Course: HI450 Healthcare Data Reporting and Analysis
Credit: 4 Quarter Hours   **Method of Delivery:** eLearning

Course Description: This course applies statistical terms, definitions, and healthcare-specific statistical formulae (census data, percent of occupancy, miscellaneous rates, length of stay, etc.). Collection, measurement, statistical analysis, and presentation techniques will be examined as they pertain to research in healthcare.

Prerequisite: MAT140

Text(s) & Manual(s): Calculating and Reporting Healthcare Statistics, Fifth Edition
Author(s): Loretta A. Horton, Med, RHIA, FAHIMA
Publisher: AHIMA Press

Text(s) & Manual(s): A Practical Approach to Analyzing Healthcare Data, Third Edition
Author(s): Susan White, PhD, RHIA, CHDA
Publisher: AHIMA Press

Materials needed for this course:
    Additional Supplies:
    Hardware/Software and Equipment:

Topics:
1. Introduction to Health Statistics
2. Mathematics Review
3. Patient Census
4. Percentage of Occupancy
5. Length of Stay
6. Death (Mortality) Rates
7. Hospital Autopsies and Autopsy Rates
8. Morbidity and Other Miscellaneous Rates
9. Statistics Computed within the Health Information Management Department
10. Descriptive Statistics in Healthcare
11. Presentation of Data
12. Basic Research Principles
13. Inferential Statistics in Healthcare
14. Data Analytics
15. Introduction to Data Analysis
16. Data in Healthcare
17. Tools for Data Organization, Analysis, and Presentation
18. Analyzing Categorical Variables
19. Analyzing Continuous Variables
20. Analyzing the Relationship between Two Variables
21. Study Design and Sample Selection
22. Exploratory Data Applications
23. Benchmarking and Analyzing Externally Reported Data

Learning Objectives: Upon completion of this course, the student will be able to:
1. Calculate healthcare-specific statistics.
2. Evaluate data from varying sources to create meaningful presentations.
3. Interpret inferential statistics.
4. Analyze statistical data for decision-making.

AHIMA Baccalaureate Entry Level Competencies (2014)
I.D.5. Evaluate data from varying sources to create meaningful presentations.
III.C.2. Apply data extraction methodologies.
III.C.4. Analyze clinical data to identify trends that demonstrate quality, safety, and effectiveness of healthcare.
III.D.1. Interpret inferential statistics.
III.D.2. Analyze statistical data for decision making.

Midstate Grading scale:

90 - 100   A
80 - 89   B
70 - 79   C
60 - 69   D
 0 - 59   F

Midstate Plagiarism Policy:
Plagiarism is using another person's words, either by paraphrase or direct quotation, without giving credit to the author(s). Plagiarism can also consist of cutting and pasting material from electronic sources by submitting all or a portion of work for assignment credit. This includes papers, computer programs, music, sculptures, paintings, photographs, etc. authored by another person without explicitly citing the original source(s). These actions violate the trust and honesty expected in academic work. Plagiarism is strictly against the academic policy of Midstate College. Its seriousness requires a measured, forceful response which includes consequences for inappropriate and/or no citation.

In courses containing writing assignments, the College promotes the use of an electronic resource which compares the student's writing against previously submitted papers, journals, periodicals, books, and web pages. Students and instructors can use this service to reduce the incidence of plagiarism. This electronic resource has been found to conform to legal requirements for fair use and student confidentiality. It is able to provide a report to the student indicating the parts of the assignment that match.

Student Success:
The Office of Student Success is available to students seeking tutoring for individual classes or who need assistance with writing assignments. Information is also available on test taking techniques, how to take notes, developing good study skills, etc. Contact Student Success in Room 110 (in person); (309) 692-4092, extension 1100 (phone); studentsuccess@midstate.edu (email).

