



Spring 2013

# EDUC 8171

## Predictive Designs & Analyses

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**Classroom:**  
**Class Time:**  
**Office hours:** Tues 3:45-4:45pm  
Thur 3:45-4:45pm  
(begin Jan 15 and end Apr 25)  
(walk-in, first-come, first-serve basis)

## COURSE INFO

### **Prerequisites:**

1. EDUC 298 (6116 - Introduction to Educational Statistics) or equivalent, or instructor's permission.
2. EDUC 302 (8120 - Group Comparisons) or equivalent, or instructor's permission. This course builds on topics which were introduced in EDUC 298 (6116) and EDUC 302 (8120) including: descriptive statistics, graphs, basic sampling and hypothesis testing, two-group mean comparison, simple analysis of variance (ANOVA), multiple comparison procedures, factorial ANOVA designs, and repeated measures. Note that students who have not had the necessary prerequisite coursework should not take EDUC 8171.

### **Course Description:**

EDUC 8171 is designed to be an advanced course in quantitative research methodology. We will work on the skills to enable you to become an informed consumer of the research literature, as well as prepare you to be a competent researcher. This class will concentrate on the use of regression as a statistical test. Specifically, we will cover simple linear regression, multiple regression, and logistic regression. We will examine the use of both continuous and categorical independent variables, and interactions between them. Statistical tests will be calculated 'by hand' as well as with SPSS. These statistical procedures will be taught within the context of the relevant research designs. We will work to develop the appropriate vocabulary to communicate the research results, and work to hone the skills needed to critically evaluate the research literature.

### **Research Methods Lab Assistant**

**Who:** Megan Shaine  
**Email:** [edreslab@gwu.edu](mailto:edreslab@gwu.edu)  
**Phone:** 202-994-3174  
**Office Hrs:**

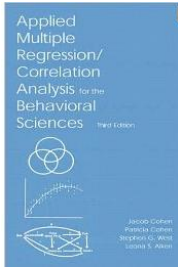
Appointments during these times are STRONGLY recommended. The Lab Assistant cannot guarantee availability without an appointment.

### **What's in this Syllabus?**

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# COURSE MATERIALS

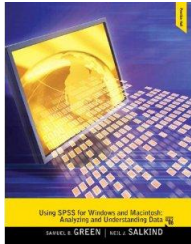
## Required Textbooks:



1. Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. (3rd ed.). New Jersey: Lawrence.

**(e-copy available for free from the Gelman Library website)**

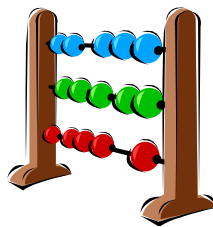
## Optional Textbooks:



1. Green, S.B., & Salkind, N.J. (2010). *Using SPSS for Windows and Macintosh: Analyzing and understanding data*. (6th ed.). Upper Saddle River, NJ: Prentice.
2. American Psychological Association (2009). *Publication Manual of the American Psychological Association*. (6th ed.). Washington DC: American Psychological Association.

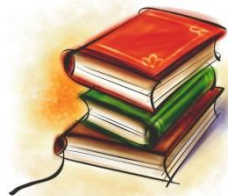
## Calculator:

You will need a calculator that is capable of calculating square roots for the homework, project, and midterm and final exams. Students are encouraged to bring calculators to class each day.



## Supplemental Readings:

In addition to the textbook (listed above), supplemental readings may be assigned periodically. These readings will be posted on Blackboard.



## Lecture Materials:

Students are responsible for bringing all lecture materials related to that day's topics. Materials can be printed, or viewed on a laptop or iPad. Materials will be posted on Blackboard by the morning of the day of class. If they are not posted by the morning of the day of class, then I will bring any necessary materials for that class session to class.

