Northeastern University
College of Professional Studies
ALY6010 Course Syllabus –

Course Number:	**ALY6010**
Course Name:	**Probability Theory and Introductory Statistics**
CRN:	**71709**
Quarter / Year:	**2020 Fall Quarter, 2nd half**
Term Length	**6 Week Term**
Start / End Dates	**26-OCT-2020 to 8-DEC-2020**
Course Format:	**Blended**
Instructor Name:	**Tom Breur**
Instructor E-mail:	**a.breur@northeastern.edu**
Office Hours	**N/A**

Technical Requirements

In order to access this course, you will need a NORTHEASTERN UNIVERSITY'S COLLEGE OF PROFESSIONAL STUDIES online **Canvas** account, which can be obtained via the following link: **http://nuonline.neu.edu/** Additional technical requirements include access to Adobe Acrobat and PowerPoint. Please see the Technical Help section of the course in Blackboard.

Each student is expected to be responsible for his or her access to the internet for purposes of this course and for research. Internet access is a required component of this course and will not be accepted as an excuse for missed work. If you know that you will be traveling, then make sure you plan accordingly.

Note regarding e-mail/voicemail: If you e-mail me, please include your name and class title (both course number ALY6010, as well as CRN). I will try to reply within 24 hours, but please allow up to 48 hours for an email reply. All class correspondence will go to your assigned NEU email account. Any emails being sent to the whole class will go to your NEU email. It is mandatory you use your NEU/Husky email account when contacting your instructor.

Required Text(s)/Software/Tools:

1. *Elementary Statistics, A Step by Step Approach: A Brief Version*, 10th Edition, Allan G. Bluman, McGraw Hill Publishing, ISBN: 97812600420009

2. R in Action 2nd Edition. R. Kabacoff, Manning Publishing: ISBN 9781617291388

Optional
1. Discovering Statistics Using R, Andy Field, Jeremy Miles, Zoe Field, Sage Publishing ISBN-13: 978-1-4462-0046-**9**

Software (required):
- Microsoft Office 2016 (Excel, Word, PowerPoint)
- R Programming
- R Studio

Course Prerequisites

ALY 6000

Course Description
Introduces statistics for business analytics from an analysis-of-data viewpoint. Topics include frequency distributions; measures of location; mean, median, mode; measures of dispersion; variance; graphic presentation; elementary probability; populations and samples; sampling distributions; categorical data; regression and correlation; and analysis of variance. Explores the use of statistical software in data analysis. Weekly projects emphasize hands-on application of probability and statistics in Excel and data problem solving with advanced Excel techniques.

Program Student Learning Outcomes (SLOs)
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Specialized Knowledge	Broad and Integrative Knowledge	Applied and Collaborative Learning	Civic and Global Learning	Experiential Learning
SLO 1	**SLO 2**	**SLO 3**	**SLO 4**	**SLO 5**
Integrate the major theories, tools, and approaches in data analytics to identify and successfully communicate data-driven insights for informed decision-making.	Articulate and effectively defend the significance and implications of the work in data analytics in terms of challenges and trends in a local, national or global context.	Apply the principles, tools and methods of analytics to a comprehensive real-world problem or project related to data analyses for tactical and/or strategic decision making; present data, information and/or analytical insights and recommendations for successful implementation of the project.	Propose an effective path to resolution of an analytical problem that may be complicated by the competitive environment, opposing interests, divergent or uncertain data and information.	Apply the principles, tools and methods of analytics to a project within a sponsoring organization to successfully assist with the extraction, development, delivery, and/or translation/ implementation of data analysis for tactical and/or strategic decision-making in organizations.

