Sonography of Obstetrics/Gynecology (DMSO 2405)

Credit: 4 semester credit hours (3 hours lecture, 2 hours lab)

Course Description

Detailed study of the pelvis and obstretrics/gynecology as related to scanning techniques, patient history and laboratory data, transducer selection, and scanning protocols.

Required Textbook and Materials

1. *Diagnostic Medical Sonography: Obstetrics and Gynecology;* by Susan Raatz Stephenson and Julia Dmitrieva
    a. ISBN 978-1-4963-8551-2
2. *Workbook for Diagnostic Medical Sonography: A Guide to Clinical Practice, Obstetrics and Gynecology*
    a. ISBN 978-1-4963-8560-4

Course Objectives

Upon completion of this course, the student will be able to:

Identify the sonographic appearances of normal and abnormal female pelvis; identify normal and abnormal obstetrical findings; demonstrate appropriate scanning techniques using standard protocols; and evaluate patient history and laboratory data as it relates to sonography.

Course Outline

A. The Female Cycle
   1. Anatomy
   2. Physiology
   3. Female Reproductive Hormones
   4. Ovarian Cycle
   5. Abnormal Menstrual Cycle

B. Normal Anatomy of Female Pelvis:
   1. Pelvic Skeleton
   2. Pelvic Muscles
   3. Pelvic Organs
   4. Peritoneal spaces
   5. Pelvic ligaments
   6. Pelvic Vascular System
   7. Endovaginal Technique, Transducer Preparation, Orientation and Manipulation
   8. Follicular & Luteal Blood Flow
   9. Sectional anatomy
   10. Proper sonographic measurements

C. Doppler Evaluation of the Female Pelvis
   1. Patient History & Preparation
   2. Doppler Techniques
   3. Flow Pattern
   4. Normal Uterine Doppler
   5. Ovarian Doppler
   6. Pelvic Vasculature
   7. Doppler within the pelvis
   8. Sonographic technique
      a. Transabdominal
      b. Transvaginal
   9. Post partum uterus

D. Embryonic Development of the Female Pelvis
   1. Fetal Period
   1. Neonatal Period
   2. Premenarch through adulthood
   3. Gender formation
   4. Formation of the female pelvis

E. Congenital Anomalies of the Female Pelvis
   1. Agenesis
   2. Septums
   3. Unicornuate uterus
   4. Bicornuate
   5. Uterus didelphys
   6. Arcuate uterus
   7. DES exposure
   8. Sectional anatomy

F. Assessment of Fetal Age & Size 2nd & 3rd Trimesters
   1. Sectional anatomy
   2. BPD
   3. HC
   4. Cephalic Index
   5. AC
   6. FL
   7. Ultrasound report
   8. Proper sonographic measurements
   9. Measurement ratios
   10. Lateral ventricles
   11. Cisterna Magna
   12. Cerebellum
   13. Nuchal fold
   14. Fetal Anatomy
   15. Use of 3D/4D in OB/GYN

G. The Use of Ultrasound in the First Trimester
   1. Early development
   2. Placenta development
   3. Pregnancy tests
   4. Sonographic findings in early pregnancy
   5. Sonoembryology
   6. Determining GA early
   7. Nuchal translucency
   8. Sonography first trimester

H. The Fetal Environment
   1. Uterus: Lower UT segment & cervix
   2. Placenta
   3. Placenta grading
   4. Placenta location
   5. Umbilical cord
   6. Amniotic fluid
   7. AFI
   8. Scanning Techniques

I. Sonographic Assessment of the Neural Tube Structures
   1. Brain embryology
   2. Anatomic landmarks & biometry
   3. Scanning planes
   4. Sectional anatomy

5. Face
6. Fetal neck
7. Fetal spine
8. Fetal head & brain
9. Measuring lateral ventricles & cistern magna
10. Measuring size & shape of fetal head

J. Ultrasound of the Normal Fetal Chest, Abdomen & Pelvis
1. Scan planes
2. Fetal presentation
3. Fetal thorax
4. Fetal abdomen
5. Fetal genitals

K. Fetal Echocardiography
1. Embryology
2. Circulation
3. Sonographic techniques & anatomy

L. Doppler Ultrasound of the Normal Fetus
1. Bioeffects
2. Principles of Doppler
3. Scanning Technique
4. Doppler of Umbilical artery
5. Doppler of fetal aorta
6. Ductus venosus
7. IVC
8. Cerebral blood flow
9. Wave forms

M. The Biophysical Profile
1. Fetal breathing
2. Fetal movements
3. Fetal tone
4. Amniotic fluid volume
5. Scoring
6. Nonstress test
7. Clinical applications

N. Multiple Gestations
1. Clinical information
2. Clinical associations
3. Anatomy & Physiology
4. First trimester scanning
5. Second & Third trimester scanning

