**MT 121 Introduction to Statistics**

***DONNELLY COLLEGE***

Term

Day/Time

Room

3 credit hours

**INSTRUCTOR INFORMATION:**

Name:

Office:

Office hours:

Telephone:

E-mail address:

**COURSE DESCRIPTION:**

This course is designed to help the student understand statistical processes and applications. Topics include: descriptive statistics, probability, binomial and normal distributions, sampling and sampling distributions, hypothesis testing, Chi-square test, regression and correlation.

**PREREQUISITES:**

C or better in MT 103 or appropriate placement score

**REQUIRED TEXTBOOK & SUPPLIES:**

* Elementary Statistics: A Brief Version, 7th Ed, by Bluman; Publisher: McGraw-Hill Higher Education
* Graphing calculators are available for $20 rental.

**PHILOSOPHY OF GENERAL EDUCATION:**

Donnelly College has consistently maintained a strong commitment to the liberal arts and sciences as a foundation for a complete education. The faculty strongly believes that the liberal arts and sciences provide the context through which students can engage with the larger questions about students’ place in the world and their pursuit of truth. Therefore, the College’s general education requirements are designed to ensure that liberal arts and sciences graduates develop a breadth of content knowledge and the skills and abilities which will enable them to become educated participants in a diverse global community.

**DONNELLY COLLEGE LEARNING OUTCOMES:**

1. **Communication Skills:** Students will communicate effectively in writing and speaking.
2. **Technology and Information Literacy Skills:** Students will demonstrate proficiency in information literacy skills.
3. **Symbolic Problem Solving:** Students will demonstrate competency in qualitative and quantitative problem solving.
4. **Analytical Thinking:** Students will employ reflective thinking to evaluate diverse ideas in the search for truth.
5. **Personal and Interpersonal Skills:** Students will develop an understanding across cultural differences locally, nationally, and internationally.
6. **Academic Inquiry:** Students will engage independently and effectively in lifelong learning.
7. **Values:** Students will demonstrate moral and ethical behavior in keeping with our Catholic identity.

**LIBERAL ARTS AND SCIENCES PROGRAM LEARNING OUTCOMES:**

In addition to the general education learning outcomes – communication skills, technology and information literacy skills, symbolic problem solving, analytical thinking, personal and interpersonal skills, academic inquiry, and values – upon successful completion of the Associate of Arts in Liberal Arts degree, the graduate should be able to demonstrate:

1. Proficiency and creativity in written and verbal communication.

2. Effective use of current technology in support of academic work.

3. Proficient use of qualitative and quantitative methods in problem solving.

4. Critical and Analytic thinking across a range of disciplines.

5. A commitment to ethics and integrity in academic and professional relationships, within the community and the environment.

6a. The ability to conduct research using sources, strategies, and approaches across disciplines. (AA)

6b. Use of the scientific method. (AS)

**MT 121 INTRODUCTION TO STATISTICS STUDENT LEARNING OUTCOMES:**

Upon completion of MT 121 the student will have the ability to:

1. Use inferential statistics to estimate population parameter.

2. Calculate descriptive statistics using technology.

3. Use the probability distribution to solve problems.

4. Determine the probability of events.

5. Calculate correlation coefficients and regression lines.

|  |  |  |  |
| --- | --- | --- | --- |
| **Donnelly College**  **Learning Outcomes** | **Program Learning Outcomes1** | **Student Learning Outcomes2** | **Application and Assessment3** |
| Students will communicate effectively in writing and speaking. | 1. Students will demonstrate proficiency and creativity in written and verbal communication. | 1. Students will have the ability to use inferential statistics to estimate population parameter. | 1. Class average of 70% or more on an assignment. |
| Students will demonstrate proficiency in information literacy skills. | 2. Students will demonstrate effective use of current technology in support of academic work. | 2. Students will have the ability to calculate descriptive statistics using technology. |  |
| Students will demonstrate competency in qualitative and quantitative problem solving. | 3. Students will demonstrate proficient use of qualitative and quantitative methods in problem solving. | 3. Students will have the ability to use the probability distribution to solve problems.  4. Students will have the ability to determine the probability of events.  5. Students will have the ability to calculate correlation coefficients and regression lines. |  |
| Students will employ reflective thinking to evaluate diverse ideas in the search for truth. | 4. Students will demonstrate critical and analytic thinking across a range of disciplines. |  |  |
| Students will develop an understanding across cultural differences locally, nationally, and internationally. | 5. Students will demonstrate a commitment to ethics and integrity in academic and professional relationships, within the community and the environment. |  |  |
| Students will engage independently and effectively in lifelong learning. | 6b. Use of the scientific method. |  |  |
| Students will demonstrate moral and ethical behavior in keeping with our Catholic identity. |  |  |  |

**COURSE REQUIREMENTS**

|  |  |
| --- | --- |
| **Item** | **Percentage of Total Grade** |
| Homework (100pts) | 14.3% |
| Quizzes (100 pts) | 14.3% |
| Tests (4 x 100pts) | 57.1% |
| Final Exam (1 x 100pts) | 14.3% |
| **Total** | **100.0%** |

***Homework***: Each section covered will have homework assigned. The assigned homework problems together with the due dates will be posted in Canvas. Note that the total homework points are equivalent to points on one test.

