

## ANA620 Course Outline

**Course Title:** ANA 620 Continuous Data Methods

**Instructor:** Dr. Suthakaran (Sutha) Ratnasingam

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**Lecture Hours:** Friday – 5.30 – 7.30 PM (PDT)

**Office Hours:** Friday – 5 – 5.30 (PDT), and by appointment

**Zoom Link:** <https://nu.zoom.us/j/94091552687>

**Course Prerequisites:** ANA 615 Data Mining

**Textbook:** Introduction to Linear Regression Analysis, 6th Edition Douglas C. Montgomery, Elizabeth A. Peck, G. Geoffrey Vining ISBN: 978-1-119-57872-7 March 2021

**Software:** R & Python

**Course Description:** Application of methods for analyzing continuous data for knowledge discovery. Analytic continuous data concepts and methods are developed with practical skills in exploratory data analysis. Descriptive statistics, goodness-of-fit tests, correlation measures, single and multiple linear regression, and analysis of variance and covariance are covered. Applying continuous data methods using case studies and real-world data will leverage statistical assessment and interpretation.

### Course Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Interpret the methods, tests, and assumptions in continuous data analysis.
- Evaluate strategies to conduct data analysis with continuous response data.
- Organize data for statistical analysis of continuous data.
- Design technical and strategic objectives for analysis of continuous data.
- Analyze continuous data using linear models (single and multiple) to test hypothesis.

Material covered in this course also develops the following Program Learning Outcomes (PLOs):

- PLO#3: Construct data files using advanced statistical and data programming techniques to solve practical problems in data analytics.

### Course Schedule, Topics, and Assignments:

In addition to successfully achieving the learning outcomes, students are expected to participate in all class activities, complete exams as scheduled, and turn in all assignments on time. Failure to do so will result in the loss of points.

All assignments are due at MIDNIGHT SUNDAY Pacific Time. For each day after the due date that an assignment is turned in late, its point credit will be reduced by 10%. No assignments will

be accepted after solutions have been posted, or after the assignment has been discussed in class.

<b>Module 1: Introduction to Linear Regression and Data Visualization</b>	<b>Homework</b>	<b>Activities</b>
Lesson 1: What is Regression?	Assignment #1 (Due on 02/09)	Discussion #1
		Discussion #2
<b>Module 2: Simple and Multiple Linear Regression and Evaluation</b>		
Lesson 2: Evaluating Regression Results Lesson 3: Simple Regression Lesson 4: Multiple Regression	Assignment #2 (Due on 02/16)	Discussion #3
<b>Module 3: Data Correlation and Transformation</b>		
Lesson 5: Correlation Lesson 6: Log Transformation	Assignment #3 (Due on 02/23)	Discussion #4
<b>Module 4: Data Reduction and Variable Selection Methods</b>		
Lesson 7: Variable Reduction and Selection Methods Lesson 8: Generalized Linear Model (GLM)	Assignment #4 (Due on 03/02)	Discussion #5

### Course Grading:

Course grading will be a combination of objective and subjective measurements to evaluate student performance based on homework assignments and threaded discussion, along with qualitative evaluations of each

Discussions (Discussion 1 will NOT be graded, 25 points per module)	100
Assignments (1 per module) with qualitative evaluations	900
Total Points	1000

When answering essay questions on homework or exams, it is OK to refer to course material and other reference materials, but it is NOT OK to substantially copy the wording from these materials. **Answers to essay questions and threaded discussion posts must be written in your own words.** If an instructor judges that the answer is worded substantially the same as in the course or reference material or as submitted by another student, it may be considered

academic dishonesty and subject to consequences described in the university catalog. For example, if textbook material is copied and pasted into the answer to a homework or exam question, a score of zero will be given for that question and a warning will be issued by the instructor. Repeat offenses may result in a score of zero given for the entire exam/quiz/homework/discussion, reporting of the incident to the NU Judicial Affairs Office, and a failing grade in the class.

#### **Grades and Grading System:**

A = 95-100%, A- = 90-94%, B+ = 87-89%, B = 84-86%,  
B- = 80-83%, C+ = 77-79%, C = 74-76%, C- = 70-73%, D+ = 67-69%  
D = 64%-66%, D- = 60-63%, F = < 60%

Grades that are in-between will be rounded up/down to the nearest whole number. For example, 94.4 and below will become 94%, while 94.5 and above will round up to 95%.

**A** - Outstanding Achievement  
**B** - Commendable Achievement  
**C** - Marginal Achievement  
**D** - Unsatisfactory \*  
**F** - Failing \*

\* Student receiving this grade in a course that is required for his/her degree program must repeat the course.

**I: Incomplete:** A grade given at the discretion of the instructor when a student who has completed **at least two-thirds of the course class sessions** and is unable to complete the requirements of the course because of *uncontrollable* and *unforeseen* circumstances. The student must convey these circumstances (preferably in writing) to the instructor before the course's final day. If an instructor decides that an "Incomplete" is warranted, the instructor must convey the conditions for removal of the "Incomplete" to the student in writing. A copy must also be placed on file with the Office of the Registrar until the "Incomplete" is removed or the time limit for removal has passed. An "Incomplete" is not assigned when the only way the student could make up the work would be to attend a major portion of the class when next offered.

An "I" that is not removed within the stipulated time becomes an "U." No grade points are assigned.

**W: Withdrawal:** Signifies that a student has withdrawn from a course after beginning the third class session. Students who wish to withdraw must notify their admissions advisor before the beginning of the sixth class session in the case of graduate courses. Instructors are not authorized to issue a "W" grade.

#### **Threaded Discussions (25 points per module; 100 points total)**

The educational goal of the threaded discussion is to give students an opportunity to reflect on the conceptual material and the class discussions and synthesize this knowledge into understanding of the course learning objectives. The threaded discussion assignments will be graded based on **Quality of information** and **Delivery of Information**. *For moderate performance levels, students need to answer the questions in detail AND respond to one other post. To receive maximum points in the high-performance levels, students should answer all the questions and respond in detail to at least two other posts.*

<b>Grading (On a scale of 0-25)</b>	<b>Quality of Information</b>	<b>Delivery of Information</b>
0-10 points: Low performance	Post is not related to the assignment; irrelevant remarks are made; no response to other posts.	Poor spelling and grammar, "hasty" appearance, professional vocabulary not used, and attitude negative or indifferent.
11-20 points: Moderate performance	Post is related to topic; supporting details or examples are not included in sufficient breadth or depth; the author simply restates concepts from others (textbook, instructor). One response to another post.	Few grammatical or spelling errors, professional vocabulary used most of the time, and positive attitude displayed frequently.
21-25 points: High performance	Supporting details and examples are both broad and deep; the author shows originality and does not just restate the textbook or instructor; multiple detailed responses to other posts.	Consistent grammatically correct posts with professional vocabulary, no misspellings, and positive attitude displayed throughout.

### **Assignments (900 points total)**

The educational goal of Assignments/HW is to check analysis and synthesis of the class material and applications to analytical problem solving. The homework must be completed and submitted by midnight on Sunday. Only submissions in Word or PDF will be accepted.

Please include your last name and the module number in the filename of your homework. For example: LastName\_Module1 homework.pdf

### **National University Policies and Procedures**

Please see the current policies and procedures in the catalog (<https://www.nu.edu/catalog>) and the syllabus in the Brightspace course.