Wayne State University  
Division of Theoretical and Behavioral Foundations  
Educational Evaluation and Research

Course Number: EER 8992  
Course Title: Research and Experimental Design  
Credit: 3 hours  
Section Number: 901  
Semester & Year: Fall 2013  
Location: 629 Oakland Center  
Class Day and Time: Thursday: 4:30 – 7:15 PM

Instructor: Dr. Michael Lance  
Office Address: Main Office, Oakland Center  
Office Hours: Thursday: 7:15 – 8:15 PM (by appointment only)

e-mail: michael.lance@gmail.com

Secretary: Sheri Martini: 577-1614  
sheri.martini@wayne.edu

Fax Number: 577-5235

Course Description:
Design of empirical research for students possessing basic knowledge of statistics. Topics include hypothesis construction, sampling theory, experimental and quasi-experimental designs, selection of statistical procedures, and construction of data gathering instruments.

Course Outcomes:
It is the purpose of this course to provide experiences that will enable the student to:

1. Discuss the scientific approach as applied in the behavioral sciences, as well as the differences, advantages, and limitations between the scientific method and other methods of knowing.
2. Recognize, define, and be familiar with the distinctions between a researchable problem, a problem statement, and a research hypothesis.
3. Define constructs, concept, and variables operationally and constitutively, define the dependent and independent variables, and determine the quantitative and/or qualitative characteristics of variables.
4. Evaluate the ethical considerations of a research design.
5. Be familiar with the five components of a research report and be able to write a research proposal.
6. Discuss the characteristics of a research design and critique research designs in the literature.
7. Identify threats to internal, external, statistical conclusion, construct, content, and criterion validity, and be able to discuss the methods used to control these threats.
8. Discuss random selection, random assignment, and the relationship between randomization and threats to validity.
9. Compare and contrast experimental designs, quasi-experimental designs, non-experimental research, and other types of research.
10. Apply basic principles of classical measurement theory to research design.
11. Interpret reliability and validity in relationship to measurement of variables.
12. Define and select a variety of methods of observation and data collection in developing a research proposal and evaluating research in the literature.
13. Select appropriate statistical approaches for data analysis, including hypothesis testing, descriptive statistics, measures of relations, analysis of differences, analysis of variance, and multivariate analysis.
14. Determine required sample size(s) and power by correctly identifying the appropriate alpha level and effect size.

Required Textbook:
Experimental and Quasi-Experimental Designs for Generalized Causal Inference by William Shadish, Thomas Cook, and Donald Campbell
2nd Edition
ISBN 10: 0395615569

Optional:
Statistical Power Analysis for the Behavioral Sciences by Jacob Cohen
2nd Edition
ISBN 10: 0805802835

Assignments - Always be sure to identify each item per the rubric.

Problem Statement: The problem statement will be a 2 - 3 page paper that will describe the research problem, state the research question(s), and define the independent and dependent variables.

Research Proposal - Chapter I: Chapter I will be at least 15 pages. This is a scientific paper and must be in APA format. There must be a minimum of 10 references from research-based articles from refereed journals. It must include citations to support the rationale, need for the study, background information given, and definitions. It must include the component parts of an introduction to a scientific report. Details will be presented in class.

Research Proposal - Chapter III: Chapter III will be approximately 10 - 12 pages. Chapter III is the methodology. It must be written in APA format. Citations must be used to support any statements as necessary. It must include the component parts of research methodology, which will be presented in class.
**Assignments and point values**

Research Proposal - Problem Statement 20 points  
Research Proposal - Chapter I 40 points  
Research Proposal - Chapter III 40 points  
100 points

Late papers lose 1 point for every 12 hours late (and half a point for every 6 such hours) unless the lateness is somehow documented (i.e. doctor’s note). If documented, late papers lose 1 point for every 24 hours (in any case, prorated for every fraction thereof).

**Grading Scale**

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<th>Grade</th>
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<td>A</td>
<td>93 - 100</td>
<td>B+</td>
<td>87 - 89</td>
<td>C+</td>
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<td>A-</td>
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<td>B</td>
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<td>80 - 82</td>
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**Class Policies**

Attendance is expected for the entire semester, and for the full class session. Please notify me in advance if you are unable to attend, expect to be late or have to leave early.

**Incomplete Grade**

To be completed within one year as per University Requirements.

