Exams** Apr 12 - 28
581-328B BIOPHYSICAL AGENTS 2cr	
581-336B MOVEMENT II: CARDIORESPIRATORY 3cr	
581-338B MOVEMENT IV: NEUROLOGICAL 4cr	
581-340B EXERCISE PHYSIOLOGY 3cr	
ARTS & SCIENCE COMPLEMENTARY COURSE 3cr	

SUMMER: TERM C

Clinical 1 (6wks) + Clinical II (6wks) = Total 12 wks

Clinical Block May 1 - June 9	**Clinical Block** June 12 - July 21	**Clinical Block** July 24 - Sept 1
581-320C CLINICAL AFFILIATION II 6cr	581-320C CLINICAL AFFILIATION II 6cr	581-321C CLINICAL AFFILIATION III 6cr
or	**or**	
	581-321C CLINICAL AFFILIATION III 6cr	
	or	

NOTE: 581 - PT
582 - PT/OT

Term A:
Sept. 1 to Dec. 3, 1999
Exam Period:
Dec. 7 to 21, 1999

Term B:
Jan. 4 to Apr. 12, 2000
Exam Period:
Apr. 12 to 28, 2000

Term C:
Two 6-week blocks
May to Sept. 2000

1999-2000 OCCUPATIONAL THERAPY PROGRAM - U2		
Course Number	**Course Name**	**Credits**
504-321A	Circuitry of the Human Brain	3
582-455A	Neurophysiology	3
580-335A	OT Practice II: Neurological Conditions - Part I	2
580-337A	OT Practice III: Psychiatry	3
580-340A	Assessment of Performance II	2
Term A	Arts & Science Complementary Course	3
580-336B	OT Practice II: Neurological Conditions - Part II	4
580-338B	OT Practice IV: Mental Health	3
580-339B	Strategies for Independent Living	2
580-341B	Assessment of Performance III	3
Term B	Arts & Science Complementary Course	3
	TERMS A & B - TOTAL CREDITS	**31**
580-320C	Clinical Affiliation II	6
580-321C	Clinical Affiliation III	6
	TERM C - TOTAL CREDITS	**12**

1999-2000 PHYSICAL THERAPY PROGRAM - U2		
Course Number	**Course Name**	**Credits**
504-321A	Circuitry of the Human Brain	3
582-455A	Neurophysiology	3
581-337A	Movement III: Neuromuscular	3
Term A	Arts & Science Complementary Course	3
Term A	Arts & Science Complementary Course	3
581-328B	Biophysical Agents	2
581-336B	Movement II: Cardiorespiratory	3
581-338B	Movement IV: Neurological	4
581-340B	Exercise Physiology	3
Term B	Arts & Science Complementary Course	3
	TERMS A & B - TOTAL CREDITS	**30**
581-320C	Clinical Affiliation II	6
581-321C	Clinical Affiliation III	6
	TERM C - TOTAL CREDITS	**12**

582-455A - NEUROPHYSIOLOGY

Credits: 3

Lecturer: H. Barbeau (Coordinator), Guest Lecturers

Time: Mondays - 1:30 p.m. - 3:00 p.m.
Wednesdays - 12:30 p.m. - 2:00 p.m.

COURSE STRUCTURE

This course consists of twenty-four 1½ hour lectures.

OVERALL OBJECTIVES

Emphasis will be placed on the understanding of neurophysiological principles, concepts and mechanisms rather than on rote learning, so that the acquired neurophysiological knowledge can be integrated with and utilized in other professional courses.

SPECIFIC OBJECTIVES

Upon completion of this course, the student shall be able to:

1. Identify the various sensorimotor mechanisms at different levels of neuraxis, and relate them to the control of posture and locomotion, as well as to higher functions at the cortical level.

2. Describe the current controversies surrounding the principles of normal development, motor control and dysfunctions, as well as plasticity and readaptation.

3. Analyze the possible neurophysiological and neuropharmacological mechanisms underlying normal and abnormal sensory, motor or cognitive functions in patients suffering from lesions to the central and peripheral nervous system, be they alternations in sensory function or muscle tone, postural disturbances, paralysis, disequilibrium or perceptual impairments.

4. Describe pathophysiology and basis for movement dysfunction for each of the principal neurological disorders presented in the course.

5. Synthesize the knowledge of receptor behavior and the effects of various afferent and supraspinal influences on spinal reflex systems and relate these to (a) existing therapeutic techniques in a comprehensive and analytical manner, as well as to (b) the design of innovative rehabilitation programs.

6. Define the rationale behind treatment approach with a given neurological problem.

7. Master the foundation of knowledge in preparation for the courses, Movement IV: Neurological (581-338B) and Conditions - Neurology (580-335A & 580-336B).

