EMR 6410
Fundamentals of Measurement in the Behavioral Sciences

http://www.gowmu.wmich.edu
http://homepages.wmich.edu/~applegab/courses/emr6410.html

Course Pack Topics

Course Catalogue Description 2
Course Details 2
Instructional Objectives 3
Professional Concerns 3
Evaluation Policy 5
Digital Drop Box 6
Homework Policy 6
Homework Descriptions 7
Weekly Topic List 8
Selected Bibliography 9
Course Catalogue Description

The criteria by which instruments are selected and developed serve as the central focus of this course. Information regarding the theory and practice of measurement and testing are applied across educational, social, and behavioral settings. Students are expected critically to evaluate instrumentation as well as to develop a plan for the creation of an instrument.

Course Details

Prerequisite
Successful completion of EMR 6400 Introduction to EMR and (or concurrent enrollment in) EMR 6450 Elementary Statistics or equivalents as approved by instructor.

Credit and Clock Hours
3 Semester hours
Monday 6:00 to 8:45 PM
Classroom: 3310 Sangren Hall

Instructor
Brooks Applegate, Ph.D.
Educational Leadership, Research & Technology
3571 Sangren Hall
V: 269-387-3886
F: 269-387-3696

brooks.applegate@wmich.edu
Skype ID: brooks.applegate

Personal Course Web Site
http://homepages.wmich.edu/~applegab/courses/emr6400.html

WMU eLearning Web Site Portal
https://elearning.wmich.edu

Technical Support
Western Michigan University Office of Instructional Technology:
Helpdesk; http://www.wmich.edu/oit/helpdesk/index.html
Hours: 8am-10pm (Monday-Friday, EST)
Phone (269) 387-HELP (387-4357)
Email: HELPDESK@WMICH.EDU

EMR 6410 Fall 2013 2
Office Hours
Monday 1:00 – 2:30 pm and by appointment

Required Texts

Instructional Objectives
The student will be able to:
• Identify and differentiate among different forms of reliability evidence appropriate for different test/assessment purposes.
• Identify and differentiate among different forms of validity evidence appropriate for different test/assessment purposes.
• Select appropriate methods for estimating the reliability and validity of an assessment for a particular use.
• Differentiate CTT and IRT.
• Describe 1, 2, 3 parameter IRT models.
• Describe how Generalizability Theory extends CTT treatment and estimation of reliability.

Professional Concerns
You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate and Graduate Catalogs that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. [The policies can be found at http://catalog.wmich.edu and http://www.wmich.edu/catalog under Academic Policies, Student Rights and Responsibilities.] If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.
**Need for Accommodations**

Any student with a documented disability (e.g., physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the professor and the appropriate Disability Services office at the beginning of the semester. The two disability service offices on campus are: Disabled Student Resources and Services 269-387-2116 and the Office of Services for Students with Learning Disabilities 269-387-4411.

**Diversity Statement**

The Department of Educational Leadership, Research & Technology (ELRT) EMR program maintains a strong and sustained commitment to the diverse and unique nature of all learners and high expectations for each student.

**WMU Plagiarism and Academic Honesty Supplementary Syllabus Statement**

Students who take this class must be prepared to submit electronic copies of some or all assignments. The University expects that all students will be evaluated and graded on their own work. If you use language, data, or ideas from other sources, published or unpublished, you must take care to acknowledge and properly cite those sources. Failure to do so may constitute plagiarism or other violation of University academic honesty policies (refer to the Undergraduate or Graduate catalogs for details). To detect and deter plagiarism, encourage responsible student behavior, improve student learning, and ensure greater accountability, assignments for this class may be submitted for textual similarity review to Turnitin.com and/or other resource. Use of the Turnitin.com service is subject to the Terms and Conditions of Use posted on the Turnitin.com website.

Papers that are submitted to Turnitin.com become part of the Turnitin.com database (student identities are protected) solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Terms and Conditions of Use posted on the Turnitin.com site. Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Terms and Conditions of Use posted on the Turnitin.com site.

If you wish to request that your paper(s) not be included in the Turnitin.com reference database, I need to receive your request in writing prior to submission of any course assignments; the paper(s) can then be processed and reviewed accordingly.

EMR 6410 Fall 2013
The results of a Turnitin.com originality report or other resources may be used as evidence to charge you with plagiarism or other offense. If that is the case, you will be given the opportunity to respond per the regular institutional process and procedures that govern student academic conduct (http://osc.wmich.edu/academicintegrity/).

Evaluation Policy

Course grades are based on total points from homework assignments and exams, including extra credit homework and exam problems. However, regardless of total points, no student who fails the final examination will receive an "A" grade in the course. Professionalism in all course-related endeavors and active class participation is expected. All work will be evaluated based on accuracy, adherence to guidelines and due dates, thoroughness and evidence of effort, evidence of professionalism, evidence of data integration, coherence, and appearance. Be sure to check, proof, and edit all work submitted.

Methods of Evaluation

In order to benefit most from your study of this course material, you are expected to read the course text, all related documents and journal articles, complete assignments related to course topics, and document mastery of course content through a midterm and final exam. Timely completion and the quality of your work will contribute to your overall course grade. In fairness to all, a penalty will be imposed for any work submitted late. Generally speaking the penalty will be equivalent to one letter grade or more. Extenuating circumstances will be considered with proper documentation.

Attendance and Participation in Class

Regular and punctual class attendance is expected of all students. A student will be dropped from a course and assigned a failing grade for excessive absences. Excessive absences are attending less than 80% of scheduled class meetings. One absence will be accepted without affecting your participation grade. Be prepared to discuss problems and readings as a class or in cooperative groups. If you have questions, you may ask them in class, or via email, as it is your responsibility to gain clarification. We will do supplementary reading for this class. If you have to be absent, please make arrangements to get materials/notes from a classmate or instructor. Regardless of the reason, you cannot receive credit for participation if you are not present to participate.

