Course Syllabus

SCMS 8540-001 - Multivariate Analysis for Business Research
Spring Semester, 2016
3.0 Credit Hours
(Last updated: 1/11/2016)

Instructor: Dan L. Sherrell, Ph.D.
Professor of Marketing

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E-mail: dsherrll@memphis.edu
Office: Fogelman Executive Center: room #150
URL: https://umdrive.memphis.edu/dsherrll/www
Class: 1:00 – 4:00pm, Thursday, FCBE 268

Office Hours: 3:00-6:00pm; Tuesday
10:00 – 11:00am; Wednesday
9:00 – 11:00am; Thursday
Other times by appointment

Course Overview:

The conduct of scientific research in the business disciplines requires data analysis tasks covering a wide variety of circumstances. Many of the available multivariate techniques are useful tools for completing these analysis tasks. The primary objective of this course is to provide Ph.D. students with a survey of the available relevant multivariate analysis techniques which may be applied to solve business research problems. The course is designed to give students the opportunity to apply these techniques to data analysis problems to gain hands-on experience in their use. The coverage of techniques in this course includes factor analysis; multivariate regression; multiple discriminant analysis; logistic regression; MANOVA; and structural equation modeling.

Pre-Requisites/Co-Requisites:

SCMS 8530 or equivalent
**Required Texts (and Related Materials):**


There will be a set of reading materials assigned for discussion on a variety of topics relevant to the application of major multivariate techniques. The assigned materials will consist of articles from the relevant research literature and the appropriate chapters from the text. The course instruction pedagogy is built around a seminar format. Class discussion and analysis are the primary vehicles through which meaning and understanding of the assigned topics will be developed. This approach puts the burden of preparation on the student to become familiar with the material to be discussed prior to the class meeting for discussion of a specific topic.

**Location of Course Materials:**

The course syllabus and lecture notes/slides will be made available through the University elearn course management system at: [http://elearn.memphis.edu](http://elearn.memphis.edu). The assigned reading material will be available on the University UMdrive site at:


**Course Objectives:**

Upon completion of this course, students:

a. Should have a basic understanding of the purpose, assumptions, and output of the multivariate techniques of factor analysis; multiple regression; multiple discriminant analysis; logistical regression; MANOVA; and structural equation analysis.

b. Should have a basic understanding of how to apply each of the techniques to solve data analysis problems

c. Can demonstrate their ability to integrate and utilize this knowledge to develop and produce a research paper describing the initial development and testing of a multi-item scale to measure a conceptually-defined latent construct of their own choosing.

**Fogelman College: Learning Outcomes for Your Degree**

This course is designed to help you to meet the overall learning objectives for the Ph.D. degree offered by the Fogelman College. You should take the time to become familiar with the overall learning objectives as a student in the Ph.D. program: [http://www.fcbeassessment.net/LearningOutcomes/PhDDegreeLearningOutcomes.pdf](http://www.fcbeassessment.net/LearningOutcomes/PhDDegreeLearningOutcomes.pdf)

**Course Methodology**

The content covered in the course will be delivered through a variety of activities: class discussion; lecture; application activities; and class demonstrations. Student participation is required in each of these activities to provide sufficient opportunities for learning.
Professor’s Expectations:

In general, you should assist the instructor in creating a positive, supportive environment for learning by staying engaged in the course and actively participating in all class discussions.

Student’s Expectations:

In my role as your instructor, there are certain things you can expect from me including: well-organized and engaging learning experience, response to emails within two (2) business days, and feedback on all work submitted within 7-10 calendar days.

Grading and Evaluation Criteria

Each student’s performance in this course will be evaluated on the basis of: a) two exams covering the assigned text material; b) development & analysis of three analytical exercises using assigned data sets; c) an individual scale development research project; and d) class participation. Questions for the two exams will be drawn from the assigned reading materials and class discussions over the assigned topics.

Exams

The two exams will be composed of broad-scope discussion/essay questions of the type typically included on Ph.D. comprehensive exams, as well as applications-type questions covering the techniques discussed in class. See the course schedule for the material assigned to be covered for each exam.

Analysis Exercises

Students will be given a series of data sets and asked to design, conduct and report on the findings from an analysis of each of those data sets. Each data set will be accompanied by a research question that students will be asked to address. Using the analysis procedures available in SPSS, each student will be responsible for:

a. Developing specific hypotheses to be tested that address the assigned research question;
   b. Editing and analyzing the data set to test the stated hypotheses; and
   c. Writing a brief (i.e., 10 pg. maximum) descriptive report summarizing the results of that analysis.

The reports summarizing the results of each analysis should be professional in appearance and submitted in class on the assigned dates shown in the course schedule (i.e., Ex. I-2/11; Ex. II-3/17; and Ex. III-4/21).
Each report will be judged on:

a. The effectiveness of the hypotheses in addressing the research question;
b. The thoroughness of the data analysis conducted to address the stated research hypotheses;
c. The quality of the data analysis used to test the research hypotheses (i.e., validation of analysis technique assumptions; measures taken to address problems; etc.); and
d. The quality of the research report description in reporting the results of the analysis.

