Diagnostic Medical Ultrasound (DMU)

DMU 1000: Introduction to Diagnostic Medical Ultrasound
Introduction to the profession of diagnostic medical ultrasound. Imaging characteristics, educational requirements, professional trends. Observation opportunities. Graded on S/U basis only.
Credit Hour: 1
Prerequisites: Departmental consent required

DMU 4001: Topics in Diagnostic Medical Ultrasound
Organized study of selected topics in medical ultrasound. Topics may vary. May be repeated for credit. Graded on A-F basis only.
Credit Hour: 1-99
Prerequisites: restricted to Diagnostic Medical Ultrasound undergraduate students

DMU 4001W: Topics in Diagnostic Medical Ultrasound - Writing Intensive
Organized study of selected topics in medical ultrasound. Topics may vary. May be repeated for credit. Graded on A-F basis only.
Credit Hour: 1-99
Prerequisites: restricted to Diagnostic Medical Ultrasound undergraduate students

DMU 4085: Problems in Diagnostic Medical Ultrasound
Independent study leading to a special project or paper. May be repeated for credit. Graded on A-F basis only.
Credit Hour: 1-99
Prerequisites: restricted to Diagnostic Medical Ultrasound undergraduate students only

DMU 4085W: Problems in Diagnostic Medical Ultrasound - Writing Intensive
Independent study leading to a special project or paper. May be repeated for credit. Graded on A-F basis only.
Credit Hour: 1-99
Prerequisites: restricted to Diagnostic Medical Ultrasound undergraduate students only

DMU 4200: Principles of Diagnostic Medical Ultrasound
Principles and history of ultrasound, ultrasound equipment, sonographic techniques, aspects of patient care.
Credit Hours: 3
Prerequisites: Restricted to Diagnostic Medical Ultrasound students only

DMU 4234: Clinical Pathophysiology
(cross-leveled with DMU 7234). Abnormal function of organ systems in the presence of disease; clinical manifestations and medical management.
Credit Hours: 3

DMU 4234W: Clinical Pathophysiology - Writing Intensive
Abnormal function of organ systems in the presence of disease; clinical manifestations and medical management.
Credit Hours: 3

