COURSE DESCRIPTION

This course will provide the radiologic science professional a knowledge and history of bone densitometry. This course will cover various topics such as: densitometry techniques, skeletal anatomy in densitometry, statistics and quality control. External and internal factors that affect bone density will also be covered. Patient issues such as risk fracture prediction, diagnosing osteoporosis, radiation exposure, and appropriate candidates for bone density studies will also be included in this course.

COURSE GOALS

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

1. Identify various bone density measurement techniques.
2. Calculate statistical data.
3. Identify proper skeletal anatomy.
4. Explain internal and external factors that affect bone density measurements.
5. Know radiation dose levels received by the patient.
7. Explain bone density measurements.
8. Summarize quality control methods.

**TEXTBOOK (required)**


**EVALUATION**

A variety of strategies will be utilized to validate student learning. Students must participate in all strategies to receive a passing grade for the course. A brief description of the strategy will follow the assessment summary. NOTE: This instructor does NOT round up grade averages.

Unless you have 12 hours from MSU prior to August 31, 2006, you MUST make a grade of “C” or higher in all of your professional courses for them to count toward graduation. A professional course grade of “D” or lower MUST be repeated.

<table>
<thead>
<tr>
<th>INITIAL ENROLLMENT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Examinations</td>
<td>30%</td>
</tr>
<tr>
<td>QC chart assignment</td>
<td>5%</td>
</tr>
<tr>
<td>Shewhart chart assignment</td>
<td>5%</td>
</tr>
<tr>
<td>Therapeutic medication assignment</td>
<td>5%</td>
</tr>
<tr>
<td>Phantom scan assignment</td>
<td>5%</td>
</tr>
<tr>
<td>Forum Participation</td>
<td>10%</td>
</tr>
<tr>
<td>Comprehensive Final</td>
<td>40%</td>
</tr>
</tbody>
</table>
For all activities related to this course:

Course Communication:

Contact information for the instructor is listed at the beginning of this syllabus. Email is the preferred mode of communication. Communication from the instructor to the student will be through the student’s Midwestern State University e-mail account and/or the course. If you have not established this account, do so as soon as possible by going to: http://infosys.mwsu.edu/email.asp. The instructor will respond or at least acknowledge email messages from students within a maximum of five (5) business days when MSU is in session. Beyond standard university holidays and breaks, the instructor will notify students of any extended periods of time when email contact is not practical (professional meetings, etc). You will also find information regarding deadlines and other important course related material in the Course Calendar located on the home page. Open the calendar and click on the date to open dialogue boxes.

Course calendar:

Remember to check the course calendar (click the date on the date box if something is written there, chances are there is an important message) and also the evaluation tools for the dates of availability and expiration. NOTE: No two courses and faculty are alike. A faculty who teaches multiple courses in one semester may have different availability and expiration times for each course. Please be aware of the expiration dates and times for the quizzes. When reading entries on the calendar, or viewing the calendar week when you sign into WeCT/Blackboard, you may come across the term “ALL DAY” or 12 am – 11:59 pm. All this refers to is how long the item can be viewed on the calendar. Simply put, if there is an item placed in the date box and it says all day in front of the entry, you will be able to see it all day. This does not refer to how long you have to turn in assignments and meet deadlines or expiration date for quizzes. Posted expiration dates along with assignment due dates and deadlines found at the end of the syllabus will be strictly enforced.

Once a quiz has expired, it can no longer be accessed. Once an assignment is past due, it will NOT be graded.

Unit Examinations (30%)

Each unit of study has a complimentary examination. Students should complete each examination on-line, submit the exam, then the student will receive
immediate feedback. Please remember that you can always check your scores on-
line, just review the icons.

Assignments:

All you need to do to successfully complete the chart assignments and the quality
control assignment is to perform twenty (20) scans on the phantom used to
calibrate the DEXA scanner. It is recommended that you perform all twenty scans
on one day. Keep the results of those scans and use the numbers for the criteria
needed to complete those assignments.

All assignments must have a properly formatted APA cover/title page. The title
page will have the following information:

- Properly placed and spelled running head and page number
- Title
- Author
- University Affiliation
- Course number and name
- Date
- Instructor’s name

To learn about proper APA formatting, it is recommended that you purchase the
second edition of the APA manual. You can also visit the following websites for
information: The Owl at Purdue at: http://owl.english.purdue.edu/ or take time to
view the APA tutorial at: http://flash1r.apa.org/apastyle/basics/index.htm

QC chart Assignment (5%) Develop a QC chart similar to the one in the text.