Scale Development Project

Each student will be asked to:

a. Choose a latent (i.e., unobservable) construct of interest to them,
b. Develop a conceptual definition supported by the relevant research literature, and
c. Develop and test a multi-item scale to measure the operationalized latent construct.

The scale development process used in the project (at a minimum) should encompass construct definition; item generation; scale item purification; and pilot testing to assess scale psychometric quality and scale nomological validity.

A prospectus report containing a description of the chosen construct and its conceptual definition based on the relevant research literature, as well as a detailed outline of the planned scale development process (with a timeline) should be developed and turned during class on 3/24/2016 (see the course schedule). Students will be responsible for developing a presentation via powerpoint slides to describe their project results to be made in class on 4/21/2016 (see schedule). Finally, the completed scale development paper should be turned electronically no later than 3:00pm on Thursday, 5/05/2016 during the final exam period (see schedule).

The written scale development report should be professional in appearance and of sufficient length to adequately describe the scale development activities undertaken by the student. Students will be responsible for acquiring a number of respondents sufficient to assess the psychometric and nomological properties of their new scale. The use of convenience sample designs for the purposes of scale purification and assessment is acceptable, as long as the appropriate limitations of this tactic are recognized in the Scale Project paper. The scale developed for this research project must be original to the student and not a revision of a previously published scale.

Class Participation

Students will be expected to come to class fully prepared to discuss the assigned topics for that particular meeting.
List of Formal Assessed Activities

The following grading system will be used:

<table>
<thead>
<tr>
<th>Course Component</th>
<th>Grade Pct.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam I</td>
<td>15%</td>
</tr>
<tr>
<td>Exam II</td>
<td>15%</td>
</tr>
<tr>
<td>Analysis Exercise I</td>
<td>10%</td>
</tr>
<tr>
<td>Analysis Exercise II</td>
<td>10%</td>
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<tr>
<td>Analysis Exercise III</td>
<td>10%</td>
</tr>
<tr>
<td>Scale Development project prospectus</td>
<td>10%</td>
</tr>
<tr>
<td>Scale Development paper &amp; presentation</td>
<td>25%</td>
</tr>
<tr>
<td>Class participation</td>
<td>5%</td>
</tr>
</tbody>
</table>

| Total:                                               | 100%       |

Final Course Grades
The + / - grading system will be used in this class.

<table>
<thead>
<tr>
<th>Point Range</th>
<th>Grade</th>
<th>Point Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>97 – 100 pts.</td>
<td>A+</td>
<td>74 – 76 pts.</td>
<td>C</td>
</tr>
<tr>
<td>94 – 96 pts.</td>
<td>A</td>
<td>70 – 73 pts.</td>
<td>C-</td>
</tr>
<tr>
<td>87 – 89 pts.</td>
<td>B+</td>
<td>64 – 66 pts.</td>
<td>D</td>
</tr>
<tr>
<td>84 – 86 pts.</td>
<td>B</td>
<td>60 – 63 pts.</td>
<td>D-</td>
</tr>
<tr>
<td>80 – 83 pts.</td>
<td>B-</td>
<td>Below 60 pts.</td>
<td>F</td>
</tr>
<tr>
<td>77 – 79 pts.</td>
<td>C+</td>
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### Schedule of Activities

**SCMS 8540 – Multivariate Analysis for Business Research**  
Course Schedule  
Spring 2016

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/21</td>
<td>Introduction</td>
<td>Course syllabus</td>
</tr>
<tr>
<td>2</td>
<td>1/28</td>
<td>Data Editing</td>
<td>Ch.1, 2 + readings; Ex. I assigned</td>
</tr>
<tr>
<td>3</td>
<td>2/04</td>
<td>Factor analysis</td>
<td>Ch.3; + readings</td>
</tr>
<tr>
<td>4</td>
<td>2/11</td>
<td>Multiple Regression</td>
<td>Ch. 4 + readings</td>
</tr>
<tr>
<td>5</td>
<td>2/18</td>
<td>Multiple Regression: Interactions &amp; dummy variables</td>
<td>Ch. 4 + readings; Ex. II assigned</td>
</tr>
<tr>
<td>6</td>
<td>2/25</td>
<td>Discriminant analysis/Logit Regression</td>
<td>Ch.5, 6 + readings,</td>
</tr>
<tr>
<td>7</td>
<td>3/03</td>
<td>Exam I (ch. 1-6 + assigned readings)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>3/10</td>
<td>Spring Break</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>3/17</td>
<td>MANOVA</td>
<td>Ch.7 + readings; Ex. II due</td>
</tr>
<tr>
<td>10</td>
<td>3/24</td>
<td>MANOVA</td>
<td>Ch.7 + readings; Scale paper prospectus due</td>
</tr>
<tr>
<td>11</td>
<td>3/31</td>
<td>Structural Equation Models: Basics + CFA</td>
<td>Ch.12, 13 + readings; Ex. III assigned</td>
</tr>
<tr>
<td>12</td>
<td>4/07</td>
<td>Structural Equation Models: CFA + Model testing</td>
<td>Ch.14,15 + readings</td>
</tr>
<tr>
<td>13</td>
<td>4/14</td>
<td>Exam II (Ch. 7, 12-15 + assigned readings)</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>4/21</td>
<td>Scale Development paper presentation</td>
<td>Ex. III due</td>
</tr>
<tr>
<td>15</td>
<td>5/05</td>
<td>Final Exam – Scale Development paper due</td>
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**Reading List**  
Note: Readings are available as .pdf files on:  
[https://umdrive.memphis.edu/dsherrill/public/SCMS8540](https://umdrive.memphis.edu/dsherrill/public/SCMS8540)

