

**Online Course & Title:** HIM 430-Health Data Management and Analytics

**Instructor:** Darnez Pope, MSHI, RHIT

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**Phone:** 270-745-6561

**Office Location:** Academic Complex, 411 E

**Office Hours:** Tuesdays and Wednesdays (10:30am-1:30pm); by appointment as well.

**Contact Information:**

The *best way* to contact me is either through email at [darnez.pope@wku.edu](mailto:darnez.pope@wku.edu) or during my posted office hours. My office hours are posted under "Instructor Information" on Blackboard. If contacting me by email, I will make every effort to respond within 24 hours during the week and 48 hours during the weekend.

**Blackboard Help/WKU IT Help Desk:** 270-745-7000

**Credit Hours:** Three semester hours

**Prerequisites:**

HIM 330 and one of the following: HIM 230, HCA 446 and 447, CIT 350, BDAN 330, or INS 272C

**Course Description:**

Acquisition, analysis, display, interpretation, reporting, transformation, and management of healthcare data to respond to needs, trends, and changes in clinical practice, management, healthcare quality, regulations, legislation, accrediting bodies and marketplace.

**Course Textbook (required):**

White, Susan. A Practical Approach to: Analyzing Healthcare Data, American Health Information Management Association Press, 2016, 3<sup>rd</sup> edition.  
Paperback ISBN: 9781584265276

**Other Items Needed:**

- A computer with a reliable internet connection-not a tablet or not a phone
- Microsoft Word or word processing software
- Excel software
- Adobe Acrobat Reader(a free download from Adobe.com)

**Additional Course Resources:**

- AHIMA Body of Knowledge
- Educational Perspectives in Health Informatics and Information Management
- Perspectives in Health Information Management
- U.S. Department of Health and Human Services website
- Library Resources: Library Resources for Health Information
  - CINAHL (EBSCOhost)
  - Academic Search Premier (EBSCOhost)
- Other reviews, as assigned

**Course Communication Tools:**

- Email (Use the following format when emailing the instructor---Subject Line: HIM430-Your Name-Topic)
- Blackboard Collaborate (also known as Bb Collaborate or Web Meeting)
- Students should check their WKU email accounts and the Blackboard Announcements at least weekly

**The following grading system will be used to determine final grades:**

Quizzes/Tests (Chapter Review Quizzes and Exams)	50%
Assignments (Labs, Discussion Boards, and etc.,)	50%

100% - 90%	A
89% - 80%	B
79% - 70%	C
69% - 60%	D
59% - 50%	F

**Attendance Policy:**

Students are expected to access the course site weekly. Online attendance is monitored.

**Due Dates:**

- Students will receive grades of "0" for any assignment, exam, quiz, or test that is not submitted by the scheduled due date.
- Students are expected to complete all graded work by due date.
- On Thursdays by midnight (by 11:59pm CST) is the due date.
- The end of course date is **December 13<sup>th</sup>, 2018.**

### **Title IX Misconduct/Assault Statement:**

Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) at <https://wku.edu/eoo/documents/titleix/wkutitleixpolicyandgrievanceprocedure.pdf> and

Discrimination and Harassment Policy (#0.2040) at [https://wku.edu/policies/hr\\_policies/2040\\_discrimination\\_harassment\\_policy.pdf](https://wku.edu/policies/hr_policies/2040_discrimination_harassment_policy.pdf).

Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121.

Please note that while you may report an incident of sex/gender based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the

University and **MUST** report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.

### **ADA Accommodation Statement:**

In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at [sarc.connect@wku.edu](mailto:sarc.connect@wku.edu). Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

### **Syllabus Changes:**

Class and exam schedule are subject to change.

### **Class Schedule:**

WEEK	TOPIC	ASSIGNMENT & DUE DATE
Week 1	Orientation	-Course Orientation -Read Article: <i>Data Analytics and Informatics are Two Separate Disciplines</i> Due on August 30 <sup>th</sup> at/by 11:59pm
Week 2	Introduction to Data Analysis and Data in Healthcare	-Read Ch.1 and Complete Ch.1 Review Questions -Read Ch.2 and Complete Ch.2 Review Questions -Complete Lab 2.2 Due on September 6 <sup>th</sup> at/by 11:59pm

