Kingdom of Saudi Arabia
Taibah University – Madinah
College of Applied Medical Sciences
Department of Clinical Laboratory Sciences

US IMAGING 1 (RAD 362) 1437-1438H

A- COURSE INFORMATION:

Course Code	Course Title	Credit Units			Study Level	Pre-requisites
		Total	Theory	Practical		
RAD-362	Ultrasound imaging (1)	2	1	2	6th	RAD-331
Course Coordinator		Extension		Email Address		
Dr. Mahmoud S. Babiker		None		mbabiker@taibahu.edu.sa		

B- COURSE DESCRIPTION:

The course is designed to provide the student with the principle of wave science and piezo-electric effect, basic knowledge about U/S. Beside the transducer components at the same time how to apply image formation analysis. Also to identify the Artifacts and biological effects of US and the principles of Doppler U/S.
Brief description of knowledge , skills and activities to be achieved:

- Describe the types of waves
- Define ultrasound waves
- Describe the piezo- electric effect.
- Demonstrate the transducer components.& ultrasound production .and types of transducer
- Know principle of image formation.
- Identify the types of US modes
- Describe the principle of Doppler US
- Applications of ultrasound in medical diagnosis
- Identify the Artifacts and biological effects of US.
- Advantage and disadvantage of ultrasound technique

C- COURSE OBJECTIVES:

This course enables the student to:

1. Demonstrate knowledge about the principle of the wave science of ultrasound
2. Understand the Piezo-electric effect.
3. Identify the transducer components & ultrasound production .and type of transducers.
4. Demonstrate the interaction of ultrasound with matters and image formation.
5. Identify the types of imaging.
6. Describe the principle of Doppler Effect.
7. Work with Doppler technique.
8. Recognize US image Artifacts and bio-effect.

D- THEORY TOPICS:

Weeks	Theory Topic	Hours
3	Principle ultrasound physics (Types of waves & interactions with mediums)	3
1	Piezoelectric effect	1
3	Transducer components.& ultrasound production and type of transducers	3

1	Image formation	1
2	Ultrasound modes: A, B and M modes.	2
3	Principles of Doppler ultrasound	3

E- PRACTICAL SESSIONS:

N of Weeks	Practical Session	Hours
1	US machine	2
1	Transducer components.& ultrasound production and type of transducers	2
4	US machine parameters & settings	8
2	Ultrasound echogenicity in B-Mode	4
3	How to image	6
2	Principles of Doppler ultrasound	4
1	Ultrasound imaging Artifacts	2
1	Revision	2

F- ASSESSMENT TASKS:

#	Type of assessment task	Week	Total Grades
1	Assignments (quizzes, seminars, ect)	During the semester	10%
2	Written Test (1)	Week 8	20%
3	Written Test (2)	Week 13	20%
4	Final Exam (practical)	Week 14	10%
5	Final Exam(theoretical)	Week 16	40%

G- LEARNING RESOURCES:

1- Required textbook:

- Reva Arrnez Curry & Betty Bates Tempkin. (2010 or the last edition). Exercises in Sonography: Introduction to normal structure and function. 2nd edition, Saunders.
- Stewart C. Bushong. (2009 or the last edition). Diagnostic Ultrasound: Essentials of Medical Imaging Series. Publisher: McGraw-Hill/Appleton & Lange; 1st edition. ISBN-10: 007012017X

Notes:

- Assignments topics and requirements shall be announced by the end of Week-1, the deadline for submission is 12pm Thursday of Week-10 (each semester).
- Assignments and written assessment tasks must be verified against plagiarism, the maximum acceptable percentage is determined by the department (according to each level).
- Continuous assessment methods may include quizzes, internet searches, home-works, exercises, class activity, scratch cards, presentations, group work, etc.
- Practical exams may contain hands-on experiments, laboratory work, simulations, or demonstrations.
- Written exams will include multiple-choice questions (MCQ), short essay questions, and long essay questions.