O. 3D & 4D Imaging in OB/Gyn
1. History
2. Volume ultrasound
3. Acquisition techniques
4. Obtaining a 3D volume
5. 3D multiplane reconstruction
6. Tomographic Ultrasound imaging
7. Render modes
8. 3D vs 4D
9. Clinical uses

P. Benign Disease of the pelvis
1. Benign cervix pathology
2. Benign endometrial pathology
3. Benign vaginal pathology
4. Benign ovarian pathology
5. Etiology
6. Clinical Signs and Symptoms
    i. Patient history
7. Sonographic Appearance
8. Related imaging & Other testing
9. Labs
10. Differential Diagnosis

Q. Malignant Disease of the Uterus & Cervix
1. Endometrial carcinoma
2. Leiomyosarcoma
3. Fallopian tube carcinoma
4. Carcinoma of the cervix
5. Gestational trophoblastic neoplasia
6. Clinical Signs and Symptoms
    i. Patient history
7. Sonographic Appearance
8. Related imaging & Other testing
9. Labs
10. Differential Diagnosis

R. Malignant Diseases of the Ovary
1. Risk Factors
2. Pathology
3. Spread and staging
4. Clinical considerations
    i. Patient history
5. Imaging diagnosis
6. Sonography of ovarian cancer
7. Differential diagnosis

S. Pelvic Inflammatory Disease & Endometriosis
1. Pelvic inflammatory disease
2. Endometriosis
3. Adenomyosis
4. Clinical Signs and Symptoms
    i. Patient history
5. Sonographic Appearance
6. Related imaging & Other testing
7. Labs
8. Differential Diagnosis

T. Assisted Reproductive Technologies (ART), Contraception, and Elective Abortion

1. Conception
2. Infertility
3. Sonographic assessments of pelvic organs
4. Assisted reproduction types
5. Treatment of infertility
6. Contraception types
    i. Normal and abnormal sonographic appearance M.
7. Elective abortions
8. Clinical Signs and Symptoms
    i. Patient history
9. Sonographic Appearance
10. Related imaging & Other testing
11. Labs
12. Differential Diagnosis

Grade Scale

93 – 100 A
92 – 85 B
84 – 77 C
76 - 69 D (not able to continue in sonography program)
68 and below F

Course Evaluation

Final grades will be calculated according to the following criteria:

Lecture is 85% of Grade	**Lab is 15% of Grade**
5% Quizzes/Participation/HW assignments	50% Lab Quizzes/Participation
95% Exams	50% Lab Tests (Protocol/Images)

Course Policies

1. No food, drinks, or use of tobacco products in class.
2. Cellphones and any other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. Students are expected to be in class unless prior arrangements have been made. Absences must be limited to serious illness and/or immediate family emergencies; unexcused absences are not allowed. *Three (3) absences will result in a letter grade reduction*. Excessive tardiness (more than 10 minutes/class or more than 2 consecutive classes) will result in an absence being awarded. **This includes lab!**
    a. In the event that LIT is forced to cancel classes due to inclement weather, DMS classes and clinical rotation will also be canceled. Notification of closures will be made through local radio and TV stations. Students out of the immediate broadcast area should contact the Program Director for information. *It is extremely important that students communicate with faculty regarding absences by telephone and/or email at all times.*
5. All assignments are due when stated. Late assignments are not accepted. Missed in-class assignments receive a grade of zero.

6. All exams will be on the dates specified unless the instructor makes a change. In case of an absence on exam day, the exam must be completed on the day the student returns to class or a grade of zero will be awarded
7. There is no extra credit given for this course.
8. You will have the length of the class to finish an exam. No extra time will be given.
9. It shall be considered a breach of academic integrity (cheating) to use or possess on your body any of the following devices during any examination unless it is required for that examination and approved by the instructor: Cell phone, smart watch/watch phone, laptop, tablet, electronic communication devices (including optical), and earphones connected to or used as electronic communication devices.
    a. Cheating on any (lecture/lab) exam results in immediate dismissal from the program and an F for the course.
10. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an 'F' in the course.
11. Please refer to the Diagnostic Medical Sonography Handbook for further policies.

Technical Requirements (for courses using Blackboard)

The latest technical requirements, including hardware, compatible browsers, operating systems, software, Java, etc. can be found online at: https://help.blackboard.com/en-us/Learn/9.1_2014_04/Student/015_Browser_Support/015_Browser_Support_Policy A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of the online technology and resources.

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building. You may also visit the online resource at http://www.lit.edu/depts/stuserv/special/defaults.aspx

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in

the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document

Starfish

LIT utilizes an early alert system called Starfish. Throughout the semester, you may receive emails from Starfish regarding your course grades, attendance, or academic performance. Faculty members record student attendance, raise flags and kudos to express concern or give praise, and you can make an appointment with faculty and staff all through the Starfish home page. You can also login to Blackboard or MyLIT and click on the Starfish link to view academic alerts and detailed information. It is the responsibility of the student to pay attention to these emails and information in Starfish and consider taking the recommended actions. Starfish is used to help you be a successful student at LIT.