DMU 4309: Normal Ultrasound Clinical
(cross-leveled with DMU 7309). Integration of ultrasound instrumentation and clinical practice in a laboratory setting. Interaction between the sonographer, equipment and patient.
Credit Hours: 5
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 4311: Pathological Images of Ultrasound
(cross-leveled with DMU 7311). Disease presentation in ultrasound imaging. Practical aspects of ultrasound scanning techniques in pathology.
Credit Hours: 3
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 4312: Sectional Anatomy
(same as RA_SCI 4110; cross-leveled with DMU 7312, RA_SCI 7110). A study of human anatomy using the sectional approach; anatomical structures will be related to modern medical imaging techniques. Graded on A-F basis only.
Credit Hours: 3
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 4313: Ultrasound Physics
(cross-leveled with DMU 7313). Principles of diagnostic ultrasound physics. Sound wave characteristics, tissue interaction, power intensity, and Doppler physics.
Credit Hours: 3
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 4314: Abdominal Ultrasound
(cross-leveled with DMU 7314). Differentiation between normal and pathological ultrasound studies of the abdomen. Differential diagnosis of pathological states.
Credit Hours: 5
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 4315: Ultrasound Instrumentation
(cross-leveled with DMU 7315). Integration of ultrasound physics and instrumentation components in a laboratory setting. Practice in modes of operation and safety.
Credit Hours: 3
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 4318: Gynecology Ultrasound
Credit Hours: 3
Prerequisites: Restricted to Diagnostic Medical Ultrasound students
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
<th>Credit Hours</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMU 4320</td>
<td>Obstetrics Ultrasound (cross-leveled with DMU 7320). Study of normal and abnormal obstetrical</td>
<td>Ultrasound anatomy. Distinction between normal and pathological OB ultrasound studies with emphasis on differential diagnosis.</td>
<td>3</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
<tr>
<td>DMU 4322</td>
<td>Superficial Organs Ultrasound (cross-leveled with DMU 7322). Ultrasound evaluation and</td>
<td>Diagnosis of normal and abnormal superficial organs; thyroid gland, testes, breasts, soft tissues and musculoskeletal.</td>
<td>3</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
<tr>
<td>DMU 4325</td>
<td>Ultrasound Clinical Pharmacology and Contrast Agents (cross-leveled with DMU 7325). Study of</td>
<td>The biophysical, biochemical and complete action of ultrasound contrast agents and other drugs used in Diagnostic Medical Ultrasound and their pharmacodynamics.</td>
<td>3</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
<tr>
<td>DMU 4326</td>
<td>Vascular Ultrasound Physics, Instrumentation and Hemodynamics (cross-leveled with DMU 7326).</td>
<td>Study of vascular principles and fundamentals including physics and instrumentation. Emphasis on ultrasound wave characteristics, Doppler principles, tissue interaction and hemodynamics.</td>
<td>3</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
<tr>
<td>DMU 4330</td>
<td>Vascular Ultrasound Lab (cross-leveled with DMU 7330). Vascular ultrasound scanning</td>
<td>Techniques, protocols, measurements, film/video critique, and Plethysmography in a clinical lab setting.</td>
<td>3</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
<tr>
<td>DMU 4332</td>
<td>Vascular Ultrasound (cross-leveled with DMU 7332). Vascular ultrasound for normal and</td>
<td>Pathological processes: study of disease, correlation of patients’ clinical data and ultrasound findings used in differential diagnosis.</td>
<td>4</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
<tr>
<td>DMU 4342</td>
<td>Adult Cardiac Ultrasound (cross-leveled with DMU 7342). Provides principles of diagnostic adult</td>
<td>Cardiac ultrasound in relation to pathology, further presenting the practical aspects of scanning techniques, exam critique, patient care in relation to cardiac US exams. Graded on A-F basis only.</td>
<td>5</td>
<td>DMU 4313, DMU 4315 and DMU 4338; instructor's consent</td>
</tr>
<tr>
<td>DMU 4341</td>
<td>Ultrasound Clinical I (cross-leveled with DMU 7941). Application of medical ultrasound in</td>
<td>Supervised clinical settings. Decisions regarding diagnosis, patient handling and imaging.</td>
<td>7</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
<tr>
<td>DMU 4943</td>
<td>Ultrasound Clinical III (cross-leveled with DMU 7943). Final clinical application of general</td>
<td>Medical ultrasound practicum in supervised clinical settings. Further enhancement of practice, decision making, patient handling, image processing and case studies.</td>
<td>6</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
<tr>
<td>DMU 4944</td>
<td>Vascular Ultrasound Clinical IV (cross-leveled with DMU 7944). Application of diagnostic vascular</td>
<td>Ultrasound in supervised clinical settings: practice, decision making, patient handling and image processing.</td>
<td>7</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
<tr>
<td>DMU 4945</td>
<td>Cardiac Ultrasound Clinical V (cross-leveled with DMU 7945). Application of ultrasonography in</td>
<td>Real clinical settings for learning, practicing and decision making regarding, patient handling and imaging process with students supervised in a clinical setting. Graded on A-F basis only.</td>
<td>6</td>
<td>DMU 4313, DMU 4315, and DMU 4944. Instructor and Departmental permission required</td>
</tr>
<tr>
<td>DMU 4946</td>
<td>Cardiac Ultrasound Clinical VI (cross-leveled with DMU 7946). Further application of ultrasonography</td>
<td>For continuation of learning, practicing and decision making, patient handling and imaging process with students supervised in a clinical setting.</td>
<td>6</td>
<td>DMU 4313, DMU 4315, DMU 4338 and DMU 4945. Instructor and Departmental permission required</td>
</tr>
<tr>
<td>DMU 4993</td>
<td>Ultrasound Clinical II (cross-leveled with DMU 7993). Application of medical ultrasound in</td>
<td>Supervised clinical settings with practice and decision making related to ultrasound diagnosis, patient handling and image processing.</td>
<td>8</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
<tr>
<td>DMU 7200</td>
<td>Diagnostic Medical Ultrasound Principles and Patient Care (cross-leveled with DMU 7993).</td>
<td>Introduction diagnostic medical ultrasound principles including history, development, ultrasound physics - equipment fundamentals. Provides introduction to concepts of sonographic techniques, positioning, image critique, aspects of patient care and professional organizations. Graded on A-F basis only.</td>
<td>3</td>
<td>Restricted to Diagnostic Medical Ultrasound students</td>
</tr>
</tbody>
</table>
### Prerequisites
- Restricted to Graduate Diagnostic Medical Ultrasound students