**Note:** *The lecture notes are not meant to be a substitute for engaging in the lectures/exercises. Not all material covered in lectures/exercises is in the lecture notes. I provided you with lecture notes as a favor to you so that you are not spending time copying formulas, graphs, and output. However, it is your responsibility to take notes on other material covered during class lectures/exercises.*

SPSS

## SPSS:

This course will use Statistical Package for the Social Sciences (SPSS) computer software. Students are expected to have access to SPSS/PASW to complete homework assignments. There are several options for utilizing this program:

1. GSEHD Technical Services provides a free version of SPSS for current students in GSEHD ([gsehdtec@qwu.edu](mailto:gsehdtec@qwu.edu)).
2. A 6- or 12-month rental version of the software program can be purchased from the following website (recommended by former students): <http://www.onthehub.com/spss/>. This software can be installed on the student's own computer. SPSS software has built-in safeguards to prevent unauthorized copying of software. If you choose to rent a copy of this program, be sure you buy the STANDARD GRADPACK VERSION. The Statistics Base Gradpack is limited and does not do all of the analyses we will be conducting in this course.
3. The student can use SPSS in one of the computer labs on campus. Note: That the basic version of SPSS installed on computers in Foggy Bottom computer labs does not do some of the analyses required for this course.
4. A 14 day trial version can be downloaded from the IBM/SPSS website: [http://www14.software.ibm.com/download/data/web/en\\_US/trialprograms/W110742E06714B29.html](http://www14.software.ibm.com/download/data/web/en_US/trialprograms/W110742E06714B29.html)

**DISCLAIMER:** Be sure you are using THE STANDARD GRADPACK VERSION of SPSS. The Statistics Base Gradpack is limited and does not do all of the analyses we will be conducting in this course.



# COURSE GRADES

Your assessments will be combined according to the percentages shown below:

## Weighted Composite Grade:

Homework (4)	30%
Project	15%
Article Critique	5%
Midterm	25%
Final	25%

Final grades will be assigned based on the following scale:

## Letter Grade Scale:

92% and above	A
90% - 91.99%	A-
88% - 89.99%	B+
82% - 87.99%	B
80% - 81.99%	B-
78% - 79.99%	C+
72% - 77.99%	C
70% - 71.99%	C-
69.99% and below	F

*If you receive a failing grade (i.e., less than 70%) on BOTH the Midterm & Final exams you will receive a letter grade of F in the course.*

## Grading Policies:

- Numerical grades will not be rounded.
- Grades will not be changed unless a computational error has been made.
- No grades will be dropped.
- There will be no extra credit.
- Grades of "Incomplete" will not be given unless the student can demonstrate that near catastrophic events have led to a cause of extreme hardship.

# ASSESSMENTS

## Homework/Assignments:

There will be several homework assignments, each designed to give students a chance to apply and practice the concepts learned in class. The possible points for each assignment vary based on the amount of material covered. Students may discuss the homework with other students in the class but you must each turn in your own homework with your own computations and explanations written in your own words. Homework assignments will be posted on Blackboard approximately 2 weeks before the due date.

## Project:

Based on your own data, that of a faculty member in your area, or that from an available database (e.g., public use dataset on the web), students will complete a project that uses multiple regression analysis. There will be two parts of this research proposal: a presentation, and a paper. More specific details of this project can be found on Blackboard. Students should start hunting for some data early in the semester. Students are encouraged to discuss their project topics with the instructor during office hours or during another appointment.

## Article Critique:

Students will be required to review and critique an APPLIED PUBLISHED research article involving the use of multiple regression or logistic regression from a PEER-EDITED SCHOLARLY JOURNAL. No two students will be allowed to review the same article. Your critique will include you answering a series of short questions about the article. A copy of the article should be turned in with your critique. See Blackboard for more details.

## Exams:

The midterm and final exams will cover the topics presented in the first and the second half of the semester, respectively. However, due to the cumulative nature of the course content, key concepts from earlier topics will be used in later parts of the course and thus may appear on both exams.

