MATH 2021 Fundamentals of Statistics
Yearlong 2018- 2019

Jeff Snider – 7th Period
Hayfield HS - Room 11
jsnider@hayfield.k12.mn.us

Introduction:

This course is a Riverland Community College course taught concurrently with your Hayfield High School class. You will earn college credits and your grade help build your college transcript. You will also be earning high school credit and grade concurrently.

Course Description

This course is an introduction of basic statistical methods including sampling, analyzing a research study, measures of central tendency and dispersion, probability, confidence intervals, hypothesis testing of means and proportions, Chi-square, analysis of variance, correlation, and regression. (4 Credits - 4 lecture, 0 lab).

*MnTC Discipline: Mathematical/Logical Reasoning **Core Theme: Critical Thinking

Required Texts/Materials/Supplies:

Beginning Statistics (2nd Edition)
By Carolyn Warren, Kim Denley, Emily Atchley
Electronic Edition: 1008 pages
- **Publisher:** Hawkes Learning; 2nd edition (2017)
- **Language:** English
- **ISBN-10:** 1932628673
- **ISBN-13:** 978-1932628678

Additional Supplemental Materials needed/provided
Graphing Calculator Application – Desmos
Microsoft Excel

iPad/Computer

College-Wide Learning Outcomes:

Quantitative Reasoning

- o Students can reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations.

- o Students can understand, analyze, create, and communicate arguments supported by quantitative evidence.

- o Students can understand and apply basic analytic-mathematical operations into make logical inferences from quantitative data.

Course-Specific Learning Outcomes:

Upon successful completion of MATH 2021, students will demonstrate knowledge of:

A. Introduction to Statistics
   - o Definitions and data classification
   - o Types of studies and types of samples
   - o Critiquing a published study

B. Graphical displays of data
   - o Frequency distributions
   - o Graphical displays of data
   - o Analyzing graphs

C. Numerical descriptions of data
   - o Measures of center
   - o Measures of dispersion
   - o Measures of relative position

D. Probability and randomness
   - o Introduction to probability
   - o Additional rules for probability (optional)

E. Discrete probability distributions
   - o Discrete random variables
   - o Binomial distribution

F. Normal probability distributions
   - o Introduction to the normal distribution
   - o Finding area/probability under a normal distribution
   - o Central limit theorem with means

    o Central limit theorem with proportions

  G. Confidence intervals
    o Estimating population means
    o Estimating population proportions
    o Estimating population variances (optional)

  H. Hypothesis testing
    o Fundamentals of hypothesis testing
    o Testing a population mean
    o Testing a population proportion
    o Testing a population variance (optional)
    o Chi-Square Test
    o Testing two population means
    o Testing two population proportions
    o ANOVA

  I. Correlation and regression
    o Scatter plots and correlation
    o Linear regression

Course Purpose/Objectives (MN Transfer Curriculum/General Education Goal Area):

GOALS	OBJECTIVES Students will be able to	OUTCOMES The student will successfully
MnTC Goal 4b	clearly express mathematical/logical ideas in writing.	1. interpret results of hypothesis tests and state conclusions based on analysis 2. apply critical evaluating questions to critique research
MnTC Goal 4c	explain what constitutes a valid mathematical/logical argument (proof).	1. explain how decision was made to reject/fail to reject null hypothesis and state the practical application of this decision.
MnTC Goal 4d	apply higher-order problem-solving and/or modeling strategies.	1. determine a linear model for a given situation and interpret its meaning
MnTC Goal 2a	gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and conscious of possible bias in the information selected.	1. calculate measures of center and measures of dispersion with respect to a given dataset 2. calculate probabilities using basic probability rules 3. calculate probabilities using a Normal Distribution and/or Central Limit Theorem

MnTC Goal 2b	imagine and seek out a variety of possible goals, assumptions, interpretations, or perspectives which can give alternative meanings to solutions to given situations or problems.	1. determine which test statistic should be used, verify assumptions, and calculate the appropriate confidence interval
MnTC Goal 2d	recognize and articulate the value assumptions which underlie and affect decisions, interpretations, analyses, and evaluations made by ourselves and others.	1. apply critical evaluating questions to critique research

Grading Criteria/Course Evaluation:

100-94%	A	83-80%	B-	69-67%	D+
93-90%	A-	79-77%	C+	66-64%	D
89-87%	B+	76-74%	C	63-60%	D-
86-84%	B	73-70%	C-	59-0%	F

90% Summative Assessment

Unit Assessments: Will be taken electronically and feedback will be provided promptly.

