

## SYLLABUS

<b>Name of Course:</b>	RADIOLOGY II – ACS – 335/835 (lec/lab)
<b>Length of Course:</b>	3 units, 53 hours
<b>Course Description:</b>	This course is a continuation in the radiology diagnostic series; it is designed to reinforce the material of Radiology I. Normal radiographic findings are compared to abnormal radiographic findings. Trauma and arthritis are the primary conditions covered.
<b>Prerequisites:</b>	ACS - 313
<b>Course Offered by:</b>	Clinical Sciences Department
<b>Required Text:</b>	Yochum TR, Essentials of Skeletal Radiology, 3 <sup>rd</sup> ed. 2005 (Chapters 9 and 10). See Reading Assignments on page 9
<b>Recommended Text:</b>	Resnick D, Diagnosis of Bone and Joint Disorders 3 <sup>rd</sup> ed., 1995
<b>Reference Texts:</b>	None
<b>Materials:</b>	ACR Files, Radiopaedia playlists, Resnick DVDs (library)
<b>Method of Instruction:</b>	Lecture-lab with discussion and digital images/cases

**Evaluation/Grading Criteria:** The course will have one written midterm (scantron) worth 25%, one comprehensive final written (scantron) worth 35%, and two lab examinations (scantron) each worth 15%. Additionally, multiple quizzes and two homework assignments will be given throughout the quarter and will be worth 10%.

Written midterm	25%
Lab midterm	15%
Written final	35%
Lab final	15%
Quizzes (TBA)/Assignments	10 %

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<b>A</b>	<b>89.5 to 100%</b>
<b>B</b>	<b>79.5 to 89.4%</b>
<b>C</b>	<b>69.5 to 79.4%</b>
<b>F</b>	<b>69.4% and below</b>

**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 LWCC'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 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 Goals:** The goal of this course is to prepare the student to recognize and differentiate typical radiographic findings of the various traumatic injuries and arthropathies that occur in the musculoskeletal system, and to assist the student in developing an appropriate course of clinical care to include any additional imaging that may be indicated.

## **Course Objectives:**

- Week 1**      -to introduce specific terminology as it pertains to fracture/dislocation  
                  -to introduce basic principles of special imaging, MRI, CT and Bone Scan

### **Classification of Fractures**

- A. Closed
- B. Open
- C. Complete
- D. Incomplete
  - 1. Greenstick
  - 2. Torus
- E. Comminuted
- F. Noncomminuted
- G. Occult

### **Fractures of Specific Etiology**

- A. Stress Fracture/Insufficiency Fracture
- B. Pathological Fracture
- C. Compression/Impaction Fracture
- D. Avulsion Fracture
- E. Pseudofracture

### **Fracture Orientation**

- A. Oblique
- B. Spiral
- C. Transverse

### **Spatial Relationships**

- A. Angulation
- B. Apposition
- C. Distraction
- D. Rotation
- E. Stable vs. Unstable

### **Traumatic Articular Lesions**

- A. Subluxation
- B. Luxation (Dislocation)
- C. Diastasis

### **Epiphyseal Fractures – Salter-Harris Classifications**

- A. Type I
- B. Type II
- C. Type III
- D. Type IV
- E. Type V

**Week 2 -to introduce concepts of fracture healing and discuss the mechanism of injury, radiographic findings and clinical implications of cervical trauma**

**Fracture Healing**

- A. Acute Fractures
  - Healing Fractures
  - Healed Fractures
- B. Factors That Modify the Healing Process
- C. Nonunion
- D. Pseudoarticulations

**Fractures and Dislocations of the Cervical Spine**

- A. General Considerations
- B. Atlas Injuries
  - 1. Jefferson's Fracture
  - 2. Posterior Arch Fractures
  - 3. Rupture of the Transverse Ligament
- C. Axis Injuries
  - 1. Odontoid Fractures –3 Types. Beware of the Mach Bands.
    - a. Type I
    - b. Type II
    - c. Type III
  - 2. Hangman's Fracture
  - 3. Teardrop Fracture
- D. Lower Cervical Spine Injuries
  - 1. Wedge Fracture
  - 2. Burst Fracture
  - 3. Teardrop Fracture
  - 4. Articular Pillars
  - 5. Clay Shoveler's Fracture
  - 6. Whiplash Syndrome
  - 7. Facet Dislocations