Students are allowed to use calculators for the exams. Calculators may not be shared. Cell phone calculators are not permitted. Exams are to be completed independently; students found doing otherwise will be subject to the maximum university penalties. For security purposes you are not allowed to keep your exams. You are welcome to view and discuss your exams with me during office hours. Any student who does not return his/her exam will be given a grade of 0 on the exam.

*Note: you have approximately 2 weeks to complete course assessments (more time for the project and article critique). Thus, you should grant me the same leniency and expect that it will take me 2 weeks to grade your work.*



# SUBMITTING ASSESSMENTS

All assessments should be submitted via Dropbox: (<http://www.dropbox.com/>). Dropbox is a method of sharing files from one computer to another. This eliminates the need to email files back and forth. **Emailed assignments will NOT be accepted.** See the handout on Blackboard for how to download the Dropbox application, create a folder, and share the folder with me.

During the first week of the semester you should:

- 1) Sign-up for your free Dropbox account, Download and install the software (if you don't already have it).
- 2) Create a folder in Dropbox that includes your name on record at GW followed by the course number in parentheses. For example:  
Sally Student (EDUC 8171)
- 3) Share the folder with me at [weissba@gwu.edu](mailto:weissba@gwu.edu)
- 4) Add a picture of yourself to your Dropbox folder ☺



**Karl Pearson**

who developed the Pearson Correlation Coefficient, Pearson  $\chi^2$ , and many other important statistics

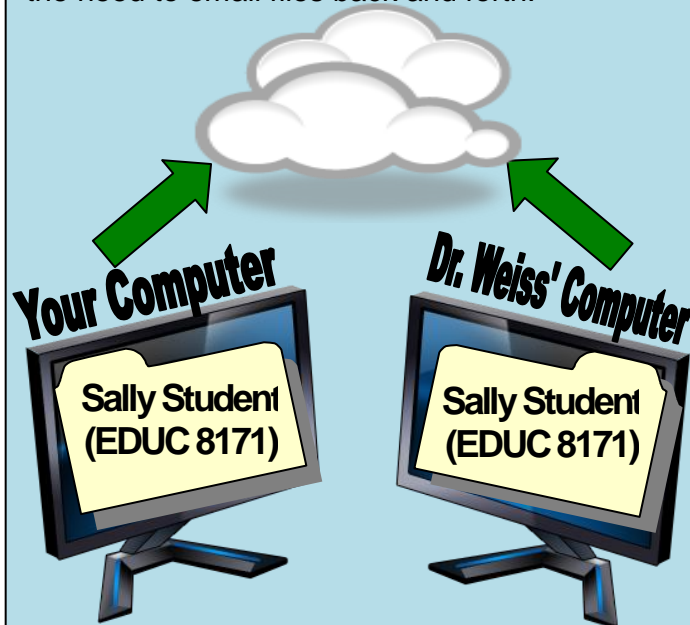
When submitting ALL assessments please be sure you have followed the guidelines below. Any assignment that has not followed all of these guidelines will NOT be graded.

- The filename includes both your name and the title of the assessment. For example, "Sally Student – Homework #1.doc"
- Your name is included on the first page of the assessment.
- Each assessment should be submitted in a SINGLE file (i.e., do not use multiple files for homework and output). This means that you will need to copy and paste your SPSS output into the appropriate places of your assignment.
- The SPSS output portion of your homework should be edited to only include the relevant information. This means that you should NOT include SPSS syntax, error messages, or extra tables/graphs from additional analyses that you have run.
- Be sure all tables, graphs, and text are visible. If anything is running off of the page that section will be counted as missing and you will be penalized the corresponding number of points.
- The file must be in MS Word format. PDF files will not be accepted. No other file formats will be accepted. I will grade assignments using the comments feature in MS Word and may add typed comments directly into the document.

*Note: please ONLY put completed assessments in your Dropbox folder (i.e., do not store files in your Dropbox folder that you do not want graded and do not store personal files in your Dropbox folder.)*

# DROPBOX

Dropbox is a free cloud computing service. Cloud computing is a method of sharing files from one computer to another. This eliminates the need to email files back and forth.