LECTURE SCHEDULE FOR 1999-2000

Section I: Information Processing in the Nervous System **(Chapters from Kandel et al, 1991)**

DATE	LECTURE	PROFESSOR	TOPIC
Wed., Sept. 1	Lecture 1	Dr. Barbeau Dr. David	How is external information translated into the language of our brain? *Chapter 2. Nerve cells and behaviour (pp. 19-32).* *Chapter 3. The cytology of neurons (pp. 34-47).*
Mon., Sept. 6			***LABOR DAY***
Wed., Sept. 8	Lecture 2	Dr. Barbeau	How is information transmitted from one end of the neuron to the other end? *Chapter 6. Membrane potential (pp. 81-89 and 92).* *Chapter 8. Voltage-gated ion channels and the generation of the action potential (pp. 104-114 & 118).*
Mon., Sept. 13	Lecture 3	Dr. Barbeau	Synaptic transmission *Chapter 9. Synaptic transmission (pp. 123-134).* *Chapter 10. Nerve-muscle transmission (pp. 135-152).*
Wed., Sept. 15	Lecture 4	Dr. Barbeau	Neurotransmitters and neurotransmitter release *Chapter 13. (pp. 194-212).* *Chapter 14. (pp. 213-224).* *Chapter 15. (pp. 225-234).*
Mon., Sept. 20	Lecture 5	Dr. Barbeau	Disease of chemical transmission *Chapter 16. Disease of chemical transmission at the nerve-muscle synapse: Myasthenia gravis (pp. 235-243).* *Chapter 56. Disorders of mood: Depression, mania, and anxiety disorders (pp.869-883).*

DATE	LECTURE	PROFESSOR	TOPIC
Wed., Sept. 22	Lecture 6	Dr. Barbeau	How are four sensory attributes - modality, intensity, duration and location - coded and processed in our brain? *Chapter 23. Coding and processing of sensory information (pp. 329-340).*
Mon., Sept. 27	Lecture 7	Dr. Barbeau	Coding of sensory modalities in the somatic system *Chapter 24. Modality coding in the somatic sensory system (pp. 341-352).*
Wed., Sept. 29	Lecture 8	Dr. Barbeau	Touch and Tactile stimulation *Chapter 25. Anatomy of somatic sensory system (pp. 353-364).* *Chapter 26. Touch (pp. 367-384).*
Mon., Oct. 4	Lecture 9	Dr. Paquet	Pain and analgesic mechanisms *Chapter 27. Pain and analgesia (pp. 385-399).*
Wed., Oct. 6	Lecture 10	Dr. Paquet	Vestibular mechanisms *Chapter 33. The sense of balance (pp. 500-511).* *Chapter 43. The ocular motor system (pp. 661-663, 667-670).*
Mon., Oct. 11			***THANKSGIVING***
Wed., Oct. 13	Lecture 11	Dr. Casanova	Physiology of the visual system *Chapter 28. Phototransduction and information - Processing in the retina* *Chapter 29. Central visual pathways* *Chapter 30. Perception of motion, depth and form* *Chapter 31. Color vision*

Section II: Motor Systems of the Brain: Reflex and Voluntary Control of Movement **(Chapters from Kandel et al, 1991)**

Mon., Oct. 18	Lecture 12	Dr. Barbeau	Muscle receptors: the stretch reflex *Chapter 36. Muscles: Effectors of the nervous system (pp. 556-564).* *Chapter 37. Muscle receptors and spinal reflexes: The stretch reflex (pp. 564-580).*

DATE	LECTURE	PROFESSOR	TOPIC
Wed., Oct. 20		Dr. Barbeau	***MID-TERM EXAMINATION***
Mon., Oct. 25	Lecture 13	Dr. Barbeau	The flexion reflex and neural control of locomotion *Chapter 38. Spinal mechanism of motor coordination (pp. 581-590).* ** Neural control of stereotypic limb movements*
Wed., Oct. 27	Lecture 14	Dr. Barbeau	Lesions of the spinal cord, brain stem and stroke *Chapter 46. Clinical syndromes of the spinal cord and brain stem (pp. 711-719; 722-730).* *Appendix B. Cerebral circulation: Stroke (pp. 1041-1049).*
Mon. Nov. 1	Lecture 15	Dr. Barbeau	Spasticity: Underlying mechanisms ** Handbook of the Spinal Cord*
Wed., Nov. 3	Lecture 16	Dr. Cabana	Development of the nervous system *Chapter 21. Development as a guide to the regional anatomy of the brain. (pp. 296-308).*
Mon., Nov. 8	Lecture 17	Dr. Forget	The sensorimotor control of movement *Chapter 35. The control of movement (pp. 533-547).*
Wed., Nov. 10	Lecture 18	Dr. Barbeau	Plasticity in the nervous system *Chapter 18. Reactions of neurons to injury (pp. 258-269).* *Chapter 65. Cellular mechanisms of learning (pp. 1009-1031).*
Mon., Nov. 15	Lecture 19	Dr. Fung	Cerebellar control of movement *Chapter 41. The cerebellum (pp. 626-646).*
Wed., Nov. 17	Lecture 20	Dr. Fung	Supraspinal control of posture ** Postural orientation and equilibrium* *Chapter 39. Posture (pp. 596-607).*