**Week 3 -to discuss the mechanism of injury, radiographic findings and clinical implications of thoracic and lumbar trauma**

**Fractures and Dislocations of the Thoracic Spine**

- A. Thoracic Spine Compression Fractures

**Fractures and Dislocations of the Lumbar Spine**

- A. Compression Fractures
- B. Burst Fractures
- C. Posterior Apophyseal Ring Fractures
- D. Transverse Process Fractures
- E. Chance Fracture

**Week 4 - to discuss the mechanism of injury, radiographic findings and clinical implications of pelvic and hip trauma**

**Fractures of the Pelvis**

- A. Sacral Fractures
- B. Coccygeal Fractures
- C. Fractures of the Ilium
  - 1. Iliac Wing
  - 2. Malgaigne Fracture
  - 3. Bucket Handle Fracture
  - 4. Acetabular Fractures
  - 5. Avulsion Fractures
- D. Fractures of the Pubis and Ischium
  - 1. Straddle Fractures
  - 2. Avulsion Fractures
- E. Dislocations of the Pelvis
  - 1. Sprung Pelvis
  - 2. Pubic Diastasis

**Fractures and Dislocations of the Hip**

- A. General Considerations
- B. Types of Hip Fractures
  - 1. Intracapsular
  - 2. Extracapsular
- C. Dislocations of the Hip
  - 1. Posterior
  - 2. Complications
- D. Slipped Femoral Capital Epiphysis
  - 1. General Considerations
  - 2. Radiologic Features
  - 3. Complications

**Week 5 - to discuss the mechanism of injury, radiographic findings and clinical implications of knee, ankle, foot, rib and shoulder trauma**

**Fractures and Dislocations of the Knee**

- A. Fractures of the Knee
  - 1. Distal Femur
  - 2. Proximal Tibia
  - 3. Proximal Fibula
  - 4. Patella
- B. Dislocations of the Patella
- C. Soft Tissue Injuries

## **Fractures and Dislocations of the Ankle**

- A. Fractures of the Ankle
  - 1. Medial Malleolus
  - 2. Lateral Malleolus
  - 3. Bimalleolar Fracture

## **Fractures and Dislocations of the Foot**

- A. Calcaneal Fractures
- B. Fractures of the Talus
- C. Fractures of the Metatarsals
  - 1. Jones Fracture
  - 2. Crush Fracture
- D. Fractures of the Phalanges
  - 1. Crush Fracture
  - 2. Bedroom Fracture

## **Fractures and Dislocations of the Thorax**

- A. Thorax
  - 1. Rib Fractures
  - 2. Costal Cartilage Injuries
  - 3. Complications

## **Fractures and Dislocations of the Shoulder Girdle**

- A. General Considerations
- B. Clavicle Fractures and Complications
- C. Humeral Fractures
- D. Dislocations of the Shoulder Girdle
  - 1. Glenohumeral Joint – AI and PS
  - 2. AC Joint Separations – 3 types

**Week 6 -to discuss the mechanism of injury, radiographic findings and clinical implications of elbow, wrist and hand trauma**

## **Fractures and dislocations of the Elbow and Forearm**

- A. General Considerations
- B. Elbow Fractures
  - 1. Distal Humerus
    - a. Supracondylar Fracture
    - b. Isolated Condylar and Epicondylar Fractures
  - 2. Proximal Ulna
  - 3. Proximal Radius
    - a. Chisel Fractures
    - b. Radial Neck Fractures
  - 4. Dislocations

- C. Forearm Fractures
  - 1. Nightstick Fracture
  - 2. Monteggia Fracture
  - 3. Galeazzi's Fracture

### **Fractures and Dislocations of the Wrist**

- A. General Considerations
- B. Fractures of the Wrist
  - 1. Colle's Fracture
  - 2. Smith's Fracture
  - 3. Chauffeur's Fracture
  - 4. Ulnar Styloid Fracture
  - 5. Scaphoid Fracture
    - a. Fracture Classification
    - b. Radiologic Features
    - c. AVN
    - d. Nonunion
    - e. DJD
- C. Dislocations of the Wrist
  - 1. Lunate Dislocation
  - 2. Perilunate Dislocation
  - 3. Scapholunate Disassociation