Course Outcomes(COs)
Upon the successful completion of this course, students will be able to:
1. Explore the use of statistical software in data analysis through hands-on applications
2. Create distributions and graphical representation based on given data and identify which distribution models best fit the data.
3. Apply the theory of probability to calculate events' likelihoods, understanding the differences between experimental and theoretical probabilities (the Law of Large

Discussion Board Grading

A/A- (9-10 points) Outstanding/Exceeds Expectations	Student participates more than three times during the week and posts outstanding information. ⇒ Posts are made in time for others to read and respond (initial contribution posted on or before day 3) ⇒ Student submits 2 responses to other student posts on or before day 7 ⇒ Initial post has academic research references ⇒ Student delivers information that shows thought, insight, and analysis have taken place ⇒ Student makes connections to previous or current content or to real-life situations ⇒ Posts contain new ideas, connections, or applications
B+/B (7-8 points) Proficient (Meets Expectations)	Student participates at least two times during the week and posts proficient information. ⇒ Posts are made in time for others to read and respond (initial contribution posted on or before day 3) ⇒ Student submits 2 responses to other student posts on or before day 7 ⇒ Posts deliver information that shows thought, insight, and analysis have taken place. ⇒ Posts contain new ideas, connections, or applications, but they may lack substance or detail
B- (6 points) Basic	Student participates at least one time during the week and posts basic information. ⇒ Posts may not all be made in time for others to read and respond ⇒ Posts are generally competent, but the actual information the student delivers seems narrow and unoriginal. ⇒ Student makes limited, if any, connections, and those often consist of vague generalities ⇒ Posts contain few, if any, new ideas or applications, and are often a rewording or summary of other students' comments
C+ (5 points or less) Below Expectations	Student participates at least one time per week and posts information that is below expectations. ⇒ Posts may not all be made in time for others to read and respond ⇒ Student lacking at least 2 responses to other students' posts on or before day 7 ⇒ Student contributes no new ideas, connections, or applications ⇒ Posts may be completely off-topic

Numbers), and calculate posterior probabilities by using the Bayes' Law with emphasis on applications.

4. Perform estimations of population parameters using confidence intervals based on one sample and perform estimations of the difference between two population parameters of the same kind based on two samples.
5. Conduct linear regression analysis to study associations between numerical and categorical variables respectively; and justify the legitimacy of the regression model.
6. Perform various hypothesis tests, including those for a population parameter (single sample), and the difference between two population parameters of the same kind (two samples).
7. Interpret meaningful relationships and patterns in the data in relation to a given business question
8. Construct a sound business question, generate data to understand the business question and then detect meaningful relations and patterns in data to explore answers to the business question.

Course Methodology
Each week, you will be expected to:
1. Review the week's learning objectives.
2. Complete all assigned readings
3. Complete all text reading and problem sets for the week
4. Participate in the Discussion Board
5. Complete and submit all R and Bluman assignments and tests by the due dates
2. You should expect to spend 2 – 3 hours per day on this material.

Participation/Discussion Board

Please read all lecture materials and assigned readings prior to each class session. Each week there will be graded discussion questions.

Weekly Quizzes Students should expect during 1 – 6 at least 4-6 quizzes on Bluman material and at least 1 quiz on Kabacoff material. 2 Final exams (Week 7): 1 based on Bluman and 1 based on Kabacoff material.

Projects
Each week you will create 3 R projects and upload them to the Canvas for your instructor to review and grade by the end of the course. R scripts which were cut and pasted from textbook materials will be scored poorly. You will also do much more poorly on R quizzes and exams. You learn programming best by typing each line of code into your R file. It will be evident to your instructor whether you copied or typed your own code segments.

Final Assessment
Students will complete 2 final assessment exams during week 6 of the course. The final assessment exams are timed, cumulative, and will consist of 25-30 multiple choice and/or free response questions.

There will be one attempt allowed for each exam. Students will be able to access the exam results each time upon completing the exam. The final assessment should be completed by 11:59 PM (Eastern) on the last day of the class.

Communication/Submission of Work
In the Assignments folder, click on the View/Complete Assignment link to view and each assignment. Attach your completed assignments here and click Submit to turn them in to me. Once your assignment has been graded, you will be able to view the grade and feedback I have provided by clicking on My Grades in the Tools module from the Northeastern University Online Campus tab.

