**The McKenzie Institute USA OMPT Fellowship Program**
**FUNCTIONAL ANATOMY AND PAIN SCIENCE COURSE**

**Course Description:**

The physical therapist Fellow in Training must possess a thorough understanding of human anatomy and its relationship to both normal functional movement as well as dysfunction of the neuromusculoskeletal system in order to effectively examine, evaluate, and provide interventions for their clients in a clinical practice setting. This course will involve a detailed analysis of specific anatomic structures and their function as relates to clinical physical therapy practice. Basic mechanics, biomechanics, kinematics, kinetics and functional anatomy of the spine and extremity joints and the foundations of pain neuroscience and relationship to chronic neuromusculoskeletal conditions will be explored and examined.

**Course Objectives:** The student will be able to:

1) Identify and apply basic concepts for the analysis of normal and abnormal neuromusculoskeletal function.
2) Identify the effects of external force application on growth, development, and healing of musculoskeletal tissues.
3) Define the planes and axes of joint motions.
4) Describe selected skeletal joints in terms of: a) Structural characteristics b) classification systems c) Motions and d) Functions.
5) Analyze motions associated with specific joints in terms of structural characteristics and joint classification.
6) Describe specific muscles and their role in movement and relationship to neuromusculoskeletal dysfunction.
7) Describe and analyze the biomechanics of selected human movements in terms of the component: a) joint motions b) muscles c) force and force systems and d) ergonomics.
8) Identify and compare the type of muscle contraction that occurs during normal body movement.
9) Identify the action of selected muscles on specified joints through the resolution of forces and identification of the origins, insertions and innervations.
10) Analyze and describe the contributions of specific skeletal muscles to normal, functional movements observed in common daily activities of the upper/lower extremities and spine.
11) Compare and contrast the important osteo and arthrokinematic motions of the major joint systems.
12) Analyze the relationship between the Pain Mechanism Classification System and Mechanical Diagnosis and Therapy.
13) Analyze nociceptive and peripheral neurogenic pain mechanisms.
14) Evaluate the central sensitization, affective, and motor/autonomic pain mechanisms.

**Hours:** 30 hours including pre-course readings, post-course assignments and exam.

**Required Texts/Media:**

Assigned readings from *Joint Structure and Function* will provide the Fellow in Training a foundation for basic mechanics, biomechanics, kinematics, kinetics and functional anatomy of the spine and extremity joints. Assigned reading from *A World of Hurt* will provide the Fellow in Training foundational knowledge in pain science and classifying chronic pain for evidence based management.

1) Levangie PK, Norkin CC. *Joint Structure and Function A Comprehensive Analysis. 5th ed*. 2011. FA Davis, Philadelphia.
2) Kolski MC, O'Connor A. *A World of Hurt*. 2015.Thomas Land Publishers, St. Louis.
3) Additional current references will be provided prior to the course.

**COURSE SCHEDULE**

| Date | Joint Structure and Function | World of Hurt |
|---|---|---|
| Week 1 | Chapters 1-2 | |
| Week 2 | | Chapter 1 |
| Week 3 | 3-4 | |
| Week 4 | | 2 |
| Week 5 | 5-6 | |
| Week 6 | | 3 |
| Week 7 | 7-8 | |
| Week 8 | | 4 |
| Week 9 | 9-10 | |
| Week 10 | | 5 |
| Week 11 | 11-12 | |
| Week 12 | | 6 |
| Week 13 | 13-14 | |
| Week 14 | | 7-8 |
| Week 15 | Review | Review |