Instructor: Leah A. Grebner, PhD, RHIA, CCS, FAHIMA   **Room/phone:** 234/309-692-4092
Midstate email: lgrebner@midstate.edu   **Office Hours:** posted

Instructor: Cindy Heskett, RHIT, CCS   **Room/phone:** 236/309-692-4092
Midstate email: csheskett@midstate.edu   **Office Hours:** Posted

Policies and Procedures:

1. All work is to be submitted on time unless unusual circumstances occur. If you miss class, you are expected to use your course outline to determine what you missed. You will have seven days to make arrangements to make up the missed work without penalty. The grade will drop 10% for each week you delay in completing material following the seven day grace period. ___Late work will NOT be accepted without prior approval from the instructor.___ This includes homework and quizzes.
2. ___Academic dishonesty is never tolerated and will be referred to the dean___.
3. The final exam ___must___ be completed. Failure to do so will result in failure of the course.
4. In order to maintain equal work in both online and classroom components of this course, __all__ students, both classroom and eLearning, must complete weekly reflections.
5. Discussion responses must be posted by Sunday night at the end of the week. In order to receive full credit for online discussion, you must also respond to at least one other student in a *meaningful* manner with either a value-added comment or an insightful question about the posting of your classmate.
6. ___Attendance is expected, not suggested.___ Class is like having a job. Excessive absence will hurt your performance and your ability to pass this class. Excessive absence is 3 or more weeks of online classes.
7. Academic integrity is important at Midstate College, as stated in the catalog and student handbook. This not only includes prevention of cheating on exams and written research papers, but also discussion forum postings. **Discussion postings must be in your own words and references must be cited.**
8. The policy for eLearning is that course materials are available to students at noon each Monday and that students have until 7:59 a.m. Monday morning to complete the previous week's material. However, students are advised against waiting until the last minute or last day to submit their work for a variety of reasons. If you work on your eLearning course early in the week and experience computer problems, you have more time to find an alternate computer. Also, the discussion forums can be very beneficial learning tools in eLearning if utilized to their greatest potential. It is difficult to have an effective and meaningful "discussion" if nobody posts until the last minute.

Examination Information: There will be a total of 11 quizzes over the course of Weeks 1-11 and a comprehensive final examination in Week 12.

Methods of evaluating student performance: All assignments, projects, quizzes, assessment items, and the final examination must be completed. If all required elements are not done, the student will not pass this course. A course average of C or better is required to be considered passing for this course.

Discussions	25%
Weekly Reflections	20%
Assignments	25%
Quizzes & Final Exam	30%
Total	100%

ELEARNING DISCUSSION QUESTION GRADING GUIDELINES	
Initial posting • Answers the minimal requirements of the question without supporting evidence = 10 point • Minimal posting with supporting evidence = 20 points • Complete posting with supporting evidence = 30 points	30 points
Response to posting of a classmate • Posting the minimal requirements without supporting evidence = 10 points • Minimal posting with supporting evidence = 20 points • Complete posting with supporting evidence = 30 points	30 points
Correct spelling in postings for the week • No spelling errors = 20 points • One or two spelling errors = 10 points • More than two spelling errors = 0 points	20 points
Correct grammar in postings for the week • No grammar errors = 20 points • One or two grammar errors = 10 points • More than two grammar errors = 0 points	20 points
Total points per weekly discussion	100 points

WEEKLY REFLECTION GRADING GUIDELINES	
• Two complete paragraphs with supporting evidence = 40 points • One paragraph with supporting evidence or two minimal paragraphs without supporting evidence = 20 points • Answers the minimal requirements of the question without supporting evidence = 10 points • No posting = no points	40 points
Correct spelling in postings for the week • No spelling errors = 30 points • 1 misspelled word = 20 points • 2-3 misspelled words = 10 point • More than 3 misspelled words = 0 points	30 points
Correct grammar in postings for the week • No grammar/mechanical errors = 30 points • 1 grammar/mechanical error = 20 points • 2-3 grammar/mechanical errors = 10 points • More than 3 misspelled words = 0 points	30 points
Total points per weekly discussion	100 points

WRITING ASSIGNMENT GRADING GUIDELINES			
	-20	**-10**	**-0**
Introduction	Does not state objectives clearly	States objectives clearly, plus includes thesis statement	Also includes necessary info for reader's understanding of topic
Paragraph Development	Paragraphs are not well developed, not using minimum number of sentences nor complex sentences	Paragraphs are somewhat developed, using simple sentences, and with the minimum number of sentences	Paragraphs are fully developed, using multiple, complex and compound sentences
Content	Does not cover content appropriately	Major areas of content are included, but lacking sufficient detail	All pertinent content is covered
Mechanics	More than 3 errors	Between 1-3 errors	No errors
Spelling	More than 3 misspelled words	Between 1-3 misspelled words	No misspelled words