***Quizzes***: There will be quizzes throughout the semester for a total of 100 points. There are **NO Make-up** for quizzes missed. ***Cell Phone calculators are not allowed.***

***Tests***: Tests will be given as is indicated in the course schedule.

***Make-up Tests***: You may make up one test. In order to be allowed to make up a test you must call or e-mail me BEFORE the start of the test. You must have a valid reason and give it at this time (“I’m not ready” is NOT a valid reason.) If you do not provide prior notice, you must provide documentation (doctor’s note, etc.) as to why you could not take the test (documentation must be provided BEFORE the test can be scheduled). Unless there are extenuating circumstances, all tests must be made up within 1 week of the scheduled test time. It is up to you to schedule the test.

***Retests***: There are no retests.

**Final Exam:** The final exam will be comprehensive.

***Additional Assistance:***

If you have questions about using Canvas, check the Online Student Guide available at [*https://community.canvaslms.com/docs/DOC-10701-canvas-student-guide-table-of-contents*](https://community.canvaslms.com/docs/DOC-10701-canvas-student-guide-table-of-contents)For any technical problems, call the assistance line at 1-855-593-5537. This line is available 24/7.

***CANVAS:****All course materials, grades, and communication with the instructor will be conducted in the Canvas online learning platform. Students are expected to check their accounts on a regular basis (i.e., 2X a week minimum).*

***Note:****All communications regarding this course will be made via your Donnelly College email account.*

**RUBRIC:** The following rubric will be used to evaluate individual problems.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **100% of assigned points** | **75% of assigned points** | **50% of assigned points** | **25% of assigned points** |
| **Interpretation**  *Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)* | Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information. *For example, accurately explains the trend data shown in a graph and makes reasonable predictions regarding what the data suggest about future events.* | Provides accurate explanations of information presented in mathematical forms. *For instance, accurately explains the trend data shown in a graph.* | Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units. *For instance, accurately explains trend data shown in a graph, but may miscalculate the slope of the trend line.* | Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means.  *For example, attempts to explain the trend data shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by confusing positive and negative trends.* |
| **Representation**  *Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)* | Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding. | Competently converts relevant information into an appropriate and desired mathematical portrayal. | Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate. | Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate. |
| **Calculation** | Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.) | Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. | Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem. | Calculations are attempted but are both unsuccessful and are not comprehensive. |
| **Application / Analysis**  *Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis* | Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work. |  | Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from this work. | Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work. |
| **Assumptions**  *Ability to make and evaluate important assumptions in estimation, modeling, and data analysis* | Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate. Shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions. | Explicitly describes assumptions and provides compelling rationale for why assumptions are appropriate. | Explicitly describes assumptions. | Attempts to describe assumptions. |
| **Communication**  *Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)* | Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality. | Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explication may be uneven. | Uses quantitative information, but does not effectively connect it to the argument or purpose of the work. | Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (May use quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.) |

**GRADING POLICY:**

Grades are awarded on the basis of the following scale:

|  |  |
| --- | --- |
| **Item** | **Points** |
| Homework | 100 |
| Quizzes | 100 |
| Tests (4 x 100pts) | 400 |
| Final Exam (1 x 100pts) | 100 |
| Total | 700 |

Letter grade will be awarded as follows:

A 630 – 700 pts

B 560 – 629 pts

C 490 – 559 pts

D 420 – 489 pts

F 0 – 419 pts

**CALCULATOR POLICY**: The use of calculators (either scientific or graphic) is allowed. Any student wishing to use a calculator must provide his/her own calculator (graphing calculators are available for a $20 rental fee). Cell phones with calculator capabilities may NOT be used on tests. Calculators may NOT be shared on tests.

**CELL PHONE POLICY**: Cell phones should be turned off (or placed on vibrate) and should be kept in your book bag or on the floor (not on the desk or in your lap) during class.

**ACADEMIC INTEGRITY:** “…Academic integrity is to be maintained at all times to insure genuine educational growth. Cheating and plagiarism in all forms, therefore, will be subject to disciplinary action. Serious infractions will be reviewed by an ad hoc committee, appointed by the appropriate dean. Appropriate sanctions will be imposed.”

**PLAGIARISM:** Plagiarism-the appropriation or imitation of the language or ideas of another person and presenting them as one’s original work-sometimes occurs through carelessness or ignorance. Students who are uncertain about proper documentation of sources should consult their instructors.

**ACCOMMODATIONS:** In compliance with the Americans with Disabilities Act, Donnelly College will make every attempt to provide equal access for persons with disabilities. Students in need of accommodations must request them in writing from the Vice President of Academic Affairs.

**CIVILITY & DECORUM:** As noted in its Code of Conduct, Donnelly College is committed to maintaining an overall atmosphere of civility and respect. Civility and decorum both inside and outside the classroom are fundamental foundations of the values at Donnelly College. Classroom discussions and interactions outside the classroom will at all times be focused on the learning process and should always be respectful of both students and faculty. In open discussions of ideas and issues, disagreements should focus on ideas and facts. Name calling and assaults (either in person or on-line) will not be tolerated. Should any problems occur, the instructor should be notified immediately. Those who do not comply with civility and decorum requirements may be subject to a grade reduction and/or other sanctions up to and including dismissal from Donnelly College.

