

## SYLLABUS

<b>NAME OF COURSE:</b>	NMS Diagnosis and Management (DIAG-416)
<b>LENGTH OF COURSE:</b>	33 hours (3 hours lecture/week), 3.0 units
<b>COURSE DESCRIPTION:</b>	This course is designed as a synthesis class concerning neuromusculoskeletal diagnosis and management. The course will serve to review and integrate knowledge and skills previously covered in the curriculum. Selected topics will be chosen from among the common clinical conditions affecting the cervical spine, lumbar spine, pelvis, and extremities.
<b>PREREQUISITES:</b>	DIAG-340 DIAG-317
<b>COURSE OFFERED BY:</b>	Clinical Science Department
<b>REQUIRED TEXT:</b>	<u>NMS Dx &amp; Management Class Notes</u> – M.J.T. Fitzgerald, Jean Folan-Curran Clinical Neuroanatomy and Related Neuroscience. 4 <sup>th</sup> Edition or 6 <sup>th</sup> Edition

**RECOMMENDED TEXTS:** \* National Board of Chiropractic Examiners reference texts

Beck R (2008) Functional Neurology for Practitioners of Manual Therapy

\*Patten, J (1996) Neurological Differential Diagnosis

Blumenfeld H. Neuroanatomy through Clinical Cases, 2<sup>nd</sup> ed. 2011

\*Waxman, S. (2003) Clinical Neuroanatomy (25<sup>th</sup> ed.)

\*Greenberg, D., et al. Clinical Neurology 6<sup>th</sup> ed. 2005

Souza T. Differential Diagnosis and Management for the Chiropractor 4<sup>th</sup> ed. 2009

Stanley Hoppenfeld, Orthopedic Neurology

**REFERENCE TEXTS:** Atlas of Human Anatomy – 4<sup>th</sup> 2006 edition, Netter.  
Durrant and True, Myelopathy, Radiculopathy, and Peripheral Entrapment Syndromes 2002

**MATERIALS:** none

**METHOD OF INSTRUCTION:** lecture, discussion, assignments (in-class & take-home). It is highly recommended that you plan at least one hour per day of study per day.

**EVALUATION:** Examinations may consist of a combination (in any proportion) of multiple choice.

Midterm Examination	34 points
Final Examination (cumulative)	80 points
Class Project	5-10 points

If you do poorly on the midterm you can excel on the final

**Assignments (take-home):** These are used to test you're knowledge of subject matter and ability follow instruction. **Assignments must be handwritten and legible. They will be graded as correct or incorrect, then handed back to you with suggested study to learn from.** **Students who participate in homework assignments have a higher percentage of passing the course.**

Assignments are due at the start of class

Class project: The assignment requires the creation of a fictitious patient you are treating who needs to be referred for EMG/NCV testing via her primary care MD for insurance purposes. You will be writing a letter (on your letterhead) to the primary MD requesting participation in the treatment plan you envision. Your referral letter will need to include the following bullet points: Case history, clinically relevant findings, diagnosis and response to care with a rational as to why the test is needed. It will need to include the salient findings of the EMG and NCV exam (what are the conduction values, compound action potentials, insertional activity etc) and

the significance of the finding(s).

This class assignment will be worth 0 points for a sloppy or incomplete referral letter, 5 points if completed correctly and 10 points for superior work including references. It needs to be completed by the beginning of the 8th class period of the quarter.

## **GRADING SCALE:**

A Superior work	90 - 100%
B Above average work	80 - 89%
C Average work	70 - 79%
F Failure - the student must repeat the entire course	below 70%

In order to maintain satisfactory Academic Progress, a student must maintain a 2.0 or better in each and every course. Any grade less than a C must be remedied by repeating the class.

Incomplete: The student has failed to take all the required exams and/or has failed to turn in other required work

**Grades and the Grading System Final Grades** are available online through the CAMS student portal. If there are any questions on grading procedures, computation of grade point average, or the accuracy of the grade report, please contact the Registrar's Office or the Office of Academic Affairs. Grades will be reported and evaluation will be based on the Academic Policies, Procedures, & Services. Please refer to Evaluation Policy (**Policy ID: OAA.0007**)

In order to maintain **Satisfactory Academic Progress**, a student must maintain a 2.0 or better in each and every course. **Any grade less than a C must be remedied by repeating the class.** Please refer to Satisfactory Academic Progress (**Policy ID: OAA.0006**)

**Attendance:** Please refer to Attendance Policy (**Policy ID: OAA.0002**)

**Conduct and Responsibilities:** Please refer to the Personal Conduct, Responsibility and Academic Responsibility Policy (**Policy ID: OAA.0003**)