DATE	LECTURE	PROFESSOR	TOPIC
Mon., Nov. 22	Lecture 21	Dr. Paquet	Basal ganglia and Parkinson's disease *Chapter 42. The basal ganglia (pp. 647-659).*
Section III: Higher Cortical Functions **(Chapters from Kandel et al, 1991)**			
Wed., Nov. 24	Lecture 22	Dr. Alonso	Sleep and dreaming *Chapter 51. Sleep and dreaming (pp. 792-804).*
Mon., Nov. 29	Lecture 23	Dr. Ragsdale	The neurobiology of language and aphasias *Chapter 54. Disorders of language: The aphasias (pp. 839-851)*
Wed., Dec. 1	Lecture 24	Dr. Ragsdale	Regional specialization within the two cerebral hemispheres: frontal and temporal lobes. *Chapter 53. Localization of higher cognitive and affective functions: The association cortices (pp. 823-838).* *Chapter 62. Aging of the brain: Dementia of the Alzheimer's type (pp. 974-982).*

REQUIRED TEXT

Course Pack. (Work Book)

SUGGESTED READINGS

Kandel, E.R., Schwartz, J.H. & Jessell, T.M. (1991). *Principles of neural science*. (3rd edition), New York: Elsevier.

Kandel, E.R., Schwartz, J.H. & Jessell, T.M. (1995). *Essentials of Neural Science and Behaviour*. (1st edition), Appleton and Lange, Connecticut.

Netter, F.H. (1991). CIBA Collection of Medical Illustrations Vol. 1, Nervous System Part I: *Anatomy and Physiology* and Part II: *Neurologic and Neuromuscular Disorders*. CIBA-Geigy Corporation.

* Review articles are included in your workbook.

EVALUATION

Mid-Term Examination	IBM single and multiple choice questions (Wednesday, October 20, 1999)	30%
Final Examination	IBM single and multiple choice questions (During exam period December 7-21, 1999)	70%

581-320C - CLINICAL AFFILIATION II
581-321C - CLINICAL AFFILIATION III

Credits: 6 581-320C
6 581-321C

Lecturers: L. Asseraf, E. Lessard, P.A. Wells, Academic Clinical Coordinator (On Leave)

COURSE STRUCTURE

These two courses are the second and third of the five Clinical Affiliation courses which commenced in U1 and continue over the three years of the program. Clinical experience in the various McGill teaching Hospitals or other accredited centres is provided. The student is given the opportunity to practice physical therapy, to observe in other clinical disciplines and participate in teaching rounds and in in-service education. An evaluation of performance is given for each rotation by the supervising therapists who use the clinical assessment form, "***Clinical Performance Instrument***", shown on the following pages. The final evaluations for these rotations will be used to judge the clinical competence of the student in the overall clinical affiliation program. Each of the five clinical affiliations must be passed sequentially.

If a student does not achieve a satisfactory standing on a particular rotation, **IT MUST BE REPEATED AND A SATISFACTORY LEVEL OF ACHIEVEMENT MUST BE OBTAINED.** If a student is unsuccessful in the repeat rotation, he/she will be asked to withdraw from the program. Every effort will be made to arrange the repeat rotation within the three-year period. As this, however, is not always possible, students required to complete an additional clinical rotation should be prepared to convocate in the Fall of the final year. **Please note that only one rotation may be repeated if failed. A failure of any subsequent Clinical Affiliation course will require the student to withdraw from the program.** Satisfactory standing in all required professional courses and clinical placements each year are mandatory to be able to continue in the Physical Therapy program. Students must complete the appropriate professional courses before undertaking the designated clinical course for their level of training. If a clinical placement has to be deferred which would lead to it being completed out of the specified program sequence of professional-clinical-professional courses, the student may not be given permission to take the subsequent professional courses until that clinical placement has been successfully completed. This would lead to delayed graduation.

Please refer to section ***f)*** **of the** ***Academic Advancement*** **in the** ***Academic Regulations.*** These regulations apply to all five clinical affiliation courses given over the three years.

OBJECTIVES

The purpose of the clinical training program is to:

1. provide opportunity for the integration and application of theoretical knowledge of the basic and clinical sciences;

2. encourage the student to make use of all resources to supplement and reinforce the material covered in the academic curriculum;

3. provide guidance in the performance of effective evaluation procedures;

4. develop observational, analytical and interpretive abilities for effective evaluation of the patient and planning of treatment goals;

5. develop student's ability to design appropriate treatment programs and modify them according to the changing status and safety of the patient;

6. develop student's ability to execute effective therapeutic procedures;

7. develop student's organizational ability so as to make optimal use of time;

8. develop qualities necessary for effective interpersonal relationships (with patients, other health care professionals and non-professional staff);

9. develop verbal and written skills;

10. develop professional behaviour in accordance with the existing code of ethics of the O.P.Q.;

11. define and strive for achievable outcomes;

12. use differential diagnosis and predict prognosis.

CONTENT

Neurology, surgery, respiratory, geriatrics, paediatrics, rehabilitation, community care.

Format

The Physical Therapy Program is made up of 105 credits of academic and clinical courses given over three years in seven semesters. The five Clinical Affiliation courses make up over 1000 hours of clinical practice and have a course value of 18 credits. These clinical affiliations start in Term B of Year one, incorporate a summer semester of 12 weeks between Year two and three and finish with a fall and winter block in Year three.

