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We develop educational leaders who create tomorrow’s opportunities.

MISSION STATEMENT
Our mission is to prepare competent and committed professionals who will make positive differences for children, young adults, and others in schools.

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY
EPS 624: COMPUTER STATISTICS
SPRING 2009 – THURSDAYS 1:15 P.M. TO 3:45 P.M.

GENERAL INFORMATION
Instructor: Robert A. Horn, Ph.D.
Office: Eastburn Education Building – Room 206-J
Phone: (928) 523-0545
E-mail: (preferred method of contact) Robert.Horn@nau.edu
Office hours: Tuesdays: 12:30 p.m. to 3:00 p.m.
Thursdays: 11:30 a.m. to 1:00 p.m.
Other times by appointment
Credit Hours: 3

COURSE PREREQUISITES
EPS 525 (Introduction to Statistics) – It is strongly recommended that you also have taken EPS 625 (Intermediate Statistics). Additionally, it is required that you take EPS 725 (Multivariate Statistics) concurrently with this class.

COURSE DESCRIPTION
This course focuses on computer applications of descriptive and inferential statistics including practice to assist in preparing research projects. Topics covered will include (a) setting up and retrieving SPSS files, (b) screening ungrouped and grouped data, (c) analyzing underlying assumptions, (d) conducting analyses for various descriptive, univariate, bivariate, and multivariate statistics, and (e) applying this entire process independently to a data set answering research questions. Students will gain a better understanding of various SPSS functions and applications. Additionally, students will learn how to create APA approved tables. The primary focus of this course is to familiarize students with the creation of the various statistical application outputs that will be interpreted in EPS 725 Multivariate Statistics, as students will prepare the data for interpretation in that class.

COURSE WEBSITE
http://oak.ucc.nau.edu/rh232/courses/EPS624
Students are expected to visit the EPS 624 website on a regular basis (at least weekly) for course announcements, handouts, examples, and other important information pertaining to the class. Data sets used in this course will be made available on the website.

**Some handouts will be provided on the website that students will need to print and read prior to class as part of the course lecture and subsequently become part of the testable materials.**

**STUDENT LEARNING EXPECTATIONS / OUTCOMES FOR THIS COURSE**

1. Students will demonstrate competencies in setting up SPSS files, using and defining data, and retrieving SPSS files.
2. Students will demonstrate competencies in various SPSS applications that are presented throughout the course of the semester including the use of syntax commands.
3. Students will be able to interact between SPSS and other computer applications such as Microsoft Word.
4. Students will be able to screen ungrouped data for frequencies and histograms for initial screening of potential outliers.
5. Students will be able to replace missing values with the mean, plot for linearity and homoscedasticity, transform variables, detect multivariate outliers through regression, identify variables causing cases to be outliers, and analyze multicollinearity.
6. Students will be able to screen grouped data for frequencies and histograms, scatterplots and linearity, multivariate outliers and multicollinearity.
7. Students will demonstrate the ability to compute descriptive, univariate, and bivariate statistical analyses.
8. Students will demonstrate the ability to evaluate the underlying assumptions and compute the following multivariate statistical analyses (as mirrored in EPS 725):
   a. Data Screening
   b. Multiple Regression
   c. Canonical Correlation
   d. Multivariate Analysis of Covariance
   e. Logistic Regression
   f. Principal Components Analysis
   g. Confirmatory Factor Analysis
   h. Structural Equation Modeling
9. Students will be able to independently conduct a comprehensive analysis of a data set answering identified research questions.
10. Students will demonstrate competencies in creating various APA approved tables.


**Course Structure and Approach**

The intent of this class is not to provide the data interpretation for the statistical analyses that will be performed. This course is designed to mirror the EPS 725 Multivariate Statistics class, in that students will utilize SPSS to create the various data output files that are then interpreted in EPS 725. This course is designed primarily to provide students with hands-on opportunities to conduct the required statistical analyses. Throughout the semester, students will have a variety of opportunities to increase their knowledge of SPSS as well as other computer applications (e.g., Word and PowerPoint). The course goals and objectives will be accomplished through the use of brief lectures, guided problem solving, whole-group participation, small-group work, text readings, homework assignments, and working with the SPSS computer program and other Microsoft Office applications.

