UANL
UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN

FACULTAD DE MEDICINA

MODULE DESCRIPTION (ANALYTICAL PROGRAM).

1. Module Information Code:	
• Name of the Institution and School	Universidad Autónoma de Nuevo León, School of Medicine
• Name of the Learning Unit	Medical Imaging
• Total classroom hours for theory and/or practice.	69 hours
• Total extra classroom hours	51 hours
• Course Modality	Schooled
• Type of academic period in which the module is offered	5th semester
• Type of Learning Unit in the Curriculum	Compulsory
• Curriculum area:	ACFP-F Essential Professional
• UANL credit points	4
• Date of module creation:	February 4, 2016
• Date of last amendment:	November 10, 2020
• Person(s) responsible for the module design and amendments:	Dr. C. Guillermo Elizondo Riojas

2. Introduction

The learning unit ***Medical Imaging*** is part of the essential professional curricular education. The student develops the capability to identify each region's normal anatomy with different imaging studies and tests as well as the description of the most common radiological signs and their connection with the most frequent pathologies. Likewise, the student must be able to select the most adequate imaging study according to the clinical situation which needs to be faced during his general medical practice. The module is structured in eight stages and it analyzes anatomy, signs, and pathologies from different body regions as well as the applications of Interventional Radiology.

3. Purpose(s)

In this learning unit, the student will be able to analyze different medical imaging methods, explain its indications and interpret the radiological reports; recognize the anatomical structures, apply the main radiological signs, and analyze the main pathologies with different imaging methods;

all this is done as part of the context held by the learning units at Internal Medicine, General Surgery, and different surgical branches, as well as Pediatrics, Gynecology, and Obstetrics, in order to solve problems from the primary health care level in the population.

The teaching-learning structure is applied through the implementation of a methodology which favors autonomous learning with aims of collaboration and mainly focused in problem solving. Likewise, the module develops in the student the competences corresponding to areas such as critical thinking and research, ethical and professional values, organizational work, personal and professional development and communication skills.

4. Competences of the graduate profile

a. General competences contributing to this learning unit.

Instrumental skills:

1. Apply autonomous learning strategies in the different levels and fields of knowledge that allow them make appropriate and relevant decisions in the personal, academic and professional fields.

3. Use the information and communication technologies as access tools to information and its transformation in knowledge, as well as for learning and collaborative work with cutting-edge techniques that allow its constructive participation in society.

6. Use a second language, English in particular, with clarity and correctness to communicate in common, academic, professional and scientific contexts.

Personal and social interaction skills

10. Intervene in front of the challenges of contemporary society at the local and global level with a critical attitude and human, academic and professional commitment to help consolidate the general wellness and sustainable development.

11. Practice the values promoted by the UANL: truth, equality, honesty, liberty, solidarity, respect for life and anyone's, peace, respect for nature, integrity, ethics behavior and justice, within their personal and professional environment in order to make a sustainable society.

Integrative skills

12. Make innovative proposals based on the holistic understanding of reality to help overcome the challenges of the interdependent global environment.

15. Achieve the adaptability required in uncertain professional and social environments of our time to improve living conditions.

b. Specific competences of the graduate profile that contributes to the learning unit

1.- Use the medicine scientific fundaments considering economical, psychological, social, cultural and environmental factors which contribute to the development and evolution of a disease for decision-making and medical actions.

2.- Solves clinical problems through deductive reasoning, interpretation of findings and definition of their nature with the aim of making decisions and determine action principles of the medical practice to follow in a responsible way, impacting individual and collective health.

4.- Manage properly patients with the most frequent diseases from a biopsychosocial perspective, through the application of knowledge, technical procedures and basic diagnostic, based on clinical guides and attention protocols in order to solve the main health problems from the Primary Health Care level from individuals and the community.