U1	**Winter Term**	**581-220B**	**6 weeks**	**0 credits**
U2	**Summer Term**	**581-320C**	**6 weeks**	**6 credits**
U2	**Summer Term**	**581-321C**	**6 weeks**	**6 credits**
U3	**Fall Term**	**581-420A**	**5 weeks**	**3 credits**
U3	**Winter Term**	**581-421B**	**5 weeks**	**3 credits**

Clinical Session Dates - 1999-2000

U1	**Session I**	**March 20 - April 28, 2000**
U2	**Session II***	**May 1 - June 9, 2000**
U2	**Session III**	**June 12 - July 21, 2000**
U2	**Session IV**	**July 24 - September 1, 2000**

***Only two of the three sessions in the Summer Term must be completed by U2 students.**

U3	**Session V**	**November 15 - December 17, 1999**
U3	**Session VI**	**January 4 - February 4, 2000**

DRESS CODE

Each student is responsible to purchase the following for use in the clinical setting: full length navy blue pants; white top either polo style or shirt with sleeves; plain white or navy sweater may be worn over the shirt. Walking shoes (no canvas shoes or sandals) and matching socks are required. An identification tag (purchased through the Students Society) is compulsory and must be worn on the outside of the shirt or sweater at all times when in the clinical setting.

REFERENCE MATERIALS

As required by the particular rotation and clinical instructors during the affiliation.

HOSPITAL EVALUATION

For each rotation the student is required to complete the "Student Evaluation of Hospital Affiliation" form. The completed form must be handed to the Centre Coordinator of Clinical Education on the last day of the rotation. As well, students must complete a self evaluation form.

STUDENT EXPERIENCE BOOKLET

During the clinical program the students are required to complete the appropriate clinical experience sheet. The booklet is made available in March of the first year of studies and must be picked up from Room D20 by March 15. The student is responsible to enter the information on each rotation and present it to the next hospital. **Following completion of the final rotation in U3 the completed booklet must be returned to the Academic Coordinator of Clinical Education, Room 7, Davis House. Failure to do so may result in a delay of final clinical mark and graduation.**

HOSPITAL HANDBOOK

Prior to (**one week before**) the beginning of a rotation the student must obtain the Hospital Handbook from the Main Office (D20). The student is expected to read it before the start of the rotation.

IMMUNIZATION

Reminder: All students must have obtained the immunization card from the McGill Student Health Services before entering the first clinical placement. This card indicates that the student has the necessary inoculations for clinical practice. The card must be presented to the Centre Coordinator of Clinical Education on the first morning of each clinical practice period.

Failure to complete the required tests before the Clinical Periods will result in the student being unable to enter the clinical setting.

CARDIOPULMONARY RESUSCITATION

Reminder: It is compulsory that all students have a valid up-to-date CPR certificate before entering each clinical placement. This certification must be maintained over the three years of the program.

Failure to attain a valid CPR certificate before the Clinical Periods will result in the student being unable to enter the clinical setting.

581-328B - BIOPHYSICAL AGENTS

Credits: 2

Lecturers: M.A. Dalzell (Coordinator), M. Kosiuk, Guest Lecturers

COURSE STRUCTURE

This course will be given in lecture, practical and workshop formats over 13 weeks of Term B starting the week of January 4, 2000. The practical/workshop sessions will be held at the École de réadaptation, Room 4032, 4th Floor, Université de Montréal, 2375 Côte St. Catherine Road, Montréal, H3T 1A8.

GOALS AND OBJECTIVES

This course is designed to introduce the student to the latest technology available in the use of Biophysical Agents for orthopaedic and neurological conditions. The presentations will incorporate case-based and evidence-based practice modes.

I. Thermal Modalities

The student shall be able to:

1. Take precautions and be aware of contraindications to treatment with thermal and electrical modalities.
2. Discuss the physiological effects of thermal modalities including hot packs, ice massage, short wave diathermy, magnetic therapy and contrast baths.
3. Compare the therapeutic benefits of applying cold versus heat-generating modalities.
4. Be technically adept at applying the thermal modalities available to real or simulated models.
5. Choose appropriate thermal modalities as an adjunct to treatment of common muscoloskeletal conditions.
6. Choose appropriate thermal modalities as an adjunct to treatment of neurological conditions.
7. Discuss safety standards with respect to the use of electrical equipment.

II. Ultrasound

The student shall be able to:

1. Discuss the thermal and non-thermal effects of ultrasound.
2. Discuss the physiological effects of modifying insonation parameters of treatment including frequency, intensity, insonation intervals, and duration of each application.
3. Be technically adept at applying ultrasound to real or simulated models.

4. Prescribe appropriate insonation parameters for treatment of common musculoskeletal conditions.
5. Recognize contraindications or precautions to treatment with ultrasound in various patient populations.

III. Laser Therapy

The student shall be able to:

1. Discuss the physiological effects and indications of low power medical lasers.

2. Demonstrate the technical details of application of laser therapy to real or simulated models.

3. Recognize contraindications or precautions to treatment with laser therapy in various patient populations.

IV. Electrical Stimulation

The student shall be able to:

1. Discuss safety standards with respect to the use of electrical equipment.

2. Understand the theories underlying the application of electric currents for therapeutic purposes.

3. Integrate past knowledge and skills with new knowledge and electro-therapeutic techniques so as to effectively evaluate, plan, and treat patients with whatever resources are available.