Final Assessment: Will be valued at 20%

Projects: Completed periodically throughout the course.

10% Formative Assessment

Quizzes: Given periodically each chapter to formally assess your progress and provide prompt independent feedback to enhance learning.

Homework: Given with each lesson and **due** the next class period. Immediate feedback will be provided and Homework for the chapter will approximately be the value of a quiz.

Student Requirements:

1. Be on time to class.
2. Come to class prepared with all required materials.
3. During class discussion, respect your peers and teacher by listening while others are talking. Please raise your hand to speak when appropriate.
4. Be a responsible student and a positive participant in class.
5. Respect your classmates and give them your attention because they probably have the same questions as you.

Making up Work

- It is the student's responsibility to check for missed assignments/quizzes/tests.
- Quizzes/Tests must be made up within one week.
- Homework must be made up before the unit is completed.
- Please consult the Moodle to find out what you missed

Extra Help:

Students are encouraged to come in for extra help during my planning period, 4th. I plan to be in my room by 7:30 daily to assist students, but I will also need a few minutes of that time to get things ready for the day's lessons. Please come and visit if you are having any problems. If these times don't work well, please feel free to ask other math teachers, consult the internet, or set up an appointment with me if you have questions.

ADA Statement:

Upon request, this information will be made available in alternative formats such as braille, large print, or audio by calling 507-433-0600 (TDD 800-627-3529).

Academic Integrity Statement:
Academic integrity is essential to a positive teaching and learning environment. In addition to Hayfield Community Schools District Policy 506, students enrolled in a RivCEP course are expected to complete course work responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else's work as their own will result in disciplinary action. The Student Code of Conduct defines Cheating: Includes, but is not limited to: (1) use of any unauthorized assistance in taking quizzes, tests, assessments, or examinations; (2) use of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (3) the acquisition, without permission, of tests or other academic material belonging to a member of the faculty or staff; (4) engaging in any behavior specifically prohibited by a faculty member in the course syllabus or class discussion. Plagiarism: Includes, but is not limited to, the use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of terms papers or other academic materials. For the complete Student Code of Conduct, visit http://www.riverland.edu/policies/Student-CodeConduct.cfm

Affirmative Action Statement:

Riverland Community College is an equal opportunity employer and educator.
http://www.riverland.edu/policy/Equal-Opportunity-Nondiscrimination-Policy-1000.pdf

Emergency Procedures:

Contact the Hayfield High School office and/or email your instructor: jsnider@hayfield.k12.mn.us

If you have a disability and need accommodations to participate in this course, please contact your instructor as soon as possible. Course requirements and schedule are subject to change at the instructor's discretion.

Course Coding Information:

Course Code A/Class Maximum 48; Letter Grade
Revision date: 9/1/16
AASC Approval date: 9/20/16

*Riverland Community College Disciplines	MnTC Goal Number
Communication (CM)	1
Natural Sciences (NS)	3
Mathematics/Logical Reasoning (MA)	4
History and the Social & Behavioral Sciences (SS)	5
Humanities and Fine Arts (HU)	6

**Riverland Community College Core Themes	MnTC Goal Number
Critical Thinking (CT)	2
Human Diversity (HD)	7
Global Perspective (GP)	8
Ethical and Civic Responsibility (EC)	9
People and the Environment (PE)	10

*These five MnTC Goals have been identified as Riverland Community College Disciplines. ** These five MnTC Goals have been identified as Riverland Community College Core Themes. NOTE: The Minnesota Transfer Curriculum "10 Goal Areas of Emphasis" are reflected in the five required discipline areas and five core themes noted in the Riverland Community College program of study guide and/or college catalog.