

Course Syllabus

Course Number: CLSC-5102

Course Title: Fundamentals of Diagnostic Imaging

Course Director: Christopher P Petrie, DC, DACBR

Email Address: cpetrie@parker.edu

Phone number: 972.438.6932, x7334

Twitter: @ParkerFDI

Office Hours: M-F 12-1

**Lab Instructors: Dr. Duval, Dr. Ghelarducci,
Dr. Russ, and Dr. Smoley**

Trimester Credit Hours: 2.5

Total Contact Hours: 45

Lab Hours Per Week: 1

Lab Contact Hours: 15

COURSE DESCRIPTION:

Fundamentals of Diagnostic Imaging (FDI) is an introduction to the basic principles that govern diagnostic imaging. It is designed to provide a succinct tutorial in the production of x-rays and acquisition of diagnostic quality images. The course includes discussion regarding the history and discovery of x-rays, as well as, the practical physics behind them. Additional topics include x-ray interactions with matter, x-ray film and screens, film processing, radiation protection and radiobiology. The course concludes with a look at contemporary imaging modalities such as magnetic resonance imaging (MR), computed tomography (CT) and nuclear medicine.

LEARNING OUTCOMES:

At the completion of this course, the student should be able to:

1. Explain the basic physics principles relevant to diagnostic imaging.
2. Identify the components of a radiographic imaging system.
3. Explain the processes used in producing a radiographic image including the generation of x-ray photons, their interaction with matter, the process of image acquisition and image processing.
4. Explain the factors that control the photographic and geographic properties of a radiographic image.
5. Explain the basic principles of radiobiology and radiation safety.
6. Explain the basic physics principles behind advanced imaging techniques, including MR, CT and nuclear imaging modalities.
7. Describe characteristics of images produced from various modalities using appropriate terminology.
8. Assess the technical quality of x-ray radiographic series.
9. Analyze clinical indications and external factors to determine the appropriate use of imaging modalities in the clinical setting.
10. Understand the role of diagnostic imaging in the practice of chiropractic.

TEACHING PHILOSOPHY

I teach in order to learn. Teaching affords me the opportunity to learn and grow personally and professionally while inspiring others to do the same. Through teaching I gain greater mastery of my subject, greater effectiveness in my communication, greater insight into the learning process (both of others and myself), greater appreciation of the wisdom of others, and greater respect for the capabilities of the inspired human spirit. I approach my role as teacher as that of a mentor or guide, someone there to offer direction, clarification, context, feedback, advice and inspiration. When I can, I use classroom strategies that take the focus off me and put the focus instead on a guided discovery process for students. I firmly believe that learning, real learning, not just remembering, comes from the integration and application of information, not memorization and regurgitation. It is the process of weaving the different data points together that results in understanding and growth. That is why learning is a process and not an endpoint. As a process, it requires the learner to be actively engaged and the teacher to be engaging, either in the delivery of the lecture or in the activities that supplant it.

GENERAL APPROACH TO TEACHING:

FDI is designed to be interactive. Short webinars for each topic are available from the course webpage to complement recommended readings and topic research. Class lectures will expound on the webinar topics and include discussion and interactive exercises. Students are expected to prepare in advance for the day's topic by reading the suggested section from the required text in addition to watching the pertinent webinars. Students may use other sources for class preparation and studying such as other texts, Wikipedia and other online sources; however, the required text will be the reference for all assessments.

ESTIMATE OF STUDENT WORK LOAD:

As graduate-level students, my academic expectations are high. Success in this course is multi-factorial. The following list represents a suggested strategy for successful course completion.

1. Be familiar with this syllabus and the course calendars.
2. Consult the course calendars regularly to ensure you stay abreast of the current topics of discussion.
3. Review the rubrics for course assessments and projects in advance and be familiar with the criteria for success on those assessments.
4. Be prepared for class by watching the webinars and reading the textbook passages pertinent to the topics to be discussed in lecture ahead of time.
5. Be on-time to class in order to complete the daily class starter exercises.
6. You should anticipate spending, at a minimum, 1 hour outside of class for each lecture or lab hour working with the information discussed in this course. This should include review of notes, reading the required textbooks or discussing topics with your peers (group study).