4. Compare sensory and motor nerve responses to electrical stimulation.

5. Discuss the mechanism of activation of normally innervated muscle by an electrical current.

6. Discuss the mechanism of activation of denervated muscle by an electric current.

7. Modify the perception of acute and chronic pain by choosing appropriate electrical stimulation parameters (TENS).

8. Modify the perception of acute and chronic pain by applying the electrodes in locations related to the underlying pathology or locations which have been shown to be effective in pain modulation.

9. Describe the current wave forms, temporal characteristics and the physiological effects of various low and medium frequency electric currents (TENS, FES, diadynamic and interferential currents).

10. Prescribe the appropriate currents available on electrotherapeutic units as a form of treatment in more common musculoskeletal conditions.

11. Technically apply TENS, functional electrical stimulation (FES), diadynamic and interferential currents to real or simulated models with a variety of real or simulated disorders of function.

12. Compare the physiological effects of an electrically induced muscle contraction with a voluntary muscle contraction.

13. Compare the physiological effects of electrical stimulation of innervated versus denervated muscle.

14. Prescribe functional electrical stimulation protocols of treatment for patients in need of muscle re-education or strengthening.

15. Appropriately apply electrodes to muscles in order to achieve a maximal contraction.

16. Identify the signs and symptoms of peripheral nerve degeneration and regeneration and how these changes can be detected by electro-diagnostic testing.

17. Describe and interpret the recording principles of Electromyography.

18. Discuss the basic principle of currently employed biofeedback applications in terms of their anatomical and physiological correlates.

19. Given a real or simulated patient, be able to demonstrate biofeedback strategies which can be used for treatment.

20. Design a home program where indicated to instruct the patient and family in the functional application of the modality and the precautions to be taken with use.

COURSE CONTENT

The sequence of lectures, workshops and practicals (subject to availability of equipment) is as follows:

- Role of Biophysical Agents in Orthopaedics and Neurology
- Cryotherapy and the Physiological effects of cold
- Electroshock
- Therapeutic heat: Superficial/Deep
  Physiological effects of Heat
- Ultrasound
  Physiological effects and indications for use
  Dosage parameters and modifications
- Laser Therapy
- Theory of Electrical Stimulation
  Inflammation and Healing of soft tissue using low frequency currents
- Sensory stimulation
  TENS
- Motor stimulation
  Stimulation of Innervated and Denervated Muscle
  Functional Electrical Stimulation (FES)
- Diadynamic/Interferential Current Therapy
- Biofeedback, clinical applications
- Modality combinations, case studies

DRESS CODE

Shorts for all laboratory classes.

REQUIRED TEXT

Michlovitz, S. (Editor). (1990). *Thermal Agents in Rehabilitation*. (2nd edition). Philadelphia, F.A. Davis Company.

EVALUATION

Mid-Term examination - Written	15%
Final Examination - Written	45%
Final Practical Examination	40%

581-336B - MOVEMENT II: CARDIORESPIRATORY

Credits: 3

Lecturer: J. King, J. Soicher

COURSE STRUCTURE

This course will consist of lectures/seminars and laboratory sessions.

GOAL

The goal of this course is to integrate and apply the knowledge of anatomy, physiology and neurophysiology to the management of the cardiopulmonary patient. The focus of this course will be on the assessment and treatment procedures for acute and chronic cardiopulmonary diseases occurring across the life span.

OBJECTIVES

By the end of the course, the students will be able to:

1. evaluate a patient's cardiopulmonary status;
2. design a treatment program based on problems identified during patient assessment;
3. effectively perform physiotherapy techniques used in cardiopulmonary care;
4. modify treatment plans based on patients' response to previous interventions.

REQUIRED TEXTS

Irwin, S. And Tecklin, J.S. (1995). *Cardiopulmonary Physical Therapy*, (3rd edition). Mosby Co.

Course Guidelines. These can be purchased on the first day of class. The package provides the objectives for each lecture and lab session, lists the required readings for each lecture and supplies some assessment and treatment guidelines.

It is ESSENTIAL that you thoroughly review your cardiorespiratory system anatomy and physiology before starting this course. There will not be a formal review of these topics but you will be expected to apply this knowledge throughout the course.

RECOMMENDED READING

Frownfelter, D. & Dean, E. (1996). *Principles and Practice of Cardiopulmonary Physical Therapy*, (3rd edition). Mosby Co.

MacKenzie, C.F. (1981). *Chest Physiotherapy in the Intensive Care Unit*. Baltimore/London Williams & Wilkins.

Webber, B.A. (1988). *The Brompton Hospital Guide to Chest Physiotherapy*, (5th edition). Blackwell Scientific Publications.

West, J.B. (1995). *Pulmonary Physiology*, (5th edition). Williams & Wilkins.

West, J.B. (1987). *Pulmonary Pathophysiology - The Essentials*. Williams & Wilkins.

EQUIPMENT REQUIRED

A stethoscope and a watch with a second hand.
You must have these for the labs on assessment in the first week of class.
The stethoscope can be purchased at the bookstore.

DRESS CODE

Shorts and a t-shirt should be worn for all practical labs.

EVALUATION

The evaluation procedures for this course will be handed out at the first class.