Statistics is challenging, yet can ultimately be a rewarding subject. The language of statistics is often new; however, an increased exposure will aid in your understanding and success in the class. One’s knowledge of statistics becomes a tool that they can use to interpret the results of research or to do research individually or collectively. Successful mastery of the subject matter of statistics does require regular attendance, text and handout reading (and re-reading), problem-solving, application of the material, and of course, study time. While the specific amount of time required to master the material will vary for each individual, you should expect to study a minimum of 2 hours out of class for every hour in class. For some students, more time may be required. Study time may also require students to spend time outside of the class (in the labs and/or other computer locations) with SPSS and other computer applications. Repetition is a key element to success. Expect to read the material more than once, as it may take multiple readings to better understand the information.

The material to be discussed and covered at the class meeting should be read (or, at a minimum, reviewed for definitions and context) before coming to class to allow active participation in the class and provide foundational knowledge of the topic area(s).

**Required and Recommended Materials**

It is required that students maintain a portfolio (at least 3 inches) for the several handouts and supplemental materials that will be provided. The portfolio is intended to contain material from both EPS 624 and EPS 725. These materials can be used to review for the scheduled examinations as well as provide a valuable reference for future research projects.

There is no better way to get a feel for statistics than to get one’s hands into the raw data and to actually perform the various analyses. This will require the use of statistical software such as SPSS (which we will be using in this class). Students are not required to purchase a copy of SPSS; however, options (and suggestions) on versions and formats will be provided.

You will also need a calculator for this course, as some applications may require hand calculations. FYI – there is a calculator on the lab computers which may be used. The calculator you use (if you choose to purchase one) should have the keyed functions to perform descriptive and inferential statistics. In other words, it should have the square root key and the squared key. There is no need to get an expensive, overly sophisticated calculator. Since the calculator will be a tool for the course, you will want one you can use (or learn to use) easily.
**WORKING TOGETHER**

Keep in mind that statistics is a tool course. It is something that you use to do research, or to interpret the results of research. As such, it is a means to an end rather than an end in itself. Acquiring skills with statistics and other applications can facilitate your other endeavors. Working with others provides an additional support system for getting help with things that you are not quite sure of or comfortable with initially. That is, we can learn a lot and re-enforce our knowledge from working with others.

**Do not hesitate or delay contacting me if you have questions and/or concerns regarding your progress in this class.**

**ATTENDANCE**

Research has directly linked a student’s performance with their attendance. Class attendance and participation, which cannot be duplicated in any other fashion, is considered an important element of the student’s development and training. Students are expected to attend all scheduled class meetings where there will be many opportunities to participate. Any student admitted to membership in the NAU community has freely accepted the obligation of class attendance; therefore, regular attendance at all classes for which the student is registered is the responsibility of the student. As such, class attendance and participation (e.g., discussions, activities, and assignments) are not only expected, but are required, and are extremely important for the successful completion of this course.

The **attendance policy** for this class is that more than two absences from scheduled class meetings will result in an automatic reduction of 35 points per subsequent absence (i.e., a third absence will reduce your total points for the class by 35 points, a fourth absence will reduce your total points for the class by 70 points, a fifth by 105 points, and so on). Therefore, monitor your absences carefully. Being tardy to class or leaving early from class (20 minutes or more) will be considered an absence (with the exception of exam days). Plan to arrive to class on time and not to leave class before the scheduled departure time. You are responsible for signing the attendance sheet each class period.

If excessive absences (including continual late arrivals or departures) occur, I reserve the right to notify the student’s advisor and to administratively drop the student from the class.