#### DMU 7234: Clinical Pathophysiology
(cross-leveled with DMU 4234). Abnormal function of organ systems in the presence of disease; clinical manifestations and medical management.

**Credit Hours:** 3

#### DMU 7309: Normal Ultrasound Clinical
(cross-leveled with DMU 4309). Integration of ultrasound instrumentation and clinical practice in a laboratory setting. Interaction between the sonographer, equipment and patient.

**Credit Hours:** 5

**Prerequisites:** admitted to the DMU program

#### DMU 7311: Pathological Images Ultrasound
(cross-leveled with DMU 4311). Disease presentation in ultrasound imaging. Practical aspects of ultrasound scanning techniques in pathology.

**Credit Hours:** 3

**Prerequisites:** Restricted to Diagnostic Medical Ultrasound students

#### DMU 7312: Sectional Anatomy
(same as RA_SCI 7110; cross-leveled with DMU 4312, RA_SCI 4110). A study of human anatomy using the sectional approach; anatomical structures will be related to modern medical imaging techniques. Graded on A-F basis only.

**Credit Hours:** 3

**Prerequisites:** Restricted to Graduate Diagnostic Medical Ultrasound students

#### DMU 7313: Ultrasound Physics
(cross-leveled with DMU 4313). Principles of diagnostic ultrasound physics. Sound wave characteristics, tissue interaction, power intensity, and Doppler physics.

**Credit Hours:** 3

**Prerequisites:** Restricted to Diagnostic Medical Ultrasound students

#### DMU 7314: Abdominal Ultrasound
(cross-leveled with DMU 4314). Differentiation between normal and pathological ultrasound studies of the abdomen. Differential diagnosis of pathological states.

**Credit Hours:** 5

**Prerequisites:** Restricted to Diagnostic Medical Ultrasound students

#### DMU 7315: Ultrasound Instrumentation
(cross-leveled with DMU 4315). Integration of ultrasound physics and instrumentation components in a laboratory setting. Practice in modes of operation and safety.

**Credit Hours:** 3

**Prerequisites:** Restricted to Diagnostic Medical Ultrasound students

#### DMU 7318: Gynecology Ultrasound

**Credit Hours:** 3

**Prerequisites:** Restricted to Diagnostic Medical Ultrasound students

#### DMU 7320: Obstetrics Ultrasound
(cross-leveled with DMU 4320). Study of normal and abnormal obstetrical ultrasound anatomy. Distinction between normal and pathological OB ultrasound studies with emphasis on differential diagnosis.

**Credit Hours:** 3

**Prerequisites:** Restricted to Diagnostic Medical Ultrasound students

#### DMU 7322: Superficial Organs Ultrasound
(cross-leveled with DMU 4322). Ultrasound evaluation and diagnosis of normal and abnormal superficial organs; thyroid gland, testes, breasts, soft tissues and musculoskeletal.

**Credit Hours:** 3

**Prerequisites:** Restricted to Diagnostic Medical Ultrasound students

#### DMU 7325: Ultrasound Clinical Pharmacology and Contrast Agents
(cross-leveled with DMU 4325). Study of the biophysical, biochemical and complete action of ultrasound contrast agents and other drugs used in DMU and their pharmacodynamics.