581-337A - MOVEMENT III: NEUROMUSCULAR

Credits: 3

Lecturers: E. Deckelbaum, J.P. Dumas, F. Ianni

COURSE STRUCTURE

This course is divided into three sections:

Section 1 and 2 incorporate theoretical/seminar/practical sessions on clinical assessments and applications of orthopaedic and neurological principles to the management of clients with spinal dysfunction across the life span. Specific therapeutic management approaches will be presented as models for patient care back programs.

Section 3 incorporates the lecture series given in Section A of course 580-337A - OT Practice III: Psychiatry.

Section 1: **THE SPINE** E. Deckelbaum
Lecture and laboratory sessions - 4 hours per week for 13 weeks
Tuesdays and Thursdays 2:30 to 5:00 starting September 2, 1999
Section description and evaluation methods will be handed out at the first class.

Section 2: **MANUAL THERAPY- VERTEBRAL** J.P. Dumas
This is the second of the three course series in Manual Therapy for qualification to write the E1/V1 exam.
Lecture/seminar/practical sessions - 4 hours per week for 13 weeks
Thursdays 8:30 - 12:30 starting September 2, 1999
Section description and evaluation methods will be handed out at the first class.

Section 3: **PSYCHIATRIC CONDITIONS** (Section A, 580-337A) F. Ianni
Lecture sessions - 2 hours per week for 9 weeks
Section description and evaluation methods will be handed out at the first class.

COURSE OBJECTIVES Section 1 and 2

Strategies for the evaluation and management of spinal dysfunction across the lifespan will be explored using specific management approaches.

Upon completion of these two sections, the student will have acquired the skills and behaviours to:

1. develop strategies for evaluation and treatment of spinal dysfunction based on the management techniques and modalities covered in each section;
2. incorporate a comprehensive understanding of anatomy, physiology and pathology supporting a holistic and integrated approach to the physical therapy management of spinal dysfunction;
3. select and administer appropriate evaluative tests and measures for different types of spinal dysfunction;
4. interpret the evaluative responses to determine the management approaches to be used based on the management techniques and modalities for which there is evidence of efficacy.

COURSE OBJECTIVES Section 3

On completion of this section the student will be expected to:

1. recognize the signs and symptoms of psychiatric disorders;
2. understand the theories of etiology;
3. be familiar with medical treatment (i.e., pharmacological, physical, psychotherapeutic).

Note: For a more detailed description of this section, please refer to Section A: Psychiatric Conditions in course 580-337A - OT Practice III: Psychiatry.

REQUIRED TEXTS

Section 1 Course Notes - Available September 2, 1999
TREAT YOUR OWN BACK - Robin Mckenzie, Spinal Publications, New Zealand
TREAT YOUR OWN NECK - Robin Mckenzie, Spinal Publications, New Zealand

Section 2 Course Notes - to be purchased the first day of class - approximately $12.00

Section 3 Kaplan and Sadock. (1994). *Synopsis of Psychiatry*. Williams and Wilkins.

EVALUATION

Section		Mark Values
Section 1	The Spine	50%
Section 2	Manual Therapy - Vertebral	40%
Section 3	Psychiatric Conditions	10%

581-338B MOVEMENT IV: NEUROLOGICAL

Credits: 4

Lecturers: J. Fung (Coordinator), N. Paquet (Laboratory)
Guest Lecturers, Medical & Neurorehabiltation Specialists

COURSE STRUCTURE

This course is divided into two sections, the first is given in Term I and the second in Term II.

Term I (Fall)	**Section 1:** Neurological Seminar Series
Term I & II (Fall & Winter)	**Section 2:** A Functional Approach to Posture and Movement Training
Term II (Winter)	**Section 3:** Neurorehabilitation Lectures and Labs

OVERALL GOAL

The overall goal of this course is to provide the students with an understanding of:

1. the underlying pathophysiology; and
2. the principles of rehabilitation in the treatment of adult and pediatric neurological disorders across the life span.

SECTION 1: NEUROLOGICAL SEMINAR SERIES

Coordinators: Barbara Mazer
Nicole Paquet

STRUCTURE

Place: To be announced
Time: Mondays and Wednesdays - 3:30 p.m. to 5:00 p.m.
Dates: September 1 - December 1, 1999

OBJECTIVES

The student will be able to:

1. Describe the etiology, pathology, and signs and symptoms of common neurological diseases.

2. Outline the medical and/or surgical approach to treatment of neurological diseases.

COURSE FORMAT

Two different formats will be used in this course:

- Twelve 1½ hour lectures on a specific neurological condition or problem will be included.
- Five 1½ hour self-directed learning sessions (20-25 students per group) will be led by a group facilitator.

Students will be expected to read all the assigned texts before coming to class. In addition, students will have to submit their homework before each lecture.

A Course Outline will be handed out on the first day of class. Topics will include:

- Essentials of the neurological examination
- Neuroembryology
- Cerebral palsy
- Encephalopathy
- Cerebro vascular accident
- Head injury
- Multiple sclerosis
- Movement disorders
- Dementia
- Neuropathy
- Muscular dystrophy
- Visual impairments
- Speech - Communication - Language disorders
- Learning disabilities
- Autism
- Post-polio syndrome
- Spinal Cord Injury
- Spasticity
- Vestibular disorders
- Ataxia
- Meningitis
- Epilepsy
- CNS Tumor

REQUIRED TEXTS

Perkins, G.D. (1998). *Mosby's Color Atlas and Text of Neurology*. Mosby-Wolfe.

