



The course aims to provide a comprehensive understanding of advanced imaging modalities and their applications in various clinical scenarios. Students will delve into the theoretical and practical aspects of utilizing different modalities for diagnostic imaging. This includes exploring the principles, techniques, and interpretation of studies such as X-rays, CT scans, MRI, ultrasound, and nuclear medicine imaging.

Additionally, the course will cover important topics related to radiotherapy, medical genetics, digital pathology, and the emerging field of artificial intelligence. Students will learn how these areas intersect with and enhance the practice of diagnostic imaging.

Furthermore, the course will introduce students to the fundamentals of electronic and informatics bioengineering, enabling them to grasp the basic principles underlying different imaging modalities. They will also be exposed to various image processing methods used to extract meaningful information from biomedical images.

Overall, this course aims to equip medical students with a solid foundation in the theoretical and practical aspects of advanced imaging modalities, empowering them to effectively utilize these techniques in clinical practice for accurate diagnosis and patient care.

Anatomy and Physiology.

Mathematics and Statistics.

Biomedical Electronics and instrumentation.

Radiology

Introduction to Advanced Diagnostic Imaging: clinical domains of different imaging modalities. (1h)

Contrast Media: how to increase contrast in Radiology; rationale and utilization of contrast media in various imaging modalities. Overview of relative and absolute contraindications. (1h)



Fundamentals of chest X-Ray semeiotics (atelectasis, pleural effusion, pneumonia, pneumothorax, Pneumomediastinum, pneumopericardium and subcutaneous emphysema). (1h)

Imaging and management of pulmonary nodules. (1h)

Cardiovascular Diseases Unveiled: Decoding Pathological Presentations through Advanced Imaging Techniques (2h)

Gastrointestinal Radiology of Upper GI tract: awareness of clinical role and specific indications of major imaging modalities; differential diagnoses of main pathological conditions and rational to use different diagnostic techniques. (2h)

Gastrointestinal Radiology of Lower GI tract: awareness of clinical role and specific indications of major imaging modalities; differential diagnoses of main pathological conditions and rational to use different diagnostic techniques. (2h)

Multimodality evaluation of Focal Liver Lesions. (2h)

Pancreatic Imaging: Unlocking Insights through Radiological Exploration. (2h)

Nephrology and Urology: recognition of main pathological affections involving urinary tract, testicle and prostate disease; learning use, advantages and disadvantages of different imaging modalities. (2h)

Female Imaging Part 1: Breast. (2h)

Female Imaging Part 2: Gynecological radiology. (2h)

Fundamentals of brain imaging: ischemic stroke and hemorrhages (2h)

Fundamentals of brain imaging: intracranial masses (2h)

Choosing wisely: how to prescribe the correct imaging examination (2h)

Interventional Radiology and Image guided therapy: significance and clinical utilization of main interventional procedures performed by radiologists. (2h)

Principle of AI in advanced diagnostic imaging. (2h)

NUCLEAR MEDICINE

- Fundamentals of Nuclear Medicine Techniques (2h)



- Numeric approach to tomographic reconstruction: Radon transform, Sinogram, back-