1. Show twenty (20) points for the chart. Each point will be representative of one
L1-L4 BMD g/cm² measurement.
2. From your twenty points, use the first ten (10) to determine what your average
L1-L4 BMD g/cm² will be.
3. Use the control limits of ± 1.5.
4. Indicate a point at which values show a downward trend.
5. Indicate violations of the 1.5% rule.

Show all work that leads you to your conclusions.

* NOTE: All assignments MUST be DELIVERED to me as an attachment in the
assignment drop-box found on the left side of the course homepage. Any
assignment that is received after the deadline will not be accepted or graded.
Check the Course Calendar for important dates and deadlines. There is also a tentative schedule at the end of this syllabus. Each written assignment will be done as a Word document only and only in one file. I will not accept multiple files for one assignment. Deadline for this assignment is Friday, June 8 at midnight.

**Shewhart chart assignment (5%)**

Develop a Shewhart chart similar to the one in the text. Zero will indicate your z-score and your SD’s will be +3 and -3. Plot twenty (20) points for the chart. Use the same data that was used for the QC chart assignment. From your twenty points, determine if the following rules have been violated.

1. Phantom BMD value exceeded the average ± 3 SD.
2. Two consecutive phantom BMD values on the same side of the average exceeding the average by ± 2 SD.
3. Two consecutive phantom BMD values differing by more than 4 SD.
4. Four consecutive phantom BMD values on the same side of the average exceeding the average by ± 1 SD.
5. Ten consecutive phantom BMD values falling on the same side of the average regardless of their distance from the average.
6. Determine if there is a machine failure based on the above information.

Show all work that leads you to your conclusions.

*NOTE:* All assignments MUST be DELIVERED to me as an attachment in the assignment drop-box found on the left side of the course homepage. Any assignment that is received after the deadline will not be accepted or graded. Check the Course Calendar for important dates and deadlines. There is also a tentative schedule at the end of this syllabus. Each written assignment will be done as a Word document only and only in one file. I will not accept multiple files for one assignment. Deadline for this assignment is Friday, June 22 at midnight.

**Therapeutic medication assignment (5%)**

Research one of the approved drugs used for the treatment of osteoporosis. Answer the following questions:

1. Identify the manufacturer’s name and the trade name for the drug.
2. Indications for use of the drug.
3. Contraindications for use of the drug.
4. Chemical make-up of the drug. (chemically known as or the empirical formula)
5. For who is the drug approved.
Quality Control (phantom scan) assignment (5%)

Perform ten scans on the same day to a phantom, from the information you obtain, find:

1. The average value of the 10 scans.
2. The 1.5% of the average value of the scan.
3. Range of values.

Show all work that leads you to your conclusions.

Bulletin Board Participation (10%)

A bulletin board is established for the course. Students should visit the board at least once a week during the semester and submit, at a minimum, one reply or post per visit. Participation in this type of classroom discussion accounts for 10% of the course grade and students should designate a time each week to participate in this class activity. Meeting the requirement on one day at the end of the semester does not constitute active participation. If this occurs, the student will not get credit for this portion of the course.

Each student must post one discussion-type question** on the forum for class discussion during the semester and it must be related to course topics. Each student must respond to each posted question. I will count participation only when responses and questions are course related. One or two word responses do not count as discussion. This is a forum where you can share knowledge and pass information to one another. “I agree” is not a response someone can learn...
from or build a discussion from. The student posting the question will serve as the resource for the discussion by their classmates.

**PLEASE NOTE**: In order for the instructor to maintain an accurate accounting of the questions posted, and to ensure proper credit is given as well as appropriateness of the question, the student must e-mail the question to the instructor for approval prior to posting. Questions submitted without instructor's approval will **NOT** receive credit.

The forum is designed to encourage interaction between course students. Have fun with this activity but take it seriously because it does contribute to your course grade. Please make sure questions are course related when submitting them to the instructor for approval. Remember that posting a question will account for a significant portion of the course participation grade. This portion of the course grade will be based upon two things: posting a question & replying to any course related questions/comments from classmates. Please check the calendar at the end of this syllabus for BBS closing dates.

**What is a "discussion-type question"?** A discussion-type question is one that does not necessarily have a right or wrong answer, unlike a "factual question". If I ask what is the sum of 2 + 2, we know that (hopefully) that the answer is 4 -- That is a "fact" & there is no room for discussion. There is a right answer & an unlimited number of wrong answers.

Comprehensive Final (40%)

Student Responsibility/ Final Exam:

Do not plan or schedule personal trips or vacations during the final exam schedule. All final examinations will be administered during the designated date(s) and time(s) listed in the calendar and/or syllabus. There will be **NO** alteration of any type to this schedule.

Extenuating circumstances may be discussed and an alternative arrangement may be made at the discretion of the instructor.