### **Fractures and Dislocations of the Hand**

- A. General Considerations
- B. Fractures of the Hand
  - 1. Metacarpals
    - a. Boxer's Fracture
    - b. Bar Room Fracture
    - c. Bennett's Fracture
    - d. Transverse
  - 2. Volar Plate Fracture
  - 3. Gamekeeper's Thumb
- C. Dislocations

### **MIDTERM (Week 6/7)**

**Week 7/8 - to describe the clinical, pathological, and radiographic features of degenerative joint disease and other degenerative disorders**

**Degenerative Disorders**

- A. General Considerations
  - 1. Clinical Features
  - 2. Pathological Features
  - 3. Radiological Features
- B. Degenerative Joint Disease
- C. DISH
- D. OPLL
- E. Neuropathic joint disease

**Week 9 - to describe the clinical, pathological, and radiographic features of inflammatory disorders**

**Inflammatory Disorders**

- A. General Considerations
  - 1. Clinical Features
  - 2. Pathological Features
  - 3. Radiological Features
- B. Rheumatoid Arthritis
- C. Ankylosing Spondylitis
- D. Enteropathic Arthritis
- E. Psoriatic Arthritis
- F. Reiter's Syndrome
- G. Osteitis Condensans

**Week 10 - to describe the clinical, pathological, and radiographic features of metabolic disorders**

**Metabolic Disorders**

- A. General Considerations
  - 1. Clinical Features
  - 2. Pathological Features
  - 3. Radiological Features
- B. Gout
- C. CPPD
- D. HADD

**Week 11 - Final Written and Practical**



## REQUIRED READING ASSIGNMENTS

Week	Topics	Y&R Pages
1	Intro to Trauma: Fracture classification, etiology, orientation; Growth plate fractures	794-801
2/3	Fracture healing, fracture complications, cervical, thoracic, lumbar spine trauma	801-849
4	Pelvic trauma (including hips)	849-866
5	Lower extremity trauma, thorax and shoulder girdle trauma	866-898
6	Upper extremity trauma (MIDTERM WEEK 6 or 7)	898-929
7/8	(MIDTERM WEEK 6 or 7) Degenerative arthritis disorders	951-1010
9	Inflammatory arthritis disorders	1010-1078
10	Metabolic arthritis disorders	1084-1110
11	Lecture and Lab Final Exams	
*** Quizzes TBA but will include required reading content ***		

## RECOMMENDED SUMMARY TABLES:

### Named and Eponymic Fractures:

- Table: 9-22 General terms (p 935)
- Table: 9-24: Cervical Spine (p 935)
- Table 9-25: Lumbar Spine (p 936)
- Table 9-26: Pelvis (p 936)
- Table: 9-27: Knee (p 936)
- Table: 9-28: Ankle (p 936)
- Table: 9-29: Foot (p 936)
- Table: 9-30: Thorax (p 936)
- Table: 9-31: Shoulder (p 937)
- Table: 9-32: Elbow and Forearm (p 937)
- Table: 9-33: Wrist (p 937)
- Table: 9-34: Hand (p 937)

### Named signs associated with trauma:

- Table: 9-35: Trauma Name Signs (p 938)

## Student Learning Outcomes

1. The student will be able to use correct terminology to describe the radiographic signs seen with trauma and arthropathy. [PLO: 1, 3, 4, 6]
2. The student will be able to correlate mechanisms of injury to specific radiographic findings in trauma. [PLO: 1, 2, 3, 4, 8]
3. The student will be able to correlate the pathologic and radiographic findings of joint disease. [PLO: 1, 3, 4, 6]
4. The student will be able to recognize when any additional imaging modalities are indicated based on the X-ray findings of the trauma or joint related X-ray findings. [PLO: 1, 2, 3, 4, 5]
5. The student will be able to identify the clinical implications of various traumatic and arthritic conditions that affect the musculoskeletal system. [PLO: 1, 2, 3, 4, 5]

**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.