# LATE WORK POLICY

## Policy on Late Assessments:

Due dates for each assessment are listed on the course schedule. Assessments must be submitted by midnight. Anything submitted after this time on the due date will be considered late. **If assessments are handed in late, they will be penalized 20% of the total possible credit if handed in within one week of the due date. Assessments handed in one week or more late will not be graded and will not receive any credit.** Requests for time extensions must be submitted and approved in writing prior to the due date. Time extensions for assessments will not be given except in cases of approved medical or family emergencies where accompanying written documentation is provided by the student.

The Dropbox website tracks when files are added and updated in Dropbox. It is your responsibility to ensure assessments have been properly uploaded.

# INCOMPLETE WORK

## Incomplete Work:

Incomplete assessments that are submitted will NOT be graded. It is unfair for me to have to spend time grading and giving you feedback on work that is incomplete. Incomplete work will be given a grade of 0, after the allowed late time.

# ACCOMMODATIONS

## **Missed Exams:**

Due to the need for equity and classroom management, I must guard the security of all tests. No make-up examinations will be given without written documentation of a medical emergency or other excused University absence. If you wish to make-up work, you should provide me with a written note stating the date(s) of your absence, the reason for your absence, and the work that you are requesting to make-up. You should attach documentation of a university-approved reason for your absence and submit the note and the documentation to your instructor within one week of your return to class. Make-up exams may differ from the in-class exam.

## **Religious Accommodations:**

It is the policy of The George Washington University that students not be penalized for participation in religious observances. Students shall be allowed, whenever practicable, to make up academic assignments that are missed due to such absences. It is the student's responsibility to contact the instructor for each course in which work is missed, and make arrangements for make-up work or examinations. Students are responsible for information and material missed on the day(s) of absence. The student is responsible for providing written notification to the professor within the two weeks of the semester. The notification must identify the religious holiday(s) and the date(s). The student shall hand the written notification to the instructor personally to avoid problems with collecting mail from mailboxes or e-mail. The process should be confidential. Since the final exam for this course will not yet be scheduled within the first week of class, please include any religious observances during final exam week in your written request.

Work missed for any excused absence (i.e. due to religious observance, illness, etc.) must be made up within a timely manner. Any work missed should be made up within one week of the student's return to class, unless otherwise specified by the instructor.

## **Academic Accommodations:**

If you need academic accommodation by virtue of a documented disability, please contact the course instructor as soon as possible to discuss your needs. Students with documented needs for an accommodation must meet the same achievement standards required of all other students, although the exact way in which achievement is demonstrated may be altered. All requests for academic accommodations should be made during the first two weeks of the semester. Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: <http://gwired.gwu.edu/dss/>

# INTEGRITY

The George Washington University has a nationally recognized Code of Academic Integrity. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. Please review the University's policy on academic integrity, located at [www.gwu.edu/~ntegrity/code.html](http://www.gwu.edu/~ntegrity/code.html). All graded work must be completed in accordance with The George Washington University Code of Academic Integrity. Any student caught with unauthorized materials, or cheating in any other manner during exams or on assignments will be referred to the Academic Integrity Office, the student will be recommended for the maximum sanction which is to receive a grade of F on his or her transcript. In accordance with the Code of Academic Integrity, all sanctions shall be marked on the respondent's permanent record (i.e., transcript) with the phrase "Academic Dishonesty".

# EMAILS

I receive a plethora of emails on a daily basis from students. I try to respond to emails within 48 hours during the workweek, but this is not always possible. Please be aware that the number of emails I receive tends to increase exponentially before an assessment is due and as the end of the semester approaches. Thus expect that it could take longer for me to respond to emails at those times.

FYI - I respond to course content emails most Mon-Thur mornings (i.e., not on the weekends; not in the evenings). Please do not email me on Friday afternoon and then email me the same question on Monday morning.