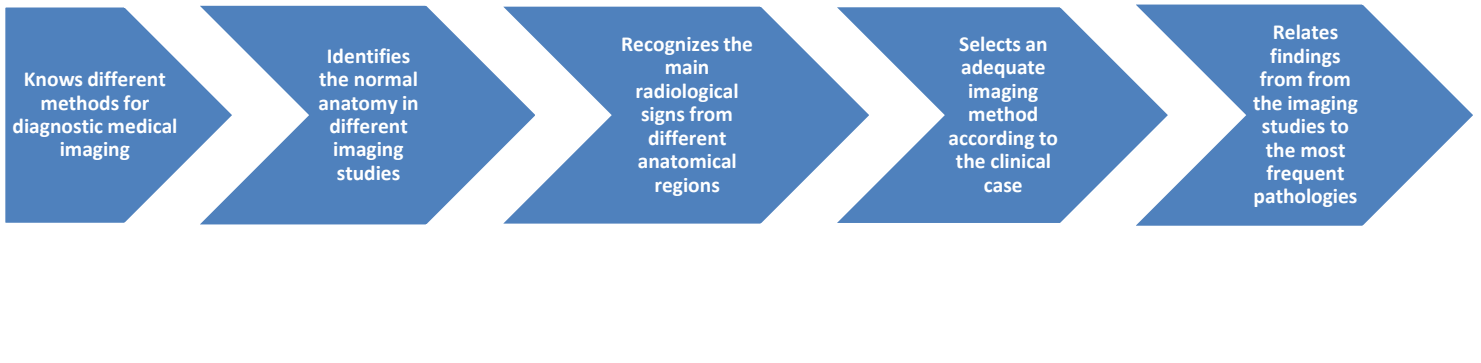
6.- Manage human resources, diagnostic interventions, therapeutic modalities, and options on health care according to national standards, promoting a quality culture in attention and guaranteeing patients' security.

7.- Applies the scientific method for the resolution of medical problems with an innovative, analytic and self-critical attitude for preventing, diagnosing and treating diseases.

9.- Respects the patient's integrity keeping the patient's medical information as an essential part of their professional secret in order to preserve his rights.

10.- Promotes an organizational work culture for the health field, acknowledging the multidisciplinary work, respect for institutional policies and the observance of rules in order to contribute to a comprehensive treatment of patients.

5. Course roadmap:



6. Structuring into stages or phases

Phase 1: Thorax Imaging

Component(s) of the competence:

Recognize in the different thorax imaging studies the normal anatomy and the main radiological signs to get to an accurate diagnostic of the most frequent pathologies.

Evidence of student learning	Performance Criteria	Learning activities	Contents	Resources
Resolution of clinical cases from Thorax in both oral and written form.	• Describes the studies and their special technical characteristics • Identifies the anatomical structures • Interprets the radiological findings • Analyzes the different types of differential dianostics. • Explains the clinical importance of the findings	Evaluation for the individual revision made for the topic with quick response short assessments (Turning point tests) before starting lectures or class. Exposition of the topic given by the professor of the group. Questions and answer activity where the professor and the Undergraduate Instructors assigned to each group solve questions from the students. On-line clinical case resolution through the platform Med-U (www.med-u.org) previously assigned according to the topics list	**Conceptual Content** Anatomy and imaging methods. Main radiological signs. Pathology Instructions for the patient to have an imaging study. **Procedural Content** Interpret images Recognize normality and abnormality through the imaging methods. Make a request for an adequate imaging study according to the clinical case presented.	• SECI Classroom: Table SECTRA • Med-U Platform • Turning Point Exams for fast answers • ExamSoft Platform • Electronic sites. • Text book • Reference books

	• Values the studies which will complement the definitive diagnostic. • Prepares the topic with the team • Discusses the topics with the instructors. • Integrates arguments which complement the topic assigned to the team. • Concludes the topic with the most important arguments which have a solid or perfect basis.	Oral exposition about the clinical cases seen at Platform Med-U before the undergraduate instructors fro them to evaluate with rubrics from the platform Exam Soft (www.examsoft.com/uanldri). Solve doubts with the undergraduate instructors.	**Attitudinal Content** Confidentiality on the management of patient's information Medical professionalism. Attachment to procedures.	

Phase 2: Abdomen Imaging

Component(s) of the competence:
Recognize in the different abdomen imaging studies the normal anatomy and the main radiological signs to get to an accurate diagnostic of the most frequent pathologies.