Course Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100 - 95%</td>
</tr>
<tr>
<td>BA</td>
<td>94 - 90%</td>
</tr>
<tr>
<td>B</td>
<td>89 - 85%</td>
</tr>
<tr>
<td>CB</td>
<td>80 - 84%</td>
</tr>
<tr>
<td>C</td>
<td>79 - 75%</td>
</tr>
<tr>
<td>E</td>
<td>Below 75%</td>
</tr>
</tbody>
</table>

EMR 6410 Fall 2013
Digital Drop-Box

Students are required to submit certain assignments to the digital drop-box via the online course web site (WMU D2L eLearning) in Microsoft Word file format only. If you are unable to meet this requirement, please inform the instructor immediately. The MS Word attachment requirement allows for easy handling from the course instructor back to the students (with feedback included within the attached document).

Save the completed MS Word file. All assignments will be saved so that the instructor knows (by the filename) who is dropping the assignment, which assignment is included: For example, John Doe - Assignment #3 - EMR6410: DoeHMK3.doc. The student’s last name MUST be included within the file name. Please do not e-mail the instructor to check on the status of an assignment placed in the digital drop box. If you need verification that I received your email simply CC yourself, if you got it, then so did I. Failure to follow these directions may result in a misplaced assignment, lower grade and untimely feedback.

The following information MUST be included at the top of all assignments on a separate page dropped into the Digital Drop Box:

1. Your name & email address
2. EMR6410
3. Assignment #/Subject
4. Date

Example
Brooks Applegate: brooks.applegate@wmich.edu
EMR6410
Assign #1: Test & Item Scoring
9/21/11

The simplest way to do this is to create a template page with the necessary information as the face page for all homework submissions.

Homework Policy

Homework will be accepted up to 1 class meeting past the due date and can only receive a maximum of 50% of the available points for that assignment unless prior arrangements are made with the instructor. All homework write-ups (when appropriate) are to be typed in APA style (a title page is not necessary). SAS and/or

EMR 6410 Fall 2013
SPSS program scripts and output are to be included as an attachment if computer work is required by the assignment. Homework is due by email as a MS Word attachment prior to the start of the next class following the assignment unless otherwise indicated by the instructor. In your email include the course prefix and number and exercise number in the email SUBJECT field (e.g., EMR6410 Proj2), I program an email filter which filters on “EMR6410” to direct your emails to a specific folder location, failure to follow these directions may result in a misplaced assignment, lower grade and untimely feedback.

Extra credit homework opportunities are offered throughout the semester.

**EMAIL (2 pts EC)**
Due 9/13/13
Post an introduction of you to the course eLeaning web site Intro Blog. Tell your classmates, and me something about yourself and why you are taking this class. I’d also like to know what experiences you have had related to constructing any measuring instrument, e.g., classroom test, survey questionnaires.

**Homework Descriptions**

Validity or scaling or G-theory?

**Project #1 Scale Choices and Item & Composite Variance**
Due 9/30/13
Posted to the web are detailed directions for this project.

**Project #2 Estimating Test Reliability**
Due 10/21/13
Posted to the web are detailed directions for this project.

**Project #3 Item/Test Analysis (CTT & IRT)**
Due 11/18/13
Posted to the web are detailed directions for this project.

**Project #4 Assessment/Test Review & Critique**
Due 12/9/13
Posted to the web are detailed directions for this project.
## Weekly Topic List

<table>
<thead>
<tr>
<th>Week</th>
<th>Reading</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: 9/9/13</td>
<td>C&amp;A 1&amp;3</td>
<td>Need for Test Theory &amp; Measurement</td>
</tr>
<tr>
<td>2: 9/16/13</td>
<td>C&amp;A 2&amp;19</td>
<td>Basic Statistics &amp; Norms &amp; Std Scores</td>
</tr>
<tr>
<td>3: 9/23/13</td>
<td>C&amp;A 4</td>
<td>Test Construction</td>
</tr>
<tr>
<td>4: 9/30/13</td>
<td>C&amp;A 5&amp;17</td>
<td>Score Composites &amp; Scoring Methods</td>
</tr>
<tr>
<td>5: 10/7/13</td>
<td>C&amp;A 6</td>
<td>CTT: Reliability &amp; SEM</td>
</tr>
<tr>
<td>6: 10/14/13</td>
<td>C&amp;A 7</td>
<td>CTT: Reliability Estimation Methods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AEA in Washington, DC 10/16/13 - 10/19/13</td>
</tr>
<tr>
<td>7: 10/21/13</td>
<td>C&amp;A 8</td>
<td>Generalizability Theory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In Class Midterm (Ch 1-7, 17, 19)</td>
</tr>
<tr>
<td>8: 10/28/13</td>
<td>C&amp;A 9</td>
<td>Criterion-referenced Tests</td>
</tr>
<tr>
<td>10: 11/11/13</td>
<td>C&amp;A 13</td>
<td><strong>Factor Analysis</strong></td>
</tr>
<tr>
<td>11: 11/18/13</td>
<td>C&amp;A 14</td>
<td>Item Analysis</td>
</tr>
<tr>
<td>12: 11/25/13</td>
<td>C&amp;A 15</td>
<td>Item Response Theory</td>
</tr>
<tr>
<td>13: 12/2/13</td>
<td>C&amp;A 12,16,20</td>
<td>Group Difference Testing (Bias) &amp; Equating</td>
</tr>
<tr>
<td>14: 12/9/2013</td>
<td></td>
<td>In Class Final Exam 6:00-8:00 PM (Comprehensive)</td>
</tr>
</tbody>
</table>
Selected Bibliography