7. Each lecture hour is recorded and can be downloaded from the link on the Fundamentals of Diagnostic Imaging course page of MyParker or through iTunes University. These should be reviewed as needed.
8. Utilize the Parker Radiology Website. There is link on the Fundamentals of Diagnostic Imaging course page of MyParker.
9. Participate in lecture and lab sessions.
10. At the conclusion of each week, take some time to reflect on what we have discussed in class and complete the weekly reflection assignment.
11. Come see me if you need any help. You may also inquire about a tutor in the Student Affairs office.

ASSESSMENT

- Radiographic Principles Assessment (RPA): Friday, March 1st, 7:00 AM 13%

The Radiographic Principles Assessment will consist of a series of questions and scenarios assessing the students understanding of radiographic concepts and assessment skills discussed and practiced in the course and the ability to apply those ideas and skills in various clinically-relevant scenarios. It may, at the instructor's discretion, be composed of a combination of multiple-choice, matching, true/false, fill-in-blank, and short-answer questions covering concepts and skills from both lecture and lab. Some questions will pertain to images projected in the classroom on a repeating rotation throughout the assessment period. Students will have 60 minutes to complete the assessment.

- RPA Follow-up Project: Due date to be determined 10%

Following the RPA, students will be provided with a report that breaks down their assessment score in a variety of ways, for example, by topic. The report identifies areas of strength and weakness on the exam. Students are required to complete an RPA follow-up project based on the results provided in the report. The project consists of three parts: reflection, plan and product. The first two parts are due together. The reflection part consists of a substantive reflection on the assessment performance, what areas were found to be strong, what areas were found to be weak, and what factors contributed to the strengths and weaknesses identified on the report. The plan part lays out a plan for improving knowledge and understanding in the areas identified as weak on the assessment. The plan will also describe a product to be submitted at a later date to be determined that serves as evidence that the plan has been executed.

- Closing Thought Exercise: Friday, April 12th, 7:00 AM 20%

The closing thought exercise is intended to assess the overall growth of students' skills and thought processes regarding diagnostic imaging and its use in clinical practice. It may, at the instructor's discretion, be composed of a combination of multiple-choice, matching, true/false, fill-in-blank, and short-answer questions. The exercise will draw on ideas and skills from throughout the course, but will focus primarily on the clinical application of the concepts and skills discussed. The exercise will consist of a series of questions and

scenarios to be completed in 90 minutes. Some questions will pertain to images projected in the classroom on a repeating rotation throughout the assessment period.

▪ Case Scenario and Narrative Project: 20%

This project will provide an overarching theme for the course. Students will work in teams to work-up a patient presenting to their clinic. After taking a history, the team will generate a differential diagnosis list and identify its working diagnosis. Imaging studies will be performed, and the team will assess the imaging studies for technical quality. With instructor guidance, the team will also identify pathological findings on the studies and relate them to the patient's clinical presentation. Following the imaging studies and any other ancillary test results provided, the team will identify the final diagnosis of the patient. The team will prepare a general treatment protocol for the patient's care and provide a prognosis for the patient's recovery. The project will conclude with the completion of a narrative report of the case scenario followed by self- and peer assessments of the narrative report. This project will occur in phases over several weeks. Time will be provided in class to work on this project, although additional time may be required outside of class. More details will be provided in class.

▪ Imaging of Pathology Presentations: 12%

Following our discussion on the various imaging modalities available in clinical practice, students will break into small groups and receive an assigned a pathology to research and prepare a 4-6 minute presentation for the class. The presentation will relate the fundamental pathophysiology, typical clinical presentation, and imaging approach for the assigned pathology. More details will be provided in class.

▪ Class starters and in-class activities: 15%

Class will usually begin with a question or series of questions. The purpose of the questions is to get you thinking about the topic to be discussed or a related topic. Some questions may relate to topics covered in the pre-lecture webinars. Others may ask you to offer an opinion about a topic or to speculate about a relationship between lecture topics. Responses to the questions are scored based on completion and effort rather than on correctness alone. On occasion, a quiz may be substituted for the class starter question(s). Quizzes will be multiple-choice in format and consist of approximately five questions. No make-ups are permitted for missed class starters or quizzes, to include the student arriving late to class. Exceptions will not be made for any reason. Class starters and quizzes will be submitted on 3"x5" notecards provided by the student. Various in-class activities may also be used to reinforce concepts presented in class. In-class activities cannot be made-up for any reason, no exceptions.