Evidence of student learning	Performance Criteria	Learning activities	Contents	Resources
Resolution of clinical cases from Abdomen in both oral and written form.	• Describes the studies and their special technical characteristics • Identifies the anatomical structures • Interprets the radiological findings • Analyzes the different types of differential dianostics. • Explains the clinical importance of the findings	• Evaluation for the individual revision made for the topic with quick response short assessments (Turning point tests) before starting lectures or class. • Exposition of the topic given by the professor of the group. • Questions and answer activity where the professor and the Undergraduate Instructors assigned to each group solve questions from the students.	**Conceptual Content** • Anatomy and imaging methods. • Main radiological signs. • Pathology • Instructions for the patient to have an imaging study. **Procedural Content** • Interpret images • Recognize normality and abnormality through the imaging methods.	• SECI Classroom: Table SECTRA • Med-U Platform • Turning Point Exams for fast answers • ExamSoft Platform • Electronic sites. • Text book • Reference books

	• Values the studies which will complement the definitive diagnostic. • Prepares the topic with the team • Discusses the topics with the instructors. • Integrates arguments which complement the topic assigned to the team. • Concludes the topic with the most important arguments which have a solid or perfect basis.	• On-line clinical case resolution through the platform Med-U (www.med-u.org) previously assigned according to the topics list • Oral exposition about the clinical cases seen at Platform Med-U before the undergraduate instructors fro them to evaluate with rubrics from the platform Exam Soft (www.examsoft.com/uanldri). • Solve doubts with the undergraduate instructors	• Make a request for an adequate imaging study according to the clinical case presented. **Attitudinal Content** • Confidentiality on the management of patient's information • Medical professionalism. • Attachment to the regulatory framework.	

Phase 3: Gynecology, Obstetrics, and Mammary Gland Imaging

Component(s) of the competence:
Recognize in the different gynecologycal and mammary gland imaging studies the normal anatomy and the main radiological signs to get to an accurate diagnostic of the most frequent pathologies.

Evidence of student learning	Performance Criteria	Learning activities	Contents	Resources
Resolution of clinical cases from gynecology, obstetrics, and mammary gland in both oral and written form.	• Describes the studies and their special technical characteristics • Identifies the anatomical structures • Interprets the radiological findings • Analyzes the different types of differential dianostics. • Explains the clinical importance of the findings	• Evaluation for the individual revision made for the topic with quick response short assessments (Turning point tests) before starting lectures or class. • Exposition of the topic given by the professor of the group. • Questions and answer activity where the professor and the Undergraduate Instructors assigned to each group solve questions from the students.	**Conceptual Content** • Anatomy and imaging methods. • Main radiological signs. • Pathology • Instructions for the patient to have an imaging study. **Procedural Content** • Interpret images • Recognize normality and abnormality through the imaging methods.	• SECI Classroom: Table SECTRA • Med-U Platform • Turning Point Exams for fast answers • ExamSoft Platform • Electronic sites. • Text book • Reference books

	• Values the studies which will complement the definitive diagnostic. • Prepares the topic with the team • Discusses the topics with the instructors. • Integrates arguments which complement the topic assigned to the team. • Concludes the topic with the most important arguments which have a solid or perfect basis.	• On-line clinical case resolution through the platform Med-U (www.med-u.org) previously assigned according to the topics list • Oral exposition about the clinical cases seen at Platform Med-U before the undergraduate instructors fro them to evaluate with rubrics from the platform Exam Soft (www.examsoft.com/uanldri). • Solve doubts with the undergraduate instructors	• Make a request for an adequate imaging study according to the clinical case presented. **Attitudinal Content** • Confidentiality on the management of patient's information • Medical professionalism. • Attachment to the regulatory framework.	

Phase 4: Head and neck imaging

Component(s) of the competence:
Recognize in the different head and neck imaging studies the normal anatomy and the main radiological signs to get to an accurate diagnostic of the most frequent pathologies.