**Make-up Exams:** Please refer to Make-up Assessment Policy (**Policy ID: OAA.0001**)

**Request for Special Testing:** Please refer to Request for Special Testing (**Policy ID: OAA.0004**)

## **Accommodation for Students with Disabilities:**

If you have approved accommodations, please make an appointment to meet with your instructor as soon as possible. If you believe you require an accommodation, but do not have an approved accommodation letter, please see the Academic Counselor Lori Pino in the Office of Academic Affairs. Contact info: [Lpino@lifewest.edu](mailto:Lpino@lifewest.edu) or 510-780-4500 ext. 2061. Please refer to Service for Students with Disabilities Policy (**Policy ID: OAA.0005**)

## **Electronic Course Management:**

**Canvas** is LCCW's Learning Management System (LMS). Canvas will be used throughout the quarter during this course. Lectures, reminders, and messages will be posted. In addition, documents such as the Approved OAA/Department | January 2017

course syllabus and helpful information about the class project will be posted. Students are expected to check Canvas at least once a week in order to keep updated. The website address for Canvas is <https://lifewest.instructure.com/login/canvas> Please refer to the Educational Technologies Policy (**Policy ID: OAA.0009**)

**COURSE GOAL:** The goal of this course is to strengthen and further develop the student's understanding of neurologic examination, differential diagnosis, and clinical management. Introduce the student to the basic concepts of functional neurology. You should be able to define a neurologic pathway from initiation to termination of both ascending and descending pathways, define the fiber type and what type of effect it will have on central and peripheral function. . It will be taught from the standpoint of clinical presentation and inculcate the ability to understand underlying mechanisms for clinical observations. The course will introduce the basic concepts of functional neurology, metabolic physiology and the integration of these concepts into daily practice. Interwoven into this will be class discussion of practice conundrums, ethical considerations and professional conduct.

**COURSE OBJECTIVES:**

Weeks 1-2:-review the syllabus (policies and procedures)

- provide an overview of the course
  
- review the neurologic exam (take-home assignment)
- review normal/abnormal findings & their significance/interpretation (weakness, somatosensory alteration, DTR alteration)
  
- in-class assignments (neuroanatomy reviews, etc.)
  
- discuss the dysafferentation model of subluxation
  - discuss the potential segmental and suprasegmental effects of dysafferentation
  - discuss neuroplasticity & maladaptive neuroplastic changes
  
- initial introduction to the basic concepts of functional neurology
  - discuss the requirements for neuronal health
  - discuss the consequences of altered afferent input
    - define “diaschisis” and “transneuronal degeneration” (TND)
    - discuss the characteristics of TND
  
- review nerve fiber types Weeks

2-3: nociception & pain

- define nociception & pain
- discuss the types of pain
  - discuss nociceptive & neuropathic pain
- discuss nociceptive sensitization (facilitation, wind-up)
- discuss Complex Regional Pain Syndrome - CRPS (type1/RSD & Type 2/causalgia)
- discuss pain modulation mechanisms (segmental & suprasegmental) Weeks

3-5: radiculopathy & peripheral neuropathy

- review anatomy and function of cervical & lumbo-sacral spinal nerves & peripheral nerves of upper & lower extremities
- discuss DDX of radiculopathy & peripheral neuropathies
- discuss diagnostic criteria for radiculopathy
- discuss management of radiculopathy
  - review outcomes with chiropractic care
  - discuss management of radiculopathy
  - discuss guidelines for special studies
  - discuss guidelines for surgery
- discuss management of peripheral entrapment neuropathy
  - review sites of potential entrapment/compression
  - review outcomes with chiropractic care
  - discuss tension tests & nerve flossing Week 5
- begin introduction of functional neurology

Week 6 -Midterm Exam (1<sup>st</sup> hour)  
 -continue discussion of basic concepts of functional neurology (2<sup>nd</sup>-3<sup>rd</sup> hours)

Week 7 -discuss the cerebellum, vestibular and oculomotor systems  
 -review the innervation of extra ocular muscles  
 -discuss the actions of eye muscles (primary, secondary, tertiary)  
 -discuss dysconjugate gaze  
 -discuss convergence & exophoria on accommodation  
 -discuss pursuit & saccadic eye movements and their neural control  
 -discuss optokinetic testing  
 -discuss the vestibulo-ocular reflex (VOR)  
 -discuss using eye movements for neural rehabilitation  
 -discuss balance assessment & neural rehab for balance disorders

Week 8 -discuss neurogenic inflammation  
 -discuss metabolic toxicity  
 -discuss nutritional support Week 9