**Plagiarism:**

Plagiarism includes copying material (any more than 5 consecutive words) from outside texts or presenting outside information as if it were your own by not crediting authors through citations. **It can be deliberate or unintended.** If you're in doubt about the use of a source, cite it. Students caught plagiarizing information from other sources will receive a **failing grade in the course.** University policy states that students can be subject to multiple sanctions, from **reprimand to expulsion as a consequence of academic dishonesty.** To enforce this policy, all outside references must be submitted with assignments. **Plagiarism detection software will be used to detect and identify sources of plagiarism.**

**Enrollment/ Withdrawal Policy**

Beginning in Fall 2011, students must add classes no later than the end of the first week of classes. This includes online classes. Students may continue to drop classes (with full tuition cancellation) through the first two weeks of the term.
Students who withdraw from a course after the end of the 4th week of class will receive a grade of WP, WF, or WN.

- WP will be awarded if the student is passing the course (based on work due to date) at the time the withdrawal is requested
- WF will be awarded if the student is failing the course (based on work due to date) at the time the withdrawal is requested
- WN will be awarded if no materials have been submitted, and so there is no basis for a grade

Students must submit their withdrawal request on-line through Pipeline. The faculty member must approve the withdrawal request before it becomes final, and students should continue to attend class until they receive notification via email that the withdrawal has been approved. Beginning in Fall 2011, the last day to withdraw will be at the end of the 10th full week of classes. The withdrawal date for courses longer or shorter than the full 15-week terms will be adjusted proportionately.

**Attention Students with Disabilities:**

If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services’ mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.

**Religious Observance Policy:**

Because of the extraordinary variety of religious affiliations represented in the University student body and staff, the Wayne State University calendar makes no provision for religious holidays. It is University policy, however, to respect the faith and religious obligations of the individual. Students who find that their classes or examinations involve conflicts with their religious observances are expected to notify their instructors well in advance so that alternative arrangements as suitable as possible may be worked out.
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<tr>
<th>Class</th>
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<th>Topic</th>
<th>Readings</th>
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<tr>
<td>1</td>
<td>1/9</td>
<td>Introduction</td>
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<tr>
<td>2</td>
<td>1/16</td>
<td>Experiments and Causal Inferences</td>
<td>SC&amp;C Ch. 1</td>
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<td>3</td>
<td>1/23</td>
<td>Statistical Conclusion &amp; Internal Validity</td>
<td>SC&amp;C Ch. 2</td>
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<td>4</td>
<td>1/30</td>
<td>Construct &amp; External Validity Practice: Counterfactuals, Constructs, Measures</td>
<td>SC&amp;C Ch. 3</td>
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<td>5</td>
<td>2/6</td>
<td>Randomized Experiments</td>
<td>SC&amp;C Ch. 8 Problem Statement Due</td>
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<td>6</td>
<td>2/13</td>
<td>Quasi-Experimental Designs</td>
<td>SC&amp;C Ch. 4 &amp; 5</td>
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<td>7</td>
<td>2/20</td>
<td>Regression Discontinuity Designs</td>
<td>SC&amp;C Ch. 7</td>
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<td>8</td>
<td>2/27</td>
<td>Review, Applications, and Examples</td>
<td>TBA</td>
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<td>9</td>
<td>3/6</td>
<td>Practical Problems &amp; Ethical Considerations</td>
<td>SC&amp;C Ch. 9 &amp; 10</td>
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<td>3/13</td>
<td>Spring Break (No Class)</td>
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<tr>
<td>10</td>
<td>3/20</td>
<td>Survey Construction, Scales, Data Files</td>
<td>Ch. 1 Due</td>
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<td>11</td>
<td>3/27</td>
<td>Instrument Measurement Reliability, Validity</td>
<td>TBA</td>
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<td>12</td>
<td>4/3</td>
<td>Statistical hypotheses, selection of statistical tests, underlying assumptions</td>
<td>Review SC&amp;C Ch. 2, Lecture 2 (SCV only) Study your statistical procedure</td>
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<td>13</td>
<td>4/10</td>
<td>Statistics continued: Determining Power and/or Sample Size</td>
<td>Study your statistical procedure</td>
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<td>4/17</td>
<td>Human Investigations Committee &amp; IRB</td>
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<td>4/24</td>
<td><strong>No Class – Final Exam Day</strong></td>
<td>Ch. 3 Due</td>
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