- Reflection assignments: 10%

Each week you are required to take time to reflect on what you have learned in the course that week and consider how the topics, ideas and skills from class relate to your previous experience, relate to other courses you are taking, and how they might play a role in your future practice. Reflection assignments are graded on a complete/incomplete basis; however, the reflections must be substantive in order to receive credit. Substantive reflections generally require several sentences at a minimum. While reflections are not graded for grammar and spelling, use of proper grammar and spelling is appreciated. Now is as good a time as any to begin practicing your professional communication skills. More information about the reflection assignments will be discussed in class.

PREREQUISITES:

Enrollment at Parker University, College of Chiropractic

REQUIRED TEXTBOOKS:

Radiographic Imaging & Exposure, 3rd edition, Fauber

RECOMMENDED ADDITIONAL TEXTBOOKS:

Clinical Imaging, 2nd edition, Marchiori

Essentials of Skeletal Radiology, 3rd edition, Yochum and Rowe

Radiologic Sciences for Technologist: Physics, Biology and Protection, 9th edition,
Bushong

SUPPLIES:

One package (100 ct.) of 3x5 notecards

GRADING SYSTEM:

Evaluation is an integral part of the educational process and is used as an educational tool to help students identify problem areas, to recognize and reward achievement, and to identify students who are unable to meet the rigors of the curriculum. Final course grades and their interpretation are listed below:

Grade	Numerical Value	Grade Point Average	Interpretation of Academic Achievement
A	89.5 – 100	4.0	Excellent
B	79.5 - 89.49	3.0	Above Average
C	69.5 - 79.49	2.0	Satisfactory
F	69.49 or Below	0.0	Unacceptable

This grading scale is strictly adhered to. There are NO exceptions.

LABS:

No additional supplies are required for lab. Students will be taking and developing x-ray films in the lab. If a student has a concern about radiation exposure or chemical exposure during the lab experiments, they should be brought to the course director's attention at the beginning of the course. Where possible, accommodations will be made for those students.

OPEN LABS:

Open labs are held each week beginning in week 4 according to the schedule published on MyParker. The labs are monitored by student workers who are not expected or obligated to offer tutoring to students. Students are encouraged to discuss questions about course content with either the course director or their lab instructor. The course director is not responsible for incorrect information relayed by student workers in the open labs.

90/90 RULE:

The 90/90 rule is not applicable for this class.

EXTRA CREDIT:

Opportunities to earn additional points may be included on the various grading instruments used in the course. The instructor reserves the right to offer additional opportunities at his discretion.

COMPLETE LISTING OF ALL ACADEMIC POLICIES:

A complete listing of all Academic policies is found on the MyParker Website→Academic Home Page→Common Policies:

https://my.parker.edu/ICS/Academics_-_Coursework/Academics/College_Catalog

Absences for Religious Holidays
Academic Dishonesty
Academic Promotion, Probation and Dismissal Policy
Appeals
Assistance and Accommodations
Attendance Policy
Audio/Video Taping
Cell Phones and Electronic Devices in Class
Classroom Behavior
Communications
Computer Usage
Examinations (Make up Exams/Lab Practicals)
Altering Grades on Exams
Exam Review
Final Examinations

Grading System
Grade Appeals Process
Late Instructors to Lecture/Lab
Missed Exam Policy
Professional Decorum
Special Needs Consideration
Student Bereavement Policy
Excused Absences

DISCLAIMER:

The lecture outlines contained in the lecture booklet are NOT intended to represent the entire content of the course. A lecture outline is intended to be a guide to the lecture. The responsibility of the instructor is to follow the outline, expand the concepts and give explanation and illustrations to clarify content. The role of the student is to attend lecture and take notes over material presented by the lecturer that explains and illustrates the material listed in the outline. It is also the responsibility of the student to question the instructor if explanations and illustrations are not clearly presented or understood.

The instructors take no responsibility for the accuracy or completeness of old notes, quiz questions or exam questions that students may purchase, acquire from off of the internet or be given by previous students.

IMPORTANT NOTE:

The provisions contained in this syllabus do not constitute a binding contract between the student and the Parker University, College of Chiropractic. These provisions may be changed at any time and for any reason at the discretion of the Course Director. When it is necessary to make changes to this document, appropriate notice (at least one week, if at all possible) will be given to the student(s).