Grading/Evaluation Standards ALY6010V4B

Assignment	Weight in Course Grade
Weekly Discussions	15%
3 R Script Projects	40%
Weekly Quizzes	30%
2 Final Assessments	20%
Total:	100%

Late Turn-in Policy:

Students may sometimes face illness or other exceptional circumstances that may impact their ability to attend class and complete work requirements. The information below provides an overview of the related policy and procedures:

- Exceptional circumstances may include, but not limited to, natural disasters, military deployment, death of a family member, unexpected work travel, or unexpected child or elder care. If the student wants to make up the assignments missed due to illness or exceptional circumstances, the student should provide the instructor with documentation that supports either the illness or the exceptional circumstances.
- Other circumstances: Outside of illness or exceptional circumstances, students who submit work after the assigned due date can expect a reduction of points:
  - (a) All late assignments should be submitted by the last Saturday of class.

Grading Scale:

Course Average	Letter Grade
95 - 100	A
90 – 94.9	A-
87 – 89.9	B+
84 – 86.9	B
80 – 83.9	B-
77 – 79.9	C+
74 – 76.9	C
70 – 73.9	C-
69.9 or below	F

Class Schedule & Topical Outline

Week	Dates	Topic	Assignments
1	10/27–11/2	Probability & Normal Distributions	Module 1 Discussions, Quizzes, R script Project 1
2	11/3–11/9	Confidence Intervals	Module 2 Discussions, Quizzes, R Project 1
3	11/10–11/16	Hypothesis Testing	Module 3 Discussions, Quizzes, R script Project 3
4	11/17–11/30	Testing Differences	Module 4 Discussions, Quizzes, R Project 3 Due
5	12/1–12/7	Correlation & Regression I	Module 5 Discussions, Quizzes, R script Project 3
6	12/8–12/12	Correlation & Regression II	Module 6 Discussions, Final Exam, R Project 3 Due

Documentation Guidelines

The MPS in Analytics program requires the use of APA guidelines for citing sources. Why is proper citation important? It signals that every student is an active and informed participant in the College's academic community. It enables instructors to understand how sources are used to support perspectives and conclusions. And it forms the basis for ethical communication practices that are expected in a professional career in communications or any other field.

For these reasons, students are responsible for learning how to use proper APA citation methods. To do so, students can review APA guidelines on the Purdue Online Writing Lab website, or make an appointment with the International Tutoring Center or the Writing Center on the Northeastern campus. Please use the refer to the middle column in the linked citation chart under APA: https://owl.english.purdue.edu/media/pdf/20110928111055_949.pdf

Failure to use APA guidelines to document sources will result in grade deductions. For a pattern of careless citation errors, the **maximum** possible grade a student can earn on that particular assignment (or section of an assignment) is 70% of the total possible points. For instances of plagiarism and other types of violations of academic integrity such as unauthorized collaboration with another student or submitting work from a prior course, the **maximum** possible grade a student can earn on that particular assignment is 50%, as well as possible referral to the Office of Student Conduct and Conflict Resolution.

Each paper needs to be handed in via Turnitin; papers that contains more than 20% non-original material will not be accepted.

C.   **Late Submission of Work**
Each assignment is due on the date indicated - late assignments will not receive any points. There are no make-up dates, extensions, or re-works for the assignments after they are handed in, except for documented personal emergencies or special permission granted by the instructor in writing. Special permission must be requested in writing to the instructor at least two days prior to the due date of the assignment.

D.   **Attendance/Tardiness (Blended/Hybrid/Traditional Classes Only)**
As the weekly class session is a vital part of the learning experience, all students are expected to attend every week, be on time for the start of class, and stay until the end of class.

However, in the event of extraordinary, legitimate and unavoidable situations, students may be excused for lateness or absence. Extraordinary, legitimate and unavoidable situations include personal illness, urgent family business, work-related issues, transportation-related issues, religious requirements. If at all possible, students should let the instructor know by e-mail about the excused absence or lateness before class.