It is recognized that absences from class are sometimes necessary. However, “You are responsible for regularly attending all courses for which you are registered. Should an absence from class be unavoidable, you are responsible for reporting the reason to your instructors. In addition, you are responsible for making up any work you miss. Your instructors are under no obligation to make special arrangements for you if you are absent” (NAU Graduate Catalog, p. 23). Please notify the instructor (via email and/or voicemail) within a reasonable amount of time (ideally, prior to the absence) if extenuating circumstances require you to miss a class. Students are accountable for content, assignments, and announcements made during each class and should make arrangements to get the information whenever they are absent. Per university policy, the instructor does not provide extended tutoring for students who miss class. It is strongly suggested that if you miss a class, visit the course website, ask a fellow student to pick up any handouts for you, to take notes for you and/or meet with you prior to the next class to review the missed material.
Because of the amount of content covered, we cannot repeat full class content. As applicable, you will be responsible for conducting the required computer applications that you miss due to any absence(s).

**Course Assessment and Grading System**

Students will be assessed based on their performance on the two scheduled examinations; computer data analysis assignments (CDAAs), SPSS application assignments, the creation of APA approved tables, and the creation of an organized course portfolio.

**Course Material Expectations**

**As a graduate student,** my expectations of you are high, and as such, you are expected to keep up with all requirements of this class (including reading assigned chapters and handouts) and take adequate notes in preparing for examinations and assisting with the data analysis assignments. You are also expected to ask questions and seek clarification when needed – this can be (ideally) done in class, before or after class, during office hours, or via e-mail.

While I strongly encourage you to participate in the class discussions, there may be times when the direction of the discussion begins to go beyond the scope of this course. At which time I will ask that such a discussion continue outside of the scheduled class time so as to not add possible confusion to the required information. Supplemental materials will periodically be made available that will enhance your understanding.

**Examinations (100 points each)**

Each student will complete two examinations that will consist primarily of problem solution type questions and general SPSS output creation, and some multiple-choice, true-false, and short answer questions. Students will be allowed to use their EPS 725 text, EPS 624 class notes, and handouts for each examination. While the scheduled examinations are not comprehensive *per se*, the nature of statistics is cumulative, and as such will continue to build on prior information and require students to have a clear understanding of all aspects of the prior materials to be successful.

Students will not retain copies of any examination. Examinations will be reviewed in class and/or students can schedule an appointment to review any of their examinations.

In the event of an emergency (as determined by the instructor), a student may make-up a scheduled examination. As much advance notice as possible should be given (prior to the examination date). The make-up examination format will consist primarily of essay-type questions along with the standard examination format. Since examinations are typically reviewed the following class period from the scheduled examination date, make-up examinations should be completed as close to the original examination date as possible and must be completed prior to the next scheduled class meeting. The final examination must be taken prior to the end of the scheduled semester for a grade to be posted.
**COMPUTER DATA ANALYSIS ASSIGNMENTS (CDAA) (60 POINTS TOTAL)**

Each student will complete **twelve** computer data analysis assignments (worth 5 points each) that will involve the creation of output to be used for analyzing and interpreting databases that are provided by the instructor. The instructor will guide or assist the students in the use of the computer program for each assignment, with some requiring a higher level of independence. Students will use SPSS to complete the assignments.

**Note:** Data output interpretation of the assignments will be conducted in EPS 725 – Multivariate Statistics.

Students are responsible for ensuring that each computer data analysis assignment (CDAA) is completed as scheduled. Because of the pace of this class, class time will **not** be available to create prior CDAA's. Since each CDAA is awarded points, it is the responsibility of the student to demonstrate to the instructor their ability to conduct each of the CDAA's. In the event that a student misses a class, the demonstration of the CDAA **must** be conducted at a scheduled time (within one week of the original scheduled date) in order to receive one-half of the original points.

**SPSS APPLICATION ASSIGNMENTS (25 POINTS EACH)**

Each student will complete **two** SPSS application assignments that will involve demonstrating their ability to create a data file, conduct general statistical analyses, and create and alter graphs.

**APA TABLES ASSIGNMENTS (25 POINTS EACH)**

Each student will complete **two** APA tables assignments (which consist of more than one table) that will involve demonstrating their ability to create appropriate tables from a given set of output using APA guidelines.