Week	Horton Text Chapter/Topic	White Text Chapter/Topic
1	1 - Introduction to Health Statistics 2 - Mathematics Review	
2	11 - Presentation of Data	3 - Tools for Data Organization, Analysis, and Presentation
3	3 - Patient Census 4 - Percentage of Occupancy 5 - Length of Stay	
4	6 - Death (Mortality) Rates 7 - Hospital Autopsies and Autopsy Rates 8 - Morbidity and Other Miscellaneous Rates	
5	14 - Data Analytics	1 - Introduction to Data Analysis 2 - Data in Healthcare
6	9 - Statistics Computed within the Health Information Management Department	8 - Exploratory Data Applications
7	10 - Descriptive Statistics in Healthcare	4 - Analyzing Categorical Variables
8	13 - Inferential Statistics in Healthcare	5 - Analyzing Continuous Variables
9		6 - Analyzing the Relationship between Two Variables
10		9 - Benchmarking and Analyzing Externally Reported Data
11	12 - Basic Research Principles	7 - Study Design and Sample Selection
12	Final Exam	

Week-by-Week:

Week One
Topics:
1. **Introduction to Health Statistics**
2. **Mathematics Review**

Objectives:
Upon completion of this week's assignments, the student will be able to:
1. Explain what statistic are and identify reasons to study healthcare statistics.
2. Identify sources of data.
3. Convert fractions and decimals to percentages.
4. Compute the average of a group of numbers.

Assignments:
1. **Read:** Horton text chapters 1 and 2.
2. Listen to the recorded lecture.
3. **Discussion 1:** The first discussion shall consist of two paragraphs. The first paragraph will simply be an introduction of you. Please include your name, major and any professional or personal information that you wish to share. The second paragraph should address backup plans. Since this class requires an online component, it is important to have access to a reliable computer. What is your backup plan in the event that you experience computer or internet access problems?
4. **Discussion 2:** Use the Internet to locate the Department of Vital Statistics in your state to determine what information they collect and maintain.
5. **Homework:**
   - Horton text Review exercises 1-15 on pages 27-30
6. **Quiz:** Complete week 1 quiz.
7. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Two
Topics:
1. **Presentation of Data**
2. **Tools for Data Organization, Analysis, and Presentation**

Objectives:
Upon completion of this week's assignments, the student will be able to:
1. Create tables and graphs to display statistical information.
2. Prepare the basic elements of a report.

Assignments:
1. **Read:**
   - Horton text chapter 11
   - White text chapter 3
2. Listen to the recorded lecture.
3. **Discussion:** Do an Internet search for positions that involve data analytics in HIM. What skills do you feel that you need to develop or improve if you were interested in pursuing a position in HIM data analytics.

4. **Homework:**
   - Horton text Exercises 11.2 - 11.8
   - Horton text Review exercises 1-15 on pages 278-281
   - White text chapter 3 Review exercises 1-10 on pages 58-60
   - White text online Lab 3.1:
     - Create a Data Dictionary 1 & 2
5. **Quiz:** Complete week2 quiz.
6. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Three
Topics:
1. **Patient Census**
2. **Percentage of Occupancy**
3. **Length of Stay**

Objectives:
Upon completion of this week's assignments, the student will be able to:
1. Compute daily census and inpatient service days using admission and discharge data.
2. Calculate percentage of occupancy for a variety of scenarios.
3. Compute length of stay and average length of stay.

Assignments:
1. **Read:** Horton chapters 3, 4, and 5.
2. Listen to the recorded lecture.
3. **Discussion:** Look for articles on the AHRQ website and discuss why the length of stay in inpatient facilities is dropping and what is causing it to drop. Be sure to cite the article(s) you are referencing.
4. **Homework:**
   - Horton text Exercises 3.2, 3.4, 3.6, 3.8, and 3.10
   - Horton text Exercises 4.2, 4.4, and 4.6
   - Horton text Exercises 5.2, 5.4, 5.6, and 5.8
5. **Quiz:** Complete week 3 quiz.
6. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Four
Topics:
1. **Death (Mortality) Rates**
2. **Hospital Autopsies and Autopsy Rates**
3. **Morbidity and Other Miscellaneous Rates**

Objectives:
Upon completion of this week's assignments, the student will be able to:

1. Calculate the following death rates: hospital, gross, net, postoperative, anesthesia, postoperative, maternal, newborn, and fetal, cancer, crude and case fatality rate.
2. Calculate the following autopsy rates: gross, net, adjusted hospital, newborn, and fetal.
3. Make calculations based on morbidity, infection, post-operative infection, complication, consultation, readmission.