<b>WEEK</b>	<b>TOPIC</b>	<b>ASSIGNMENT &amp; DUE DATE</b>
Week 3	Tools for Data Organization, Analysis, and Preparation	-Read Ch.3 and Complete Ch.3 Review Questions -Complete Lab 3.1 Due on September 13 <sup>th</sup> at/by 11:59pm
Week 4	Analyzing Categorical Variables	-Read Ch.4 and Complete Ch.4 Review Questions Due on September 20 <sup>th</sup> at/by 11:59pm
Week 5	Analyzing Categorical Variables	-Complete Lab 4.1 Due on September 27 <sup>th</sup> at/by 11:59pm
Week 6	Mid-Term Review	-Review Chapters 1-4 for Mid-Term Exam Due on October 4 <sup>th</sup> at/by 11:59pm
Week 7	Mid-Term Week	-Complete Mid-Term Exam (Chapters 1-4) Due on October 11 <sup>th</sup> at/by 11:59pm
Week 8	Analyzing Continuous Variables	-Read Ch.5 and Complete Ch.5 Review Questions Due on October 18 <sup>th</sup> at/by 11:59pm
Week 9	Analyzing Continuous Variables and  Analyzing the Relationship between Two Variables	-Complete Lab 5.1 -Read Ch.6 and Complete Ch.6 Review Questions Due on October 25 <sup>th</sup> at/by 11:59pm
Week 10	Study Design and Sample Selection	-Read Ch.7 and Complete Ch.7 Review Questions -Complete Lab 7.1 Due on November 1 <sup>st</sup> at/by 11:59pm
Week 11	Exploratory Data Applications	-Read Ch.8 and Complete Ch.8 Review Questions Due on November 8 <sup>th</sup> at/by 11:59pm
Week 12	Exploratory Data Applications	-Complete Lab 8.1 and Lab 8.2 Due on November 15 <sup>th</sup> at/by 11:59pm
Week 13	Benchmarking and Analyzing Externally Reported Data	-Read Ch. 9 and Complete Ch.9 Review Questions Due on November 22 <sup>nd</sup> at/by 11:59pm
Week 14	Recent News Related to Data Analytics	-Complete Discussion Board Assignment #1 -Review Chapters 1-9 for final exam Due on November 29 <sup>th</sup> at/by 11:59pm
Week 15	Recent News Related to Data Analytics	-Complete Discussion Board Assignment #2 -Review Chapters 1-9 for final exam Due on December 6 <sup>th</sup> at/by 11:59pm

<b>WEEK</b>	<b>TOPIC</b>	<b>ASSIGNMENT &amp; DUE DATE</b>
Week 16	Final Exam Week ***End of Course***	<b>-Complete Final Exam (Chapters 1-9)</b> <b>Due on December 13<sup>th</sup> at/by 11:59pm</b>

## 2014 AHIMA Council for Excellence in Education (CEE) HIM Baccalaureate Degree Curriculum Requirements

<b>Subdomain I.B. Health Record Content and Documentation</b>		
3. Interpret health information standards (5)	* Health information standards and regulations	
<b>Subdomain I.C. Data Governance</b>		
1. Format data to satisfy integration needs (4)	* Capture, structure and use of health information	
<b>Subdomain I.D. Data Management</b>		
1. Analyze information needs of customers across the healthcare continuum (4)	* Capture, structure and use of health information	
3. Manage clinical indices/databases/registries (5)	* Secondary data source, registries and indices	
	* Healthcare data sets (HEDIS, UHDDS, OASIS)	
	* Indices and registry policies	
5. Evaluate data from varying sources to create meaningful presentations (5)	* Presentation software	
	* Healthcare data	
	* Indices and registries	
<b>Subdomain I.E. Secondary Data Sources</b>		
1. Validate data from secondary sources to include in the patient's record, including personal health records (3)	* Data stewardship	
	* Secondary data source, registries and indices	
<b>Subdomain II.B. Data Privacy, Confidentiality &amp; Security</b>		
1. Analyze privacy, security and confidentiality policies and procedures for internal and external use and exchange of health information (4)	* Patient verification and identity management policies	
	* Privacy, confidentiality, security principles, policies and procedures, federal and state laws	
2. Recommend elements included in the design of audit trails and data quality monitoring programs (5)	* Data security (Audits, controls, data recovery e-security; disaster recovery planning; business continuity planning)	
<b>Domain III. Informatics, Analytics and Data Use</b>		