Course Pack.

EVALUATION

This course section is worth 20% of the overall mark for PT Movement IV: Neurological (581-338B) and for OT Practice II: Neurological Conditions (580-335A).

Section I: Conditions	Quizzes	13%	
	Group sessions		5%
	Homework	2%	

SECTION 2: A FUNCTIONAL APPROACH TO POSTURE AND MOVEMENT TRAINING

STRUCTURE

This section will span both A and B Term. In Term A it will consist of 26 hours of lecture/seminar/practical to be given:

Thursdays, October 14 and 21, 1999 from 6:00 p.m. to 9:00 p.m.
Fridays, October 15 and 22, 1999 from 6:00 p.m. to 9:00 p.m.
Saturdays, October 16 and 23, 1999 from 8:30 a.m. to 4:30 p.m.

In Term B, 9 lab hours will be incorporated into Movement IV: Neurological.

COURSE DESCRIPTION

Motor learning and neuromuscular training are essential components of quality patient management as most patients with orthopaedic and/or neurological conditions manifest postural and movement dysfunctions.

This manual therapy course emphasizes a functional approach to dynamic postural control and efficient movement training, which may be a necessary later stage learning component of motor skill acquisition. This systematic approach to neuromuscular control addresses the whole kinetic chain (i.e., the trunk along with the extremities) when educating, guiding and training a patient towards optimal human performance.

After identifying postural and movement dysfunctions through observational and manual assessment skills, the student therapist will learn to guide the patient in a training program which facilitates the necessary awareness, strength, endurance, flexibility, and coordination needed to accomplish key functional tasks critical for that patient's higher achievement towards independence (e.g., wheelchair transfers, ambulation) or his maximal performance of his stated goals (e.g., work activities, sport activities).

OBJECTIVES

Given a real or simulated patient or a case study, the student will be able to:

1. Describe and utilize current basic principles and specific techniques of manual therapy (with a primary emphasis in proprioceptive neuromuscular facilitation) as a mechanism for evaluation of posture and movement, including the manual assessment and analysis of various characteristics of neuromuscular control on any involved part of the trunk or extremities.

2. Demonstrate current basic principles and specific techniques of manual therapy on efficient strategies of posture and movement, including the use of various functional positions and functional learning activities, for minimizing identified dysfunctions and enhancing optimal human performance (i.e, the precise functional tasks identified for maximal independence and/or for specific goal achievement).

3. Integrate this course material with other learned course material from current or previous courses, such as:

    a. Explain, and modify as necessary, the physical therapy assessment for a patient with an orthopedic condition or a neurological condition.
    b. Assess a patient's functional status and determine a list of primary areas of function and dysfunction.
    c. Write measurable functional goals based on the analysis of the patient's critical functional needs.

d. Describe a comprehensive treatment approach, including all important aspects of rehabilitation and other treatment management possiblities, other than just the manual therapy approach learned in this course.

COURSE CONTENT

A detailed course outline will be distributed at the beginning of the course. The primary focus will include working through selected case studies with an emphasis on problem-solving skills, patient management skills, and specific manual therapy skills.

REQUIRED TEXT

Course Pack.

EVALUATION

The material covered in this section will be examined in the final OSCE as an integrated unit of neurorehabilitation.

SECTION 3: NEUROREHABILITATION LECTURES AND LABS

STRUCTURE

Place: Coach House Gymnasium and selected rehabilitation sites
Time: Mondays, Wednesdays and Fridays, 9:00 a.m. - 12:00 Noon
Dates: January 5 - April 10, 2000

OBJECTIVES

Following attendance and active participation in the class, the student will be able to:

1. Recognize the principles of neurological rehabilitation across the life span and explain the underlying assumptions and scientific basis.
2. Appraise how the motor, cognitive, language and social domains interact with each other during development, in motor learning and throughout the aging process.
3. Explain the current controversies surrounding the principles of normal development, motor control and dysfunctions, as well as plasticity and readaptation.
4. Demonstrate skill and competence in the assessment of different neurological disorders.
5. Formulate treatment goals which are client-centered, objectively measurable, realistic and functional for the client to achieve.
6. Formulate a treatment plan and demonstrate skill and competence in carrying out the treatment.
7. Measure the outcomes and evaluate the effectiveness of treatment.
8. Explain the rationale behind any treatment approach with a given neurological problem.
9. Modify and progress treatment based on environmental, social, psychological and medical factors.
10. Develop problem-solving skills to prepare for clinical rotation in neurorehabilitation.
11. Integrate basic neuroscience concepts and kinesiology principles with physical rehabilitation.
12. Demonstrate both oral and written skills in case presentation and problem solving.

13. Explain the essential pathophysiology and basis for movement dysfunction for each of the principal neurological disorders discussed in the course.

It is imperative that the student has mastered the foundation of knowledge previously acquired from the Neuroanatomy and Neurophysiology courses, as well as the Neurological Seminar Series (Section 1) in the fall term. The student will be expected to refer back to their course notes and be prepared to answer questions on materials previously covered.