1/21 – Class 1  
Introduction

1/28 – Class 2  
Data Editing  
NHT, Effect Size, and Statistical Power


2/04 – Class 3
Scale Construction


2/11 & 2/18 - Class 4 & 5
Regression Topics


Mediation and Moderation in Model Testing


2/25 – Class 6
**Discriminant Analysis / Logit Regression**

3/03 – Class 7
**Exam I (ch. 1-6 + readings)**

3/10 – Class 8
**ANOVA & MANOVA**

3/17 – Spring Break

3/24 – Class 10
**Interactions in ANOVA & MANOVA**


3/31 – Class 11
Structural Equation Model (SEM) - Basics & CFA


4/07 – Class 12
Structural Equation Models – CFA & Structural Model Testing


4/14 – Class 13
Exam II (Ch. 7, 12-15 + readings)

4/21 – Class 14
Scale Development Project presentations

5/05 – Final Exam Period
Scale paper due electronically by 3:00pm
Final Exam Schedule

The final experience will consist of each student submitting a paper describing their activities and results from designing and testing a multi-item scale for measuring a latent construct of their choice. The final exam activity for this class will be scheduled according to the Registrar’s academic calendar website.

Course Policies

E-MAIL:

All students are required to maintain and access their University of Memphis (@memphis.edu) email account. You will receive all official course correspondence at this email account. Any inability to receive incoming mail in a timely fashion (e.g., not regularly checking your email, having a “full mailbox” condition, etc.) is the student’s responsibility.

Attendance:

Success in mastering the content covered in this course is based on discussion and understanding of the concepts covered. This course requires active participation to master its content. Consequently, attendance is required. You are expected to stay active and engaged throughout the academic term and keep up with the schedule of activities. Your full engagement in the class begins on the first day of the semester and should be maintained until the last assignment is submitted.

Adding / Dropping:

If you have questions about adding or dropping classes, please refer to this page on the Registrar’s website.

Academic Integrity:

The University of Memphis has clear codes regarding cheating and classroom misconduct. If interested, you may refer to the Student Handbook section on academic misconduct for a discussion of these codes. Note that using a “Solutions Manual” is considered cheating. Should your professor have evidence that using a “Solutions Manual” has occurred, he/she may take steps as described on the campus’ Office of Student Conduct website. If you have any questions about academic integrity or plagiarism, you are strongly encouraged to review the Fogelman College’s Website on Academic Integrity.

Participation:

To be successful in this course as a student, you must stay active and involved throughout the entire semester. Students are expected participate in all interactive aspects of the course.
Classroom Behavior:

All participants in the course should be considerate of the other course participants and treat them (as well as their opinions) with respect. The class will operate under the assumption that any and all feedback offered is positive in nature and that the intentions of the person(s) providing feedback are strictly honorable. Insensitivity in this area will not be tolerated. If you have any questions about online communication, you should review the Fogelman College’s Netiquette website.

Late Assignments:

Assignments and projects may be submitted anytime up to and including the date due. Please review all information in this syllabus and related “Course Activity Summary / Schedule” for all due dates for formally assessed work. If your work is not submitted on time, the instructor reserves the option to deduct up to 20% of the grade value for tardiness depending upon the circumstances and appropriate communication between the student and the instructor.

Extra Credit:

There is no extra credit offered in this course. Your final grade will be computed based on your work on the activities previously described in this syllabus.

Reporting Illness or Absence:

Due dates and deadlines have been established for each graded assignment. In this course, deadlines are taken very seriously. Please do not wait until the last day to submit assignments. If an emergency should arise, it is the student’s responsibility to contact the instructor prior to the deadline to discuss the matter. A deadline extension will be considered only if all of the following conditions are met: (1) Extreme emergency and (2) Instructor contacted prior to the due date.

Inclement Weather:

In the event that inclement weather requires the cancellation of classes at The University of Memphis, local radio and television media will be immediately notified. Additionally, The University of Memphis has established an Inclement Weather Hotline at 678-0888 as well as TigerText, an emergency alert text messaging service to students, faculty and staff. This optional service is used in the event of an on-campus emergency, an unscheduled university closing, or a delay or cancellation of classes due to, for instance, inclement weather. Click Here for information on TigerText.

Syllabus Changes:

The instructor reserves the right to make changes as necessary to this syllabus. If changes are necessitated during the term of the course, the instructor will immediately notify students of such changes both by individual email communication and posting both notification and nature of change(s) on the course bulletin board.
Student Services

Please access the FCBE Student Services page for information about:

- Students with Disabilities
- Tutoring and other Academic Assistance
- Advising Services for Fogelman Students
- Technical Assistance