Evidence of student learning	Performance Criteria	Learning activities	Contents	Resources
Resolution of clinical cases from head and neck in both oral and written form.	• Describes the studies and their special technical characteristics • Identifies the anatomical structures • Interprets the radiological findings • Analyzes the different types of differential dianostics. • Explains the clinical importance of the findings	• Evaluation for the individual revision made for the topic with quick response short assessments (Turning point tests) before starting lectures or class. • Exposition of the topic given by the professor of the group. • Questions and answer activity where the professor and the Undergraduate Instructors assigned to each group solve questions from the students.	**Conceptual Content** • Anatomy and imaging methods. • Main radiological signs. • Pathology • Instructions for the patient to have an imaging study. **Procedural Content** • Interpret images • Recognize normality and abnormality through the imaging methods.	• SECI Classroom: Table SECTRA • Med-U Platform • Turning Point Exams for fast answers • ExamSoft Platform • Electronic sites. • Text book • Reference books

	• Values the studies which will complement the definitive diagnostic. • Prepares the topic with the team • Discusses the topics with the instructors. • Integrates arguments which complement the topic assigned to the team. • Concludes the topic with the most important arguments which have a solid or perfect basis.	• On-line clinical case resolution through the platform Med-U (www.med-u.org) previously assigned according to the topics list • Oral exposition about the clinical cases seen at Platform Med-U before the undergraduate instructors fro them to evaluate with rubrics from the platform Exam Soft (www.examsoft.com/uanldri). • Solve doubts with the undergraduate instructors	• Make a request for an adequate imaging study according to the clinical case presented. **Attitudinal Content** • Confidentiality on the management of patient's information • Medical professionalism. • Attachment to the regulatory framework.	

Phase 5: Neuroradiology

Component(s) of the competence:
Recognize in the different neuroradiology imaging studies the normal anatomy and the main radiological signs to get to an accurate diagnostic of the most frequent pathologies.

Evidence of student learning	Performance Criteria	Learning activities	Contents	Resources
Resolution of clinical cases related to neuroradiology in both oral and written form.	• Describes the studies and their special technical characteristics • Identifies the anatomical structures • Interprets the radiological findings • Analyzes the different types of differential dianostics. • Explains the clinical importance of the findings	• Evaluation for the individual revision made for the topic with quick response short assessments (Turning point tests) before starting lectures or class. • Exposition of the topic given by the professor of the group. • Questions and answer activity where the professor and the Undergraduate Instructors assigned to each group solve questions from the students.	**Conceptual Content** • Anatomy and imaging methods. • Main radiological signs. • Pathology • Instructions for the patient to have an imaging study. **Procedural Content** • Interpret images • Recognize normality and abnormality through the imaging methods.	• SECI Classroom: Table SECTRA • Med-U Platform • Turning Point Exams for fast answers • ExamSoft Platform • Electronic sites. • Text book • Reference books

	• Values the studies which will complement the definitive diagnostic. • Prepares the topic with the team • Discusses the topics with the instructors. • Integrates arguments which complement the topic assigned to the team. • Concludes the topic with the most important arguments which have a solid or perfect basis.	• On-line clinical case resolution through the platform Med-U (www.med-u.org) previously assigned according to the topics list • Oral exposition about the clinical cases seen at Platform Med-U before the undergraduate instructors fro them to evaluate with rubrics from the platform Exam Soft (www.examsoft.com/uanldri). • Solve doubts with the undergraduate instructors	• Make a request for an adequate imaging study according to the clinical case presented. **Attitudinal Content** • Confidentiality on the management of patient's information • Medical professionalism. • Attachment to the regulatory framework.	

Phase 6: Muscle Skeletal system imaging

Component(s) of the competence:
Recognize in the different muscle skeletal imaging studies the normal anatomy and the main radiological signs to get to an accurate diagnostic of the most frequent pathologies.

Evidence of student learning	Performance Criteria	Learning activities	Contents	Resources
Resolution of clinical cases from the muscle skeletal system in both oral and written form.	• Describes the studies and their special technical characteristics • Identifies the anatomical structures • Interprets the radiological findings • Analyzes the different types of differential dianostics. • Explains the clinical importance of the findings	• Evaluation for the individual revision made for the topic with quick response short assessments (Turning point tests) before starting lectures or class. • Exposition of the topic given by the professor of the group. • Questions and answer activity where the professor and the Undergraduate Instructors assigned to each group solve questions from the students.	**Conceptual Content** • Anatomy and imaging methods. • Main radiological signs. • Pathology • Instructions for the patient to have an imaging study. **Procedural Content** • Interpret images • Recognize normality and abnormality through the imaging methods.	• SECI Classroom: Table SECTRA • Med-U Platform • Turning Point Exams for fast answers • ExamSoft Platform • Electronic sites. • Text book • Reference books