All scheduled assignments (i.e., SPSS applications and APA tables) **must** be turned in on or before the scheduled due date – they will **not** be accepted late for full points. Assignments turned in late (by the next class meeting) will be graded at one-half the possible points. Assignments **WILL NOT** be accepted for grade after the following class meeting from their scheduled due date. All assignments **must** be turned in by the last day of the scheduled semester.

**COURSE PORTFOLIO (20 POINTS TOTAL)**

Each student will create and maintain a portfolio containing the various statistical analyses and applications covered throughout the semester. The intent here is for a student to create a reference tool that they will be able to utilize in their future research. Course portfolios will be reviewed on the final day of class. Students may check with the instructor throughout the semester to ensure that their portfolio follows the guidelines (which will be provided at the beginning of the semester).

The content for the course portfolio will incorporate information from both EPS 624 and ESP 725.
GRADING SYSTEM (BASED ON 380 TOTAL POSSIBLE POINTS)

The final course grade will be based on the total number of points earned during the semester. Students will be assigned a letter grade based on the following criteria:

- **A**: (90-100%) 342 – 380 points
- **B**: (80-89%) 304 – 341 points
- **C**: (70-79%) 266 – 303 points
- **D**: (60-69%) 228 – 265 points
- **F**: (59% and below) 227 points and below

**Note:** Excessive absences will result in a grade reduction of one letter grade.

**Course Policies (Notes and Reminders)**

- Students should read this syllabus in its entirety, as they are responsible for its content. Students should ask questions as necessary regarding this syllabus and/or the course.

- **ALL PAGERS, CELL PHONES, AND ELECTRONIC DEVICES (OTHER THAN THE APPROVED CALCULATORS) MUST BE TURNED OFF DURING CLASS – AND MUST BE PUT AWAY (i.e., OFF THE DESK TOP) ESPECIALLY DURING ANY TESTING.** I reserve the right to ask the student to leave class if this presents a concern. If you are expecting an emergency call during class, you must let the instructor know in advance, and excuse yourself from the room if the phone rings.

- **WHILE IN THE LAB (DURING SCHEDULED CLASS TIMES) STUDENTS ARE NOT TO USE THE COMPUTER FOR PERSONAL MATTERS (E.G., E-MAIL, SURFING, ETC.).** I reserve the right to ask the student(s) to leave class if such activity occurs.

- So that all students benefit from class activities, excessive talking and disruptive actions (especially non-course related) should be avoided. I reserve the right to ask the student(s) to leave class if such unnecessary distractions occur.

- The class will start and end on time. Many handouts will be provided at the beginning of the courses and not re-distributed until a break or after class. Please make every effort to **not** come in late and I will make every effort to **not** keep you late. If you must arrive late or leave early, please let me know in advance (via phone or email). As stated above, excessive tardiness or early departure will result in an absence. Also – **DO NOT** start packing up your belongings prior to being dismissed for the day.

- This course covers a lot of material in a relatively short period of time and moves rather quickly. In order to keep up and do well, you need to 1) attend and participate in all class meetings, 2) read and study the applicable reference chapters, 3) read and study all of the course handouts, 4) take and study lecture notes, 5) work with other students, and 6) visit with the instructor as needed.

- Students are expected to manage their official status in the class. That is, students who decide to drop (which will require them to also withdraw from EPS 725) from the class must officially withdraw – otherwise they will be subject to grading.

- While it is the intent of this syllabus to capture necessary aspects of this class, I reserve the right to amend and/or add necessary information as we progress through the semester.
**COURSE OUTLINE: TENTATIVE SCHEDULE OF TOPICS, ASSIGNMENTS, AND EXAMINATIONS**