I do not respond to emails that do not include a salutation, your name, and the course number and section (e.g, EDUC 8171, Wednesday nights). I teach multiple large classes a semester and work with many other students at the University, and I can't always remember what class you are in.

# ATTENDANCE

Class attendance is not a requirement for this course, except on exam dates. However, participation is crucial to your success in this course. Students are responsible for all course material presented in class and indicated in the course lecture notes or text. Some material presented in class may not be in the textbook, and vice versa. Additionally, handouts may be distributed during class which may not be posted on Blackboard.

If you miss class it is your responsibility to learn the material on your own, and it is your responsibility to acquire handouts from classmates. I will not hold private class sessions in my office for students who miss class, and I may not post all handouts on Blackboard.

# TENTATIVE COURSE SCHEDULE

The topics listed for each class meeting on the schedule are tentative and subject to change. The topics will most likely be covered in this order. However, depending on class time we may cover topics slightly earlier or later than the dates shown below. The due dates are also tentative and subject to change. The chapters and page numbers for the readings correspond with the Cohen et al. (2003) textbook.

Week	Day	Date	Topics	Readings	Assessment Due
1	Wed	1/16	<b>Note: Class will begin at 5:30pm</b> Introduction		
2	Wed	1/23	Correlations (Review)	Cha 1-2 pg 117-140	Create & Share Dropbox folder & add photo of you
3	Wed	1/30	Simple Linear Regression		
4	Wed	2/6	Partial and Semi-Partial Correlations Multiple Regression	Cha 3	Hmwk 1
5	Wed	2/13	Multiple Regression Nested Models		
6	Wed	2/20	Nested Models Non-Nested Models	pg 158-175 T&F pg 145-147	
7	Wed	2/27	Categorical Predictors	Cha 8 MacCallum et al.	Hmwk 2
8	Wed	3/6	MIDTERM		Midterm
-	Wed	3/13	SPRING BREAK - NO CLASS		
9	Wed	3/20	Binary Logistic Regression	Cha 13	
10	Wed	3/27	Prediction Methods Power	pg 176-182 pg 90-94	Hmwk 3
11	Wed	4/3	Nonlinear Effects Interaction Effects	Cha 7 & 9 Aiken & West Baron & Kenny	Article Critique
12	Wed	4/10	Mediation Effects Path Analysis		Hmwk 4
13	Wed	4/17	Project Presentations	Kline Kelly & Maxwell	Project Presentation <sup>1</sup> Project Paper
14	Wed	4/24	FINAL EXAM		Final Exam

<sup>1</sup> Face-to-face students must be present for the project presentation date. This will be the only day that you are allowed to present the project. If you need to miss this class for any reason, please provide me with written documentation within the first 2 weeks of the semester. Anyone who has a religious/academic/work conflict on the class presentation day, will be required to give his or her presentation during class the prior week.



# SUPPLEMENTAL READINGS



In addition to the textbook, supplemental readings may be assigned periodically. These supplemental readings are seminal journal articles or book chapters that cover topics that are not directly covered in your textbook.

- Aiken, L.S., & West, S.G., (1991). Chapter 2: Interactions between continuous predictors in multiple regression. In *Multiple Regression: Testing and Interpreting Interactions*. Thousand Oaks: Sage.
- Baron, R. M., & Kenny, D. A., (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Kelly, K., & Maxwell, S. E. (2010). Multiple regression. In Gregory R. Hancock & Ralph O. Mueller (Eds.), *The Reviewer's Guide to Quantitative Methods in the Social Sciences*. New York, NY: Routledge.
- Kline, R. (2009). Chapter 10: Presentations. In *Becoming a Behavioral Science Research: A Guide to Producing Research that Matters*, New York, NY: The Guilford Press.
- MacCallum, R.C., Zhang, S., Preacher, K.J., & Rucker, D.D. (2002). On the practice of dichotomization of quantitative variables. *Psychological Methods*, 7, 19-40.
- Tabachnick, B.G., & Fidell, L.S. (2001). Chapter 5: Multiple Regression. In *Using Multivariate Statistics*, 4th edition. Boston: Allyn and Bacon.