	• Values the studies which will complement the definitive diagnostic. • Prepares the topic with the team • Discusses the topics with the instructors. • Integrates arguments which complement the topic assigned to the team. • Concludes the topic with the most important arguments which have a solid or perfect basis.	• On-line clinical case resolution through the platform Med-U (www.med-u.org) previously assigned according to the topics list • Oral exposition about the clinical cases seen at Platform Med-U before the undergraduate instructors fro them to evaluate with rubrics from the platform Exam Soft (www.examsoft.com/uanldri). • Solve doubts with the undergraduate instructors	• Make a request for an adequate imaging study according to the clinical case presented. **Attitudinal Content** • Confidentiality on the management of patient's information • Medical professionalism. • Attachment to the regulatory framework.	

Phase 7: Pediatrics Imaging

Component(s) of the competence:
Recognize in the different Pediatrics imaging studies the normal anatomy and the main radiological signs to get to an accurate diagnostic of the most frequent pathologies.

Evidence of student learning	Performance Criteria	Learning activities	Contents	Resources
Resolution of clinical cases from Pediatrics in both oral and written form.	• Describes the studies and their special technical characteristics • Identifies the anatomical structures • Interprets the radiological findings • Analyzes the different types of differential dianostics. • Explains the clinical importance of the findings	• Evaluation for the individual revision made for the topic with quick response short assessments (Turning point tests) before starting lectures or class. • Exposition of the topic given by the professor of the group. • Questions and answer activity where the professor and the Undergraduate Instructors assigned to each group solve questions from the students.	**Conceptual Content** • Anatomy and imaging methods. • Main radiological signs. • Pathology • Instructions for the patient to have an imaging study. **Procedural Content** • Interpret images • Recognize normality and abnormality through the imaging methods.	• SECI Classroom: Table SECTRA • Med-U Platform • Turning Point Exams for fast answers • ExamSoft Platform • Electronic sites. • Text book • Reference books

	• Values the studies which will complement the definitive diagnostic. • Prepares the topic with the team • Discusses the topics with the instructors. • Integrates arguments which complement the topic assigned to the team. • Concludes the topic with the most important arguments which have a solid or perfect basis.	• On-line clinical case resolution through the platform Med-U (www.med-u.org) previously assigned according to the topics list • Oral exposition about the clinical cases seen at Platform Med-U before the undergraduate instructors fro them to evaluate with rubrics from the platform Exam Soft (www.examsoft.com/uanldri). • Solve doubts with the undergraduate instructors	• Make a request for an adequate imaging study according to the clinical case presented. **Attitudinal Content** • Confidentiality on the management of patient's information • Medical professionalism. • Attachment to the regulatory framework.	

Phase 8: Interventionist Radiology

Component(s) of the competence:
Recognize in the different vascular and interventionist imaging studies the normal anatomy and the main radiological signs to get to an accurate diagnostic of the most frequent pathologies.
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Evidence of student learning	Performance Criteria	Learning activities	Contents	Resources
Resolution of clinical cases from Interventionist Radiology in both oral and written form.	• Describes the studies and their special technical characteristics • Identifies the anatomical structures • Interprets the radiological findings • Analyzes the different types of differential dianostics. • Explains the clinical importance of the findings	• Evaluation for the individual revision made for the topic with quick response short assessments (Turning point tests) before starting lectures or class. • Exposition of the topic given by the professor of the group. • Questions and answer activity where the professor and the Undergraduate Instructors assigned to each group solve questions from the students.	**Conceptual Content** • Anatomy and imaging methods. • Main radiological signs. • Pathology • Instructions for the patient to have an imaging study. **Procedural Content** • Interpret images • Recognize normality and abnormality through the imaging methods.	• SECI Classroom: Table SECTRA • Med-U Platform • Turning Point Exams for fast answers • ExamSoft Platform • Electronic sites. • Text book • Reference books

	• Values the studies which will complement the definitive diagnostic. • Prepares the topic with the team • Discusses the topics with the instructors. • Integrates arguments which complement the topic assigned to the team. • Concludes the topic with the most important arguments which have a solid or perfect basis.	• On-line clinical case resolution through the platform Med-U (www.med-u.org) previously assigned according to the topics list • Oral exposition about the clinical cases seen at Platform Med-U before the undergraduate instructors fro them to evaluate with rubrics from the platform Exam Soft (www.examsoft.com/uanldri). • Solve doubts with the undergraduate instructors	• Make a request for an adequate imaging study according to the clinical case presented. **Attitudinal Content** • Confidentiality on the management of patient's information • Medical professionalism. • Attachment to the regulatory framework.	