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC*</th>
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<tbody>
<tr>
<td>January 15</td>
<td>Introduction and Overview of Course</td>
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<td>Univariate Data Screening CDAA</td>
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<td>January 22</td>
<td>Overview of SPSS and the Virtual Lab</td>
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<td>Multivariate Data Screening CDAA</td>
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<td>January 29</td>
<td>Sequential Multiple Regression Analysis CDAA</td>
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<td>February 5</td>
<td>Exploring SPSS Functions and Applications</td>
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<td>Stepwise Multiple Regression Analysis CDAA</td>
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<td>February 12</td>
<td>Creating APA Tables – Posters – and Presentations</td>
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<td>Canonical Correlation Analysis CDAA – 1</td>
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<td>February 19</td>
<td>Creating APA Tables – Posters – and Presentations, continued</td>
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<td></td>
<td>Canonical Correlation Analysis CDAA – 2</td>
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<td>February 26</td>
<td>Multivariate Analysis of Covariance CDAA</td>
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<td>March 5</td>
<td><strong>EXAMINATION NO. 1</strong></td>
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<td>March 12</td>
<td><strong>APA TABLES NO. 1 DUE</strong></td>
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<td>March 19</td>
<td><strong>SPRING BREAK – NO CLASS HELD</strong></td>
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<tr>
<td>March 26</td>
<td>Exploring more SPSS Functions and Applications</td>
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<td>Creating more APA Tables</td>
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<td>April 2</td>
<td><strong>SPSS APPLICATION NO. 1 DUE</strong></td>
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<td>Principal Components Analysis CDAA</td>
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<td>April 9</td>
<td>Confirmatory Factor Analysis CDAA</td>
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<td>April 16</td>
<td>Structural Equation Modeling CDAA – 1</td>
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<td>April 23</td>
<td>Catch-up and Review (WPA Conference)</td>
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<td>April 30</td>
<td>Structural Equation Modeling CDAA – 2</td>
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<td>May 7</td>
<td><strong>FINAL EXAMINATION</strong></td>
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<td><strong>SPSS APPLICATION NO. 2 DUE</strong></td>
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<td><strong>APA TABLES NO. 2 DUE</strong></td>
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<td><strong>COURSE PORTFOLIO DUE</strong></td>
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*As time permits... additional SPSS and APA information will be provided during class time

**NOTE:** This schedule is subject to change to maintain consistency with EPS 725.
In the event there is a need to evacuate the building if the fire alarm is sounded, students are to leave in an orderly fashion. If the fire alarm is sounded during an examination, students are to leave their exam face down on the desk and exit the building.

It is very important for all students who do not use their Dana email accounts to forward their email from their NAU account to their primary email account. This will allow the student to receive important university information as well as course information. It is very easy to forward email through the “manage your email accounts” section located on the front page of I.T.S at http://www4.nau.edu/its/home/

IMPORTANT LINKS

All students are expected to review and be familiar with the information contained at each of the following links as well as those identified in the NAU Academic Policy Statements.

ACADEMIC POLICIES (INCLUDING ATTENDANCE AND ACADEMIC INTEGRITY)  
http://www4.nau.edu/stulife/StudentHandbook/AcademicPolicies.htm

STATEMENT ON PLAGIARISM AND CHEATING  
http://www4.nau.edu/stulife/StudentHandbook/Appendix_G_AcademicDishonesty.htm

STUDENT HANDBOOK  
http://www4.nau.edu/stulife/StudentHandbook/TableofContents.htm

STUDENT CODE OF CONDUCT  
www.nau.edu/~stulife/code

SAFE ENVIRONMENT POLICY

NAU’s Safe Working and Learning Environment Policy seeks to prohibit discrimination and to promote the safety of all individuals within the University. The goal of this policy is to prevent the occurrence of discrimination on the basis of sex, race, color, age, national origin, religion, sexual orientation, disability, or veteran status, and to prevent sexual harassment, sexual assault or retaliation by anyone at this university.

You may obtain a copy of this policy from the college dean’s office. If you have concerns related to this policy, it is important that you contact the departmental chair, dean’s office, the Office of Student Life (928-523-5181), the Academic Ombudsperson (928-523-9368), or NAU’s Office of Affirmative Action (928-523-3312).