**Credit Hours:** 3

**Prerequisites:** Restricted to Graduate Diagnostic Medical Ultrasound majors

#### DMU 7326: Vascular Ultrasound Physics, Instrumentation and Hemodynamics
(cross-leveled with DMU 4326). Study of vascular principles and fundamentals including physics and instrumentation. Emphasis on ultrasound wave characteristics, Doppler principles, tissue interaction and hemodynamics.

**Credit Hours:** 3

**Prerequisites:** Restricted to Diagnostic Medical Ultrasound students

#### DMU 7330: Vascular Ultrasound Lab

**Credit Hours:** 3

**Prerequisites:** Restricted to Diagnostic Medical Ultrasound students

#### DMU 7332: Vascular Ultrasound
(cross-leveled with DMU 4332). Vascular ultrasound for normal and pathological processes: study of disease, correlation of patients' clinical data and ultrasound findings used in differential diagnosis.

**Credit Hours:** 4

**Prerequisites:** Restricted to Diagnostic Medical Ultrasound students
DMU 7338: Cardiac Ultrasound, Principles and Hemodynamics (cross-leveled with DMU 4338). Study of cardiac ultrasound fundamentals including: wave characteristics, principles of 2-D/3-D/4-D imaging, M-mode, and Doppler, cardiac anatomy and physiology, embryology, evaluation methods and hemodynamics. Graded on A-F basis only.
Credit Hours: 3
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 7342: Adult Cardiac Ultrasound (cross-leveled with DMU 4342). Study of adult cardiac ultrasound for normal and pathological processes. Differential diagnosis of cardiac disease through correlation of patients’ clinical data and ultrasound findings.
Credit Hours: 5
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

Credit Hours: 7
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

Credit Hours: 6
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 7944: Vascular Ultrasound Clinical IV (cross-leveled with DMU 4944). Application of diagnostic vascular ultrasound in supervised clinical settings: practice, decision making, patient handling and image processing.
Credit Hours: 7
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 7945: Cardiac Ultrasound Clinical V (cross-leveled with DMU 4945). Application of diagnostic cardiac ultrasound in supervised clinical settings: practice and decision making regarding echocardiography, patient handling and image processing.
Credit Hours: 6
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 7946: Cardiac Ultrasound Clinical VI (cross-leveled with DMU 4946). Further enhancement of diagnostic cardiac ultrasound in supervised clinical settings: practice and decision making regarding echocardiography, patient handling and image processing.
Credit Hours: 6
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 7993: Ultrasound Clinical II (cross-leveled with DMU 4993). Application of medical ultrasound in supervised clinical settings with practice and decision making related to ultrasound diagnosis, patient handling and image processing.
Credit Hours: 8
Prerequisites: Restricted to Graduate Diagnostic Medical Ultrasound students

DMU 8001: Topics in Diagnostic Medical Ultrasound
Organized study of selected topics. Topic may vary.
Credit Hour: 1-3
Prerequisites: restricted to students enrolled in the Diagnostic Medical Ultrasound program only

DMU 8050: Research in Diagnostic Medical Ultrasound
Research not leading to a thesis or dissertation. Graded on an A-F basis only.
Credit Hour: 1-99
Prerequisites: restricted to students enrolled in the Diagnostic Medical Ultrasound program only

DMU 8085: Problems in Diagnostic Medical Ultrasound
Independent study of a special project involving clinical applications or research. Topic may vary.
Credit Hour: 1-99
Prerequisites: restricted to students enrolled in the Diagnostic Medical Ultrasound program only

DMU 8346: Pediatric Cardiac Ultrasound
Study of pediatric cardiac ultrasound for normal and pathological processes. Differential diagnosis of cardiac disease through correlation of patients’ clinical data and ultrasound findings.
Credit Hours: 4
Prerequisites: Restricted to Diagnostic Medical Ultrasound students

DMU 8947: Applied Clinical Research & Practicum
Clinical research application of cardiovascular & general ultrasound in clinical environment: clinical research, practicum, decision making, patient handling, and image processing. Graded on A-F basis only.
Credit Hour: 5-8
Prerequisites: Restricted to Diagnostic Medical Ultrasound students