**Note**: Any decision by the instructor is final and there will be no further changes made.

The final will be comprehensive over all course content and open book. Please schedule the time for the final as discussed in the course policy section. ALL students are required to obtain and correctly fill out a proctor application form. Make sure all information is legible. Please remember to complete the Proctor Approval form early and that the exam will be administered on-line. This means that the Proctor must have Internet access that will permit them to access the
course. The unit objectives, study guides, and examinations can be utilized to review for the final. NOTE: Missing the deadline for submission of the proctor application will result in this instructor sending out one reminder to fulfill your responsibility. If I do not receive a proctor form you will not be allowed to take the final examination.

**Remember to check the course calendar and the evaluation tools for the dates of availability and expiration.** Once the final has expired, it can no longer be accessed.

**Honor System:**

RADS 3833 adheres to the MSU Code of Conduct. In particular, academic dishonesty, however small, creates a breach in academic integrity. A student’s participation in this course comes with the expectation that his or her work will be completed in full observance of the MSU Code of Student Conduct. A student should consult the current Student Handbook for answers to any questions about the code.

Many components of RADS 3883 are designed to be highly interactive with students helping each other learn. Students are encouraged to take full advantage of many resources available including online WebCT course resources, Internet sites, other textbooks and journals, faculty, and peers when answering objectives. This interactive collegial learning environment is conducive for life-long learning.

**PLEASE NOTE:** By enrolling in this course, the student expressly grants MSU a “limited right” in all intellectual property created by the student for the purpose of this course. The “limited right” shall include but not be limited to the right to reproduce the student’s work product in order to verify originality and authenticity, and for educational purposes.

Specific components of RADS 3773 are designed to represent the efforts of each student INDIVIDUALLY and are NOT to be shared. These components include the WebCT Open Book Module Quizzes and the WebCT Comprehensive Final Exam. When students submit their efforts for grading, they are attesting they abided by this rule.

**Special Note**

The module will consistently refer to a particular chapter and page of the textbook related to the content being presented in the module. For ease of referencing the textbook location will be identified in the module by placing the chapter first and the page number second. These will be in a parenthesis at the appropriate location in the module. For example chapter one, page one will be identified in this manner (ch.1, p.1). Please be aware of all deadlines. Check the course calendar
for dates and times when all assignments and requirements for this course are due.

**Tentative course schedule:**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Availability</th>
<th>Expiry Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quiz 1</strong></td>
<td>Available: May 28 @ 7am</td>
<td>Expires: June 6 @ midnight</td>
</tr>
<tr>
<td><strong>Quiz 2</strong></td>
<td>Available: June 6 @ 7am</td>
<td>Expires: June 18 @ midnight</td>
</tr>
<tr>
<td><strong>Quiz 3</strong></td>
<td>Available: June 18 @ 7am</td>
<td>Expires: June 27 @ midnight</td>
</tr>
<tr>
<td><strong>Quiz 4</strong></td>
<td>Available: June 27 @ 7am</td>
<td>Expires: July 9 @ midnight</td>
</tr>
<tr>
<td><strong>Quiz 5</strong></td>
<td>Available: July 9 @ 7am</td>
<td>Expires: July 18 @ midnight</td>
</tr>
<tr>
<td><strong>Quiz 6</strong></td>
<td>Available: July 18 @ 7am</td>
<td>Expires: July 27 @ midnight</td>
</tr>
<tr>
<td><strong>Proctor form</strong></td>
<td>Due on or before 6-29-12 @ 5 pm</td>
<td></td>
</tr>
<tr>
<td><strong>QC Chart Assignment</strong></td>
<td>Due: June 8 @ midnight</td>
<td></td>
</tr>
<tr>
<td><strong>Shewart Chart Assignment</strong></td>
<td>Due: June 22 @ midnight</td>
<td></td>
</tr>
<tr>
<td><strong>Therapeutic medication assignment</strong></td>
<td>Due: July 6 @ midnight</td>
<td></td>
</tr>
<tr>
<td><strong>Quality Control (phantom scan) assignment</strong></td>
<td>Due: July 20 @ midnight</td>
<td></td>
</tr>
<tr>
<td><strong>BBS</strong></td>
<td>Closes for question: July 6 @ 1pm</td>
<td>Closes completely: July 20 @ midnight</td>
</tr>
<tr>
<td><strong>Comprehensive final</strong></td>
<td>Available: July 30 @ 7am</td>
<td>Expires on August 1 @ 5 pm</td>
</tr>
</tbody>
</table>

**Class Meeting Date and Time:** The scheduled meetings for class are Fridays in Bridwell Hall, room 305 between 7 and 8 pm. This is not a mandatory meeting and you are not required to attend. If any student would like to meet with the instructor of this course, you must make arrangements to do so prior to the meeting time.