Academic Integrity Policy

A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, examinations of whatever kind, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Students are responsible for learning the conventions of documentation and acknowledgment of sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments of any kind according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors.

The following is a broad overview, but not an all-encompassing definition, of what constitutes a violation of academic integrity. Also, we will start each course with an Academic Integrity tool that you are required to study.

Cheating: The University defines cheating as using or attempting to use unauthorized materials, information, or study aids in any academic exercise. When completing any academic assignment, a student shall rely on his or her own mastery of the subject.

Examples include, but are not limited to:

- Unauthorized use of aids such as but not limited to notes, text, the Internet, cell phones, etc. to complete any academic assignment.
- Copying from another student's academic work.
- Unauthorized communication during an examination.
- Handing in the same paper for more than one course without explicit permission from the instructor(s).
- Intentionally viewing a test before it is administered.
- Storing notes in a portable electronic device for use during an examination.

Fabrication: The University defines fabrication as falsification, misrepresentation, or invention of any information, data, or citation in an academic exercise.

Examples include, but are not limited to:

- Inventing data, facts, or sources for an academic assignment.
- Altering the results of a lab experiment or survey.
- Citing a source in a bibliography that was not used.
- Stating an opinion as a scientifically proven fact.

Plagiarism: The University defines plagiarism as using as one's own the words, ideas, data, code, or other original academic material of another without providing proper citation or attribution. Plagiarism can apply to any assignment, either final or drafted copies, and it can occur either accidentally or deliberately. Claiming that one has "forgotten" to document ideas or material taken from another source does not exempt one from plagiarizing.

The following sources require citation:

- Word-for-word quotations from a source, including another student's work.
- Paraphrasing (using the ideas of others in your own words).
- Unusual or controversial facts not widely recognized.
- Audio, video, digital, or live exchanges of ideas, dialogue, or information.

Students unclear as to whether or not a source requires citation should speak with their professor.

Unauthorized Collaboration: The University defines unauthorized collaboration as instances when students submit individual academic works that are substantially similar to one another. While several students may have the same source material, any analysis, interpretation, or reporting of data required by an assignment must be each individual's independent work unless the instructor has explicitly granted permission for group work.

Examples include, but are not limited to:

- Submitting work that closely matches that of another student, even when the work is to be original to the student handing in the assignment.
- Sharing a take-home examination, case write-up, lab report, or any other assignment with a peer without express permission from the instructor.

Participation in Academically Dishonest Activities: The University defines participation in academically dishonest activities as any action taken by a student with the intention of gaining an unfair advantage over other students.

Examples include, but are not limited to:

- Misrepresenting oneself or one's circumstances to an instructor.
- Stealing an examination.
- Purchasing a pre-written paper.
- Selling, loaning, or otherwise distributing materials intended for the purpose of cheating, plagiarism, or other academically dishonest acts.
- Destroying, altering, stealing, or forging another student's work, library materials, laboratory materials, academic records, course syllabi, or examination/course grades.
- Intentionally missing an examination or assignment deadline to gain an unfair advantage.
- Forging information or signatures on official University documents.

Facilitating Academic Dishonesty: The University defines facilitating academic dishonesty as intentionally or knowingly helping or contributing to the violation of any provision of this policy.

Examples include, but are not limited to:

- Doing academic work for another student.
- Making available previously used academic work for another individual who intends to resubmit the work for credit.

Obligation to Uphold Academic Integrity: All members of the Northeastern University community have a role in upholding the Academic Integrity Policy. Any member of the community who witnesses a violation of this policy should report it to the appropriate faculty member or the [Office of Student](#) [Conduct and Conflict Resolution web page](#) (OSCCR).

College of Professional Studies Policies and Procedures

For comprehensive information, please see the [Registrar University Catalogs page](#) as well as the [Student Resources](#) page of the [Northeastern University College of Professional Studies](#) website.