Assignments:
1. **Read:** Horton Chapters 6, 7, and 8
2. Listen to the recorded lecture.
3. **Discussion:** Go to the Centers for Disease Control and Prevention website and research articles on death rates, autopsy rates, and infection rates. Choose an article and provide a summary in the discussion forum. Be sure to cite the article.
4. **Homework:**
    *   Horton text Exercises 6.2, 6.4, 6.6, 6.8, 6.10, 6.12, 6.14, 6.16, and 6.18
    *   Horton text Exercises 7.2, 7.4, 7.6, 7.8, 7.10, 7.12, and 7.14
    *   Horton text Exercises 8.2, 8.4, 8.6, 8.8, 8.10, 8.12, 8.14, and 8.16
5. **Quiz:** Complete week four quiz.
6. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Five
Topics:
1. **Data Analytics**
2. **Data in Healthcare**

Objectives:
Upon completion of this week's assignments, the student will be able to:
1. Compare and contrast among the three type of data analytics
2. Determine how data analytics is used in making healthcare decisions

Assignments:
1. **Read:**
    *   Horton Chapter 14
    *   White Chapters 1 and 2
2. Listen to the recorded lecture.
3. **Discussion:** Explore a variety of job search websites and identify job titles similar to health data analyst (health informatics, claims data analysis) that require a health information management degree. What are the educational, credential, and skill requirements, and what job settings (provider, insurance, consulting, etc.) did you find? How might you best prepare yourself for a job as a health data analyst?
4. **Homework:**
    *   View the website https://analytics.usa.gov and write at least one substantial paragraph of what information is being collected and how it could potentially be used. Be sure to address the impact on the role of the HIM professional. What kind of healthcare decisions are made based on the data you found?
    *   White text chapter 1 Review questions 1-10
    *   White text chapter 2 Review questions 1-10
    *   White text online resources Lab 2.2 question 1
5. **Quiz:** Complete week 5 quiz.

6. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Six
Topics:
1. **Statistics Computed Within the Health Information Management Department**
2. **Exploratory Data Applications**

Objectives:
Upon completion of this week's assignments, the student will be able to:
1. Determine the uses that statistics play in the health information management (HIM) department in terms of unit labor cost, productivity, staffing levels, budgets, and physician profiling.
2. Calculate common statistics used in the management of an HIM department.

Assignments:
1. **Read:**
   - Horton Chapter 9
   - White Chapter 8
2. Listen to the recorded lecture.
3. **Discussion:** Research a management topic that you are interested in and incorporate how you could use statistics to help make management decisions.
4. **Homework:**
   - Horton text Exercises 9.2, 9.4, 9.6, 9.8, 9.10, 9.12, and 9.13
   - White text chapter 8 Review questions 1-10
5. **Quiz:** Complete week 6 quiz.
6. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Seven
Topics:
1. **Descriptive Statistics in Healthcare**
2. **Analyzing Categorical Variables**

Objectives:
Upon completion of this week's assignments, the student will be able to:
1. Compute the percentile from an ungrouped distribution
2. Differentiate among range, variance, and standard deviation
3. Calculate range, variance, standard deviation, and correlation

Assignments:
1. **Read:**
   - Horton Chapter 10
   - White Chapter 4
2. Listen to the recorded lecture.