**ATTENDANCE POLICY:** You are expected to attend each and every class. An administrative withdrawal may be initiated after four absences. The absences do not have to be consecutive.

Additionally, Donnelly College is instituting the following attendance policy; **“*All students will be asked to self-report if they must quarantine or have been exposed to COVID-19 by filling out the COVID-19 Incident Report Form”.*** Here is a link to the COVID-19 Incident Report Form: <https://forms.office.com/Pages/ResponsePage.aspx?id=S_8IWW-rUkmWHLbDxQ34Kzw0_67sUS1Ov9jbznJoRWBUNVU2UzhPR0tUREZRQUdHME9aVDY1NzRBVi4u>

**Assigned Seating: Due to COVID-19 you will be assigned a seat in the classroom.** This will assist in contact tracing if the need should arise.

**WITHDRAWAL FROM COURSES OR FROM SCHOOL:** It is the responsibility of the student to withdraw from class. If a student decides to withdraw from a class, ideally, they should see an advisor and the financial aid staff before taking the withdrawal form to the Registrar's office for processing.  However, any verifiable contact (e-mail, fax, phone, mail, etc.) with authorized college personnel expressing the student's intent to withdraw from a class will be honored.

If students withdraw before they have earned their financial aid, they will owe Donnelly College a debt for the unearned portion of the financial aid as well as for any unpaid balances (subject to the College's refund policy). Not attending class is not a withdrawal from class.

**Donnelly College reserves the right to withdraw a student from class(es) if the student does not meet their financial obligations, including two missing or incomplete payments, or loss of financial aid.** Faculty may initiate an administrative withdrawal on the basis of non-attendance. In extreme circumstances (i.e. a disciplinary problem), the Vice President of Academic Affairs may initiate an administrative withdrawal. The student remains responsible for the tuition owed in this instance.

The deadlines for withdrawing from classes are as follows:

|  |  |
| --- | --- |
| 14 to 16 weeks | 3 weeks before the end of the class |
| 6 to 8 weeks | 7 weekdays before the end of class |
| 4 to 5 weeks | 4 weekdays before the end of class |
| Less than 4 weeks | Withdrawals are not allowed |

Withdrawal deadline dates will be published in the academic calendar.

**COVID-19 POLICY:**

Students will be assigned specific seats in the classroom. This will assist in contact tracing should need arise. These will be in effect throughout the semester. Cleaning wipes to wipe off spaces will be provided. Students are required to read and agree to the ‘Good Faith Agreement’ below.

***COVID-19***

Due to the COVID-19 pandemic Donnelly college has instituted several measures for your safety.

The Donnelly college website has an update center. Here is a link to the Donnelly College COVID information: <https://www.donnelly.edu/updates>

All students will read and sign the following Good Faith Agreement; ***“I pledge to monitor myself for the symptoms of COVID-19 and to observe the 3 “Ws” while on campus: Wash my hands, watch my distance and wear a mask. I will look out for others and encourage them to stay committed to keeping everyone healthy and I will participate in contact tracing to preserve the wellness of the Donnelly Community.”***

Additionally, Donnelly College is instituting the following attendance policy; **“*All students will be asked to self-report if they must quarantine or have been exposed to COVID-19 by filling out the COVID-19 Incident Report Form”.*** Here is a link to the COVID-19 Incident Report Form: <https://forms.office.com/Pages/ResponsePage.aspx?id=S_8IWW-rUkmWHLbDxQ34Kzw0_67sUS1Ov9jbznJoRWBUNVU2UzhPR0tUREZRQUdHME9aVDY1NzRBVi4u>

I have read and agree to the ‘Good Faith Agreement’ above.

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Printed Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**MT 121A Introduction to Statistics**

Fall 2021 Tentative Course Schedule

# This schedule is subject to change based on the progress or needs of the class.

| **Week** | **Topic / Section** | **Homework** |
| --- | --- | --- |
| 1 | Syllabus  1. Nature of probability & statistics | Posted in Canvas |
| 2 | 2. Frequency distributions and graphs |
| 3 | 3. Data Description |
| 4 | Review  **Test #1** |
| 5 | 4. Probability and counting rules |
| 6 | 5. Discrete Probability Distributions |
| 7 | Review  **Test #2** |
| 8 | 6. The Normal distribution |
| 9 | 7.Confidence Intervals and sample size |
| 10 | Review  **Test #3** |
| 11 | 8.Hypothesis Testing |
| 12 | 9.Testing the difference between two means, proportions, and variances |
| 13 | Review  **Test #4** |
| 14 | 10. Correlation and Regression |
| 15 | 11. Chi-Square and analysis of variance |
| **Thanksgiving Day** |
| 16 | 11. Chi-Square and analysis of variance (Cont.)  Review |  |
| 17 | **Study day** |  |
| **Comprehensive Final** |  |