Note: Other supplemental readings may be assigned periodically. These readings will be posted on Blackboard.

# TIME MANAGEMENT



The traditional credit hour is based on the Carnegie unit of measurement in which 1 credit hour equates to 3-hours of work per week in that course (including both in-class and out-of-class time), over a 15-week period. Thus, under this unit of measurement a 3-credit hour course equates to 9 hours of work per week in that course over a 15-week period of time. Some students taking this course report spending less time than this for my courses, but this rule-of-thumb should help you plan and schedule appropriate amounts of time for completing assignments in courses.

The assessments in this course necessitate more than one evening to complete them. Thus, I recommend you begin working on these as soon as possible so that you have time to complete them to the best of your ability and ask clarification questions if necessary.

**Summer Courses:** The nature of Summer courses is such that you have approximately 2.5-weeks of material covered in a single week. This means that for a 3-credit 6-week Summer course, you should expect to spend approximately 22.5 hours per week with course material.

# ONLINE SECTION

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Students who have enrolled in the online section of this course are NOT expected to attend class meetings; however, they are welcome to attend as many or as few of the class meetings as they want in lieu of partaking in the course at home. For students taking the online format of the course, video lectures will be posted on Blackboard. Students in the online section are required to watch the video lectures and complete all practice exercises.

## **Lectures:**

Each topic for this course is setup as a separate learning module. It should take you approximately 30-120 minutes to complete each learning module (equivalent to one class period or less). I recommend setting aside at least 2 consecutive hours per week to complete a given learning module. I highly recommend completing ALL activities in a given learning module. You should also set aside additional time during each week to complete reading assignments and assessments as stated on the course syllabus.

You are welcome to attend any of the class meetings in lieu of completing the online learning module.

## **Presentation:**

You are required to complete all of the same assessments as the students taking the face-to-face course. Although you may not regularly attend class meetings, you are still required to give a presentation. You do NOT need to give the presentation to the class, however. Instead, you will be required to prepare a brief presentation using a video recording software program and submit it to your Dropbox folder.

You have several options for recording your presentation (see <http://tlc.provost.gwu.edu/creating-presentations> ). First, if you choose to use powerpoint you can use a screen-recording software program (for example, the free software program CamStudio: [www.camstudio.org](http://www.camstudio.org) or the full version available for purchase, Camtasia (<http://www.techsmith.com/tutorial-camtasia-8.html>)). These programs can be used to capture the content on your computer screen while simultaneously recording your audio voice-over. A second option is to use narrated powerpoint (e.g., [http://itl.gwu.edu/pdf/FOSS\\_Narrating\\_Powerpoint.pdf](http://itl.gwu.edu/pdf/FOSS_Narrating_Powerpoint.pdf)). Finally, you can alternatively create a handout for your visual aid and use your web camera to record yourself (not the visual aid) while giving your presentation.