-final exam review

Week 10 Final exam

## **STUDENT LEARNING OBJECTIVES:**

1. The student will be able to describe/demonstrate the procedures of a standard neurologic examination. This will include neurologic pathways from PNS to CNS and CNS to PNS (PLO: 1,4)
2. The student will be able to discuss the normal & abnormal findings of a standard neurologic examination and discuss the significance/interpretation of the abnormal findings. (PLO: 1,4)
3. The student will be able to diagnose and differentially diagnose radiculopathies and peripheral neuropathies. (PLO: 1,4)
4. The student will be able to discuss the overall management of patients with radiculopathy, including timeframes for trial of conservative chiropractic care, rationales for ordering special studies and referral, etc. (PLO: 1,2,4,6)
5. The student will be able to discuss the dysafferentation theory of subluxation, and the potential segmental and suprasegmental consequences of altered proprioceptive afferentation. (PLO: 1,4)
6. The student will be able to discuss nociceptive transmission, the potential consequences of nociceptive afferentation, peripheral & central sensitization, the neurologic mechanisms that modulate the transmission of nociception, and how chiropractic adjustments may influence these mechanisms for pain control. (PLO:1,4)
7. The student will be able to discuss the concepts of diaschisis, neuroplasticity, and maladaptive neuroplasticity. (PLO:1,4)
8. The student will be able to discuss the basic concepts of functional neurology, including the importance of activation for neuronal survival, the characteristics of transneuronal degeneration, the development and characteristics of hemisphericity, and basic neural rehabilitation mechanisms. (PLO:1,4)
9. The student will be able to discuss the basic anatomy and function of the cerebellum, oculomotor and vestibular systems, the role and use of eye exercises in neurologic rehabilitation. (PLO: 1,4)
10. The student will be able to discuss oxidative stress/injury and appropriate nutritional support.(PLO:1,4)

**Program Learning Outcomes (PLO):** Students graduating with a Doctor of Chiropractic degree will be proficient in the following:

1. **ASSESSMENT AND DIAGNOSIS:** An assessment and diagnosis requires developed clinical reasoning skills. Clinical reasoning consists of data gathering and interpretation, hypothesis generation and testing, and critical evaluation of diagnostic strategies. It is a dynamic process that occurs before, during, and after the collection of data through history, physical examination, imaging, laboratory tests and case-related clinical services.
2. **MANAGEMENT PLAN:** Management involves the development, implementation and documentation of a patient care plan for positively impacting a patient's health and well-being, including specific therapeutic goals and prognoses. It may include case follow-up, referral, and/or collaborative care.
3. **HEALTH PROMOTION AND DISEASE PREVENTION:** Health promotion and disease prevention requires an understanding and application of epidemiological principles regarding the nature and identification of health issues in diverse populations and recognizes the impact of biological, chemical, behavioral, structural, psychosocial and environmental factors on general health.
4. **COMMUNICATION AND RECORD KEEPING:** Effective communication includes oral, written and nonverbal skills with appropriate sensitivity, clarity and control for a wide range of healthcare related activities, to include patient care, professional communication, health education, and record keeping and reporting.
5. **PROFESSIONAL ETHICS AND JURISPRUDENCE:** Professionals comply with the law and exhibit ethical behavior.
6. **INFORMATION AND TECHNOLOGY LITERACY:** Information literacy is a set of abilities, including the use of technology, to locate, evaluate and integrate research and other types of evidence to manage patient care.
7. **CHIROPRACTIC ADJUSTMENT/MANIPULATION:** Doctors of chiropractic employ the adjustment/manipulation to address joint and neurophysiologic dysfunction. The adjustment/manipulation is a precise procedure requiring the discrimination and identification of dysfunction, interpretation and application of clinical knowledge; and, the use of cognitive and psychomotor skills.
8. **INTERPROFESSIONAL EDUCATION:** Students have the knowledge, skills and values necessary to function as part of an inter-professional team to provide patient-centered collaborative care. Inter-professional teamwork may be demonstrated in didactic, clinical or simulated learning environments.
9. **BUSINESS:** Assessing personal skills and attributes, developing leadership skills, leveraging talents and strengths that provide an achievable expectation for graduate success. Adopting a systems-based approach to business operations. Networking with practitioners in associated fields with chiropractic, alternative medicine and allopathic medicine. Experiencing and acquiring the hard business skills required to open and operate an on-going business concern. Participating in practical, real time events that promote business building and quantifiable marketing research outcomes
10. **PHILOSOPHY:** Demonstrates an ability to incorporate a philosophically based Chiropractic paradigm in approach to patient care. Demonstrates an understanding of both traditional and contemporary Chiropractic philosophic concepts and principles. Demonstrates an understanding of the concepts of philosophy, science, and art in chiropractic principles and their importance to chiropractic practice.