7. Summative Evaluation

Resolution of thorax clinical cases ……...2%
Resolution of abdomen clinical cases ……..….2.6%
Resolution of Gynecology, Obstetrics and Mammary Gland clinical cases ……..….0.7%
Resolution of head and neck clinical cases ……..…0.7%
Resolution of Neuroradiology clinical cases.……..……..1.3%
Resolution of Muscle Skeletal system clinical cases ……..1.3%
Resolution of Pediatrics Radiology clinical cases ……..……..0.7%
Resolution of Interventionist Radiology clinical cases ……..……0.7%
First partial exam …..……...25%
Second partial exam …..……..25%
Final exam ..……...25%
CIP- Resolution of Medical Imaging clinical cases in both oral and written form ……15%
TOTAL……100%

8. Course Integrative Product.

Resolution of Medical Imaging clinical cases in both oral and written form

9. References:

Del Cura, J. L., Pedraza, S. & Gayete, A. (2010). *Radiología esencial*. México, D.F.: Editorial Panamericana.

Erkonen, W. E. & Smith, W. L. (2010). *Radiología 101: Las bases y fundamentos de los estudios de imagen*. Philadelphia, PA: Lippincott Williams & Wilkins.

Herring, W. (2013). *Radiología Básica*. España: Elsevier Saunders.

Additional references:

Brant, W.E. & Helms, C.A. (2007). *Fundamentals of Diagnostic Radiology.* Philadelphia, PA: Lippincott Williams & Wilkins

Collins, J. & Stern, E.J. (2008). *Chest Radiology: The Essentials*. Philadelphia, PA: Lippincott Williams & Wilkins

Dähnert, W. (2011). *Radiology Review Manual.* Philadelphia, PA: Lippincott Williams & Wilkins.

Goodman, L. (2007). *Felson´s Principles of Chest Roentgenology*. Philadelphia, PA: Elsevier Saunders.

Herring, W. (2012). *Learning Radiology: Recognizing the Basics.* Philadelphia, PA: Elsevier.

Digital references

www.idhu.mx

www.med-u.org

www.learningradiology.com

http://radiologymasterclass.co.uk/gallery/galleries.html

http://radiopaedia.org/

http://www.dartmouth.edu/~anatomy/HAE/Radiology_Intro/rad_index.html

APPENDIX.

ASSESSMENT AND WORKLOAD

Module workload		Number of hours	Percentage
Contact hours	Class-based instruction	32h (46.3%)	57.5%= 69 hours
	Resolution of clinical cases	2h (2.8%)	
	Exam taking	3h (4.34%)	
	Course integrative product (CIP)	32h (46.3%)	
Independent study	Study	35h (68.6%)	42.5%= 51 hours
	Exam preparation	16h (31.3%)	
Total hours of the workload: 30 hours X 4 credits UANL/ECTS*		120h	

*European Credit Transfer and Accumulation System
1 UANL credit = 30 hours

NOTE: Rubrics, checklists and evaluation formats are elaborated by using the performance criteria described in each stage of the module.

SUPLEMENTO COVID-19

Siguiendo las recomendaciones de la Secretaría de Salud del país y la Rectoría de la Universidad, ante la coyuntura de salud COVID-19, la organización de la docencia desde marzo del 2020, seguirá un modelo híbrido, donde la docencia se ajustará a los horarios aprobados por la Secretaría de Salud siguiendo un modelo de Presencialidad / No presencialidad en la medida en que las circunstancias sanitarias y la normativa lo permitan. Los estudiantes asistirán a las clases de manera no presencial mediante la transmisión de las mismas de manera síncrona/asíncrona vía “on line”.