## **Exams:**

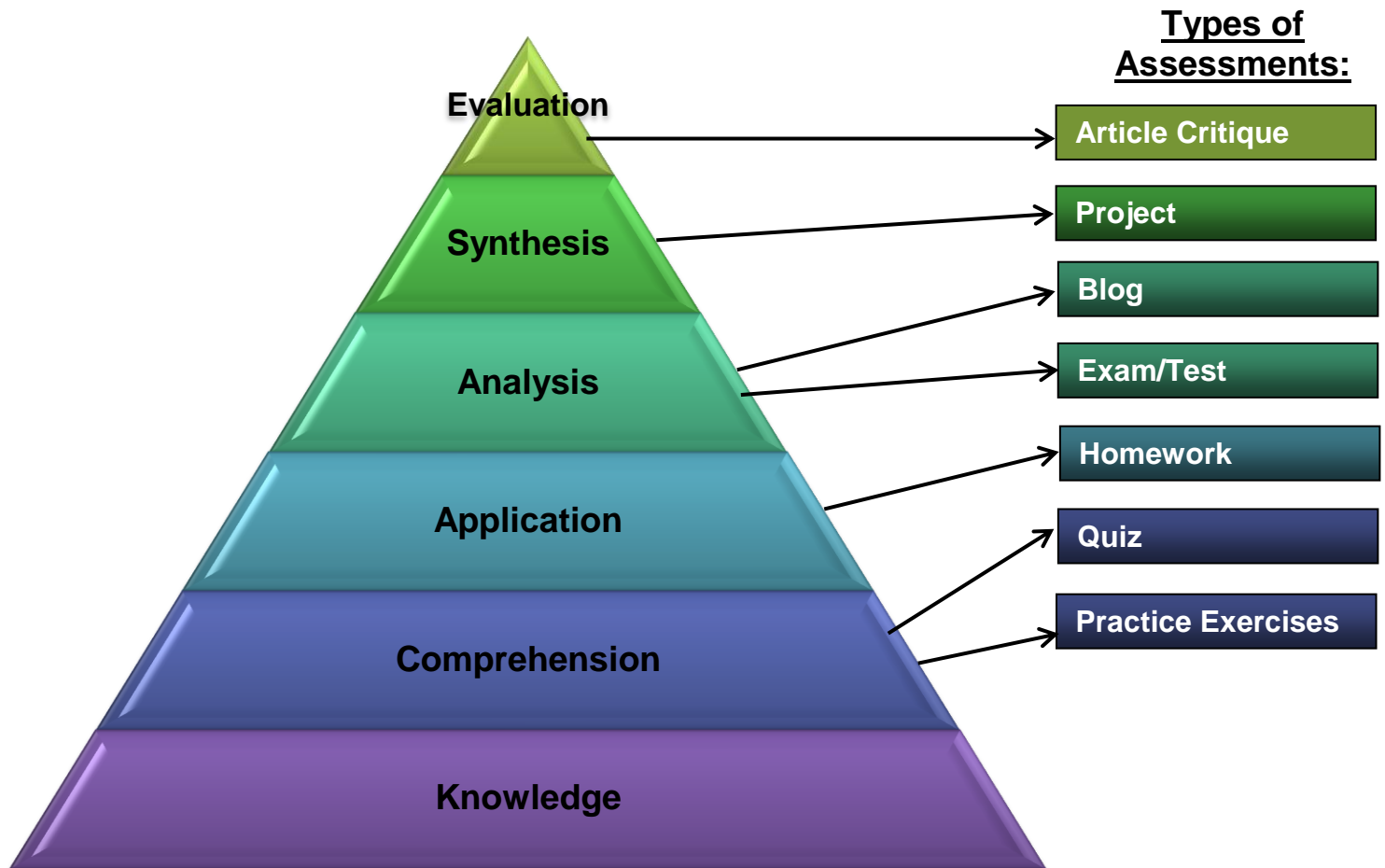
You are held to the same measureable learning objectives as the students taking the face-to-face course. However, the items and format of your exams may differ from the in-class exam. More information about the exams will be made available as the semester progresses. You are **NOT** allowed to work with others or discuss the exam with anyone.

Students registered for the face-to-face section of the course must complete the in-class version of the exam.



# BLOOM'S TAXONOMY

Bloom's taxonomy is a tool for classifying subject matter learning objectives. The taxonomy is a guide used to classify objectives according to their level of cognitive complexity. The lowest level of cognitive complexity is the Knowledge level, while the highest level is Evaluation. Learning objectives for this course (and other courses) can be classified using Bloom's Taxonomy.



**Evaluation - Make judgments about the extent to which material satisfies criteria**

**Synthesis – Combine elements to form a new original entity**

**Analysis – Understand organizational structure of material; draw comparisons and relationships between elements**

**Application – relate previously learned material to new situations**

**Comprehension – Explain or summarize in one's own words**

**Knowledge – Recognize facts, terms, and principles**