STUDENTS WITH DISABILITIES

If you have a documented disability, you can arrange for accommodations by contacting the office of Disability Support Services (DSS) at 928-523-8773 (voice), 928-523-6906 (TTY). In order for your individual needs to be met, you are required to provide DSS with disability related documentation and are encouraged to provide it at least eight weeks prior to the time you wish to receive accommodations. You must register with DSS each semester you are enrolled at NAU and wish to use accommodations.

Faculty are not authorized to provide a student with disability related accommodations without prior approval from DSS. Students who have registered with DSS are encouraged to notify their instructors a minimum of two weeks in advance to ensure accommodations. Otherwise, the provision of accommodations may be delayed. Concerns or questions regarding disability related accommodations can be brought to the attention of DSS or the Affirmative Action Office.

INSTITUTIONAL REVIEW BOARD

Any study involving observation of or interaction with human subjects that originates at NAU—including a course project, report, or research paper—must be reviewed and approved by the Institutional Review Board (IRB) for the protection of human subjects in research and research-related activities. A copy of the IRB Policy and Procedures Manual is available in each department’s administrative office and each college dean’s office. If you have questions, contact Office of Grant and Contract Services.
The IRB meets once each month. Proposals must be submitted for review at least fifteen working days before the monthly meeting. You should consult with your course instructor early in the course to ascertain if your project needs to be reviewed by the IRB and/or to secure information or appropriate forms and procedures for the IRB review. Your instructor and department chair or college dean must sign the application for approval by the IRB. The IRB categorizes projects into three levels depending on the nature of the project: exempt from further review, expedited review, or full board review. If the IRB certifies that a project is exempt from further review, you need not resubmit the project for continuing IRB review as long as there are no modifications in the exempted procedures.

ACADEMIC INTEGRITY

The university takes an extremely serious view of violations of academic integrity. As members of the academic community, NAU’s administration, faculty, staff and students are dedicated to promoting an atmosphere of honesty and are committed to maintaining the academic integrity essential to the education process. Inherent in this commitment is the belief that academic dishonesty in all forms violates the basic principles of integrity and impedes learning. Students are therefore responsible for conducting themselves in an academically honest manner.

Individual students and faculty members are responsible for identifying instances of academic dishonesty. Faculty members then recommend penalties to the department chair or college dean in keeping with the severity of the violation. The complete policy on academic integrity is in Appendix F of NAU’s Student Handbook.

ACADEMIC CONTACT HOUR POLICY

The Arizona Board of Regents Academic Contact Hour Policy (ABOR Handbook, 2-206, Academic Credit) states: “an hour of work is the equivalent of 50 minutes of class time...at least 15 contact hours or recitation, lecture, discussion, testing or evaluation, seminar, or colloquium as well as a minimum of 30 hours of student homework is required for each unit of credit.” *The reasonable interpretation of this policy is that for every credit hour, a student should expect, on average, to do a minimum of two additional hours of work per week; e.g., preparation, homework, studying.*

CLASSROOM MANAGEMENT STATEMENT

Membership in the academic community places a special obligation on all members to preserve an atmosphere conducive to a safe and positive learning environment. Part of that obligation implies the responsibility of each member of the NAU community to maintain an environment in which the behavior of any individual is not disruptive.

It is the responsibility of each student to behave in a manner that does not interrupt nor disrupt the delivery of education by faculty members or receipt of education by students, within or outside the classroom. The determination of whether such interruption/disruption has occurred must be made by the faculty member at the time the behavior occurs. It becomes the responsibility of the individual faculty member to maintain and enforce the standards of behavior acceptable to preserving an atmosphere for teaching and learning in accordance with University regulations and the course syllabus.

At a minimum, a student will be warned if his/her behavior is considered by the faculty member to be disruptive. Serious disruptions, as determined by the faculty member, may result in immediate removal of the student from the instructional environment. Significant and/or continued violations of this policy may result in an administrative withdrawal of the student from the class. Additional responses by the faculty member to disruptive behavior may include a range of actions from discussing the behavior with the student to referral to the appropriate academic unit and/or the Office of Student Life for administrative review in an effort to implement corrective action up to and including suspension or expulsion from the University.