Student Accommodations

The College of Professional Studies is committed to providing equitable access to learning opportunities to students with documented disabilities (e.g. mental health, attentional, learning, chronic health, sensory, or physical). To ensure access to this class, and program, please contact The Disability Resource Center (http://www.northeastern.edu/drc/) to engage in a confidential conversation about the process for requesting reasonable accommodations in the classroom and clinical or lab settings. Accommodations are not provided retroactively so students are encouraged to register with the Disability Resource Center (DRC) as soon as they begin their program. The College of Professional Studies encourages students to access all resources available through the DRC for consistent support.

Resources for International Students

The list below includes some resources at Northeastern University to support international students.

Global Student Success (GSS)

Website: http://www.cps.neu.edu/gss

- Global Student Success supports the success of international students at Northeastern University. GSS provides international students with high-quality language, academic and cultural support. Below are the resources that fall under GSS.

International Tutoring Center (ITC)

The ITC offers both English as a Second Language (ESL) tutoring and language and culture workshops. Services are available in-person and online.

- **ESL Tutoring:** Provides high-quality comprehensive English language and academic support for international students through 50-minute individual and group tutoring appointments. Sessions focus on areas including academic writing, listening, speaking, reading and TOEFL preparation. ITC also offers conversation tutorials on various topics.
- **Language and Culture Workshops:** The workshops cover English language skills, American culture, and general tips for academic success. There are in-person and recorded workshops.
- **Listening & Speaking Classes** – These courses offer listening and speaking practice for students to improve their pronunciation, listening comprehension and speaking skills. College of Professional Studies students register via MyNEU.

International Student & Scholar Institute (ISSI)
Website: http://www.northeastern.edu/issi

- ISSI is committed to being an active resource to the university's community of international students, scholars and their families. The staff provides professional expertise and advice to ensure that students maintain compliance through their immigration, academic and employment experiences. They also offer cultural and fun activities throughout the year to help students be more engaged with the Northeastern and broader community.

Accent & Communication Training
Website: http://www.northeastern.edu/bouve/csd/clinic/accent-and-communication-training-act/

- The Accent & Communication Training is for non-native speakers of English who want to enhance their communication skills in academic, professional, and social situations. It is offered through the Department of Speech-Language Pathology and Audiology at NORTHEASTERN UNIVERSITY'S BOUVÉ COLLEGE OF HEALTH SCIENCES.

Northeastern University Writing Center
Website: http://www.northeastern.edu/writingcenter/

- The Northeastern University Writing Center is housed in the Department of English within the COLLEGE OF SOCIAL SCIENCES AND HUMANITIES. It is open to any member of the Northeastern community and exists to help any level writer from any academic discipline.

NUCALLS
Website: http://www.nucalls.neu.edu/

- NUCALLS is a student organization at Northeastern University that is dedicated to offering free language classes to the Northeastern community. Students who are interested in improving their English language or other foreign language skills can take advantage of these resources.

End-of-Course Evaluation Surveys

Your feedback regarding your educational experience in this class is very important to the College of Professional Studies. Your comments will make a difference in the future planning and presentation of our curriculum.

At the end of this class, please take the time to complete the evaluation survey at **the NEU EvaluationKit website** . Your survey responses are **completely confidential**. Surveys will be open for the last two weeks of the class. An email will be sent to your HuskyMail account notifying you when surveys are available.

Online Proctoring

In this class, some tests may be administered remotely by an online authentication and proctoring service called Examity®, which gives you the flexibility to schedule exams at your convenience and take them wherever you want.

To prepare for using Examity®, you will need to meet the following technical requirements:

- Working webcam and microphone which can be tested at www.testmycam.net
- An Internet connection of at least 3Mbps (www.speedtest.net)
- Chrome/ Mozilla/ Safari/ Internet Explorer/ Microsoft Edge browser
- Up to date Operating system (Windows or Mac OS)

Please click on the link below to run an automated systems check:
Examity Computer Readiness Check

If you do not pass the systems check or have any questions or concerns, you can contact Examity's® technical support team 24/7 via email at support@examity.com or phone at (855) 392-6489. Please tell your instructor immediately if your computer/equipment does not meet the standard to use online proctoring.

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