3. **Discussion:** Review available statistics at the Centers for Disease Control and Prevention site. There are numerous articles that use descriptive statistics. Choose an article and discuss your findings. Be sure to cite your source(s).
4. **Homework:**
   - Horton text Exercises 10.2, 10.4,
   - Horton text chapter 10 Review questions 2, 4, 6, 8, 10, and 14
   - White text chapter 4 Review questions 1-10
5. **Quiz:** Complete week 7 quiz.
6. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Eight
Topics:
1. **Inferential Statistics in Healthcare**
2. **Analyzing Continuous Variables**

Objectives:
Upon completion of this week's assignments, the student will be able to:
1. Compare and contrast descriptive and inferential statistics
2. Interpret the standard error of the mean and confidence intervals
3. Create a null hypothesis

Assignments:
1. **Read:**
   a. Horton Chapter 13
   b. White Chapter 5
2. Listen to the recorded lecture.
3. **Discussion:** Perform a search of the AHIMA Body of Knowledge to determine what types of research have been done in health information. Report on a research project that you read about that uses inferential statistics. Be sure to cite your source(s).
4. **Homework:**
   - Horton text Exercises 13.1, 13.2, 13.3, and 13.4
   - Horton text Review questions 6, 8, 10, 12, and 14
   - White text chapter 5 Review questions 1-10
   - White text online Lab 5.1 – Descriptive Statistics Using Excel – Central Tendency
5. **Quiz:** Complete week 8 quiz.
6. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Nine
Topics:
1. **Analyzing the Relationship between Two Variables**

Objectives:
Upon completion of this week's assignments, the student will be able to:

1. Compare uses for statistical tests that analyze the relationship between two variables.
2. Interpret statistical relationships between two variables.

Assignments:
1. **Read:** White Chapter 6
2. Listen to the recorded lecture.
3. **Discussion:** Discuss situations in which you might use the statistical tests presented in chapter 6.
4. **Homework:**
   - White text chapter 6 Review questions 1-10
5. **Quiz:** Complete week 9 quiz.
6. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Ten
Topics:
1. **Benchmarking and Analyzing Externally Reported Data**

Objectives:
Upon completion of this week's assignments, the student will be able to:
1. Explore benchmark data used in healthcare.
2. Compare organizations that provide benchmark data used by HIM professionals.

Assignments:
1. **Read:** White Chapter 9
2. Listen to the recorded lecture.
3. **Discussion:** Perform an internet search to find healthcare-related benchmark data. Discuss how you might use this data as an HIM professional.
4. **Homework:**
   - White text chapter 9 Review questions 1-10
5. **No quiz this week!**
6. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Eleven
Topics:
1. **Basic Research Principles**
2. **Study Design and Sample Selection**

Objectives:
Upon completion of this week's assignments, the student will be able to:
1. Compare and contrast the difference between quantitative and qualitative research
2. Differentiate among the types of research, research methods, samples, data collection techniques, and data interpretation issues
3. Determine the steps in the research process

4. Explain the role of the Institutional Review Board (IRB) in research in healthcare facilities

Assignments:
1. **Read:**
   - Horton Chapter 12
   - White Chapter 7
2. Listen to the recorded lecture.
3. **Discussion:** Perform a search of the AHIMA Body of Knowledge to determine what types of research has been done in health information management. Share a research project that you read about. Be sure to cite your sources.
4. **Homework:**
   - Select a topic that you think would be interesting or useful to research. Perform a literature review to see what research has previously been performed on the topic. Develop a hypothesis statement, determine the type of data collection, and describe the population that would be studied.
5. **Quiz:** Complete the week 11 quiz.
6. **Weekly Reflection:** Each student must submit a 2-3 paragraph report to the Weekly Reflection drop box. The report shall summarize the learning concepts from the material covered in the lecture and reading assignments. Please devote the last paragraph to two concepts that you found to be most personally important and/or valuable from this week's course material. Also, share information regarding anything that you are having difficulty understanding or any concerns that you may have this week. The weekly reflection is due by Monday at 8:00 AM.

Week Twelve
Topics:
   1. Final Exam

Objectives:
Upon completion of this week's assignments, the student will be able to:
1. Complete the final exam
2. Summarize the learning experience from this quarter.

Assignments:
1. Complete the final exam.
2. Complete the course evaluation.
3. **Final Course Reflection:** Each student must submit a 2-3 paragraph report to the Final Weekly Reflection drop box. Please devote one paragraph each to two concepts that you found most personally important and/or valuable from this quarter. In the third paragraph, please share information regarding what you liked best about the course, what you liked least about the course and any comments or suggestions for improvement. The weekly reflection is due by Monday at 8:00 AM.