COURSE FORMAT

Nine hours of lectures, workshops, practical laboratories and rehabilitation site visits will be conducted on a weekly basis for a total of 12 weeks. The last week is reserved for course review and group practice to prepare for the final OSCE. Lectures are given in didactic settings for students to acquire basic knowledge and information. Workshops emphasize group participation, interaction and problem-based learning. Practical laboratories emphasize practice of assessment and treatment skills, usually in small groups of two or four. Lectures and workshops are given by the course coordinator and guest lecturers who are experts in the field. Practical labs are conducted by the lab coordinator and TAs. A variety of clinical rehabilitation settings (paediatric and adult, acute and intensive) have been selected for live case demonstrations. The cases are presented by experienced therapists who are specialists in the field. Cases which are videotaped can be reviewed throughout the course.

COURSE OUTLINE

To be handed out on the first day of class.

REQUIRED TEXTS

Chedoke-McMaster Stroke Assessment Manual. (1995). Chedoke-McMaster Hospitals and McMaster University.

Shumway Cook, A. and Woollacott, M. (1995). *Motor Control. Theory and Practical Applications*. William & Wilkins.

Course Packs :
1. Reference readings
2. Course Notes
3. Lab Manual

EVALUATION

Section 1:	20%
Sections 2 & 3:	
Mid-term Examination	20%
Written Clinical Case Report	10%
Final OSCE	50%
Total course mark	**100%**

A grade of at least C+ must be obtained in each section and in the final OSCE, in order to pass the course.

581-340B - EXERCISE PHYSIOLOGY

Credits: 3

Lecturers: P. McKinley (Coordinator), D. St-Pierre, Guest Lecturers

The purpose of the course is for the student to understand the physiological responses to exercise testing and training across the life span and to apply this knowledge to meet specific therapeutic goals.

COURSE STRUCTURE

This course will be given on Mondays and Wednesdays 1:30 p.m. - 3:30 p.m.

Part I: ***Cardiorespiratory Physiology In Relationship To Exercise***
P. McKinley - January 5 to February 14, 2000

Part II: ***Neuromuscular Adjustment To Exercise And Training***
D. St. Pierre - February 16 to March 13, 2000

Part III: ***Case Presentations***
Student teams - March 15 to April 10, 2000

OBJECTIVES

On completion of the course the student should have accomplished the objectives for each of the four identified domains below as related to the musculoskeletal and respiratory and cardiovascula4r systems.

I. Physiological effects on the musculoskeletal, cardiovascular and respiratory systems

1. *Describe* the acute and long term responses of the cardiovascular, respiratory and musculoskeletal system to both endurance and strength training.

2. *Discuss* the adaptation of these systems to exercise training and detraining (both aerobic and anaerobic training).

3. *Describe* the specificity of exercise as it relates to:
   a. respiratory muscle training
   b. endurance training
   c. strength and power training
   d. muscle plasticity

4. *Explain* the differences in physiologic responses to exercise across the life span.

5. *Describe* the physiological effect of dietary and drug supplements on the exercise response.

II. Cellular metabolism at rest and during exercise

1. *Describe* the contribution of specific metabolic pathways to energy production.

2. *Explain* the effects of exercise mode and intensity on substrate utilization in aerobic and anaerobic metabolism.

3. *Discuss* the role that environmental stress (hyperbaric and hypobaric heat and cold) can have on the cellular metabolism and its physiologic adaptations.

III. Applied exercise physiology

1. *Describe* the development and implementation of an exercise prescription to improve health for:
   a. A normal population.
   b. Specific pathologies (to include neuromuscular, cardiovascular, respiratory, metabolic, developmental and geriatric).

2. *Discuss* the effects of pathology, environment and lifestyle on the exercise response and relate ways in which to adapt an exercise prescription to address these effects.

3. *Discuss* methods for maximizing compliance over the long-term, including social facilitation, community resources and psychology.

4. Determine and justify the appropriate protocol to assess the exercise status in a variety of populations and be able to use this information to monitor outcome.

IV. General skills and behaviors

1. *Carry out* a literature review, demonstrate library skills, write purposefully and prepare a specific report to include graphic representation, argument synthesis and relevant information. Present an oral report on the topic.

2. *Learn to collaborate* effectively with peers in the creation and presentation of a specific report.

3. *Become a critical consumer* of the literature with the goal of applying the knowledge to clinical practice.

4. *Define* problems present and anticipated from the client's perspective and his/her occupation and lifestyle.

5. *Determine* how interventions may be modified based on evaluative tools.

REQUIRED READINGS

Course Pack.

RECOMMENDED TEXTS

McArdle, W.D., Katch, F.I. and Katch, V.L. (1996). *Exercise Physiology*, (4th edition). Williams and Wilkins.

EVALUATION (To be confirmed first day of class)

Mid-term Examination	50%	(on all lecture material) (Week of March 13, 2000)
Case Presentation		
Written Report	15%	
Presentation	10%	
Final Examination	25%	(Using principles of exercise physiology in application to clinical populations as covered in case presentations) (During exam period April 12-28, 2000)