<b>Subdomain III.A. : Health Information Technologies</b>		
1. Utilize technology for data collection, storage, analysis and reporting of information (3)	* Health information archival and retrieval systems	
	* Computer concepts (Hardware components, network systems architecture operating systems and languages, software packages and tools, Cloud computing applications)	
5. Evaluate system architecture, database design, data warehousing (5)	* System testing	
	* Interface management	
6. Create the electronic structure of health data to meet a variety of end user needs (6)	* Data relationships	
	* Data information and file structures (Data administration, data definitions, data dictionary, data modeling, data structures, data warehousing, database management systems)	
<b>Subdomain III.C. Analytics and Decision Support</b>		
1. Apply analytical results to facilitate decision-making (3)	* Data visualization, power point, dashboards	
2. Apply data extraction methodologies (3)	* Healthcare statistical formulas (LOS, death, birth, infection rates)	
3. Recommend organizational action based on knowledge obtained from data exploration and mining (5)	* Data exploration and mining	
4. Analyze clinical data to identify trends that demonstrate quality, safety and effectiveness of healthcare (4)	* Statistical analysis on healthcare data	
	* Descriptive statistics (Mean, standard deviation, ranges, percentiles)	
	* Inferential statistics (T-tests, ANOVA, regression analysis, reliability, validity)	
	* Epidemiological applications	
5. Apply knowledge of database querying and data exploration and mining techniques to facilitate information retrieval (3)	* SQL, data exploration and mining	
	* Data presentation standards and tools	

6. Evaluate administrative reports using appropriate software (5)	*SQL, reporting tools	
<b>Subdomain III.D. Health Care Statistics</b>		
1. Interpret inferential statistics (5)	* Inferential statistics (T-tests, ANOVA, regression analysis, reliability, validity)	
	* Computerized statistical packages (SPSS, SAS)	
2. Analyze statistical data for decision making (4)	* Statistical analysis on healthcare data	
	* Descriptive statistics (Mean, standard deviation, ranges, percentiles)	
	* Data reporting and presentations techniques	
<b>Domain IV. Revenue Management</b>		
<b>Subdomain IV.A. Revenue Cycle and Reimbursement</b>		
1. Manage the use of clinical data required by various payment and reimbursement systems (5)	* Clinical Data Management and reimbursement management	
	* Case Mix Management	
	* Payment Systems (PPS, DRGs, RBRVS, RUGs, Value Based Purchasing (VBP), MSDRGs, commercial, managed care, federal insurance plans; Billings and reimbursement at hospital inpatient and outpatient, physician office and other delivery settings)	
<b>Subdomain VI.F. Strategic and Organizational Management</b>		
6. Collaborate in the development and implementation of information governance initiatives (4)	* Inter/intra-organizational team building and leadership	
7. Facilitate the use of enterprise-wide information assets to support organizational strategies and objectives (4)	* Information management planning	
	* Enterprise information management	
	* Master data/information management	
<b>Subdomain VI.H. Ethics</b>		
	* Professional ethics issues	



1. Comply with ethical standards of practice (5)	* Ethical decision making process	
<b>Subdomain VI.K. Enterprise Information Management</b>		
1. Manage information as a key strategic resource and mission tool (5)	* Information Management Plan, information as an asset	

## Course Content

- I. Introduction to Data Analysis
  - A. Data Analysis
  - B. Types of Data
    1. Structured versus Unstructured Data
    2. Qualitative versus Quantitative Data
  - C. Types of Analytics
    1. Descriptive Statistics
    2. Inferential Statistics
    3. Explanatory Data Analysis and Data Mining
    4. Predictive Modeling
    5. Auditing
  - D. Skills Required for Data Analysis
  - E. Opportunities for Health Information Management Professionals in Healthcare Data Analytics
  - F. Analysis in Practice
- II. Data in Healthcare
  - A. Reliability and Validity
  - B. Types of Healthcare Data
    1. Diagnostic Data
    2. Procedural Data
    3. Pharmacy Data
    4. Administrative Data
  - C. Data Flow within Typical Healthcare Organizations
    1. Hospital Inpatient Data Flow
    2. Hospital Outpatient Data Flow
    3. Physician Practice Data Flow
  - D. Sources of Data
    1. Internal Data
    2. Departmental Databases
  - E. External Data
    1. Medicare
    2. State Databases

- 3. Other Organizations
- F. Analysis in Practice
- III. Tools for Data Organization, Analysis, and Preparation
  - A. Data Organization Using Databases
    - 1. Small-Scale Databases
    - 2. Complex Data in Large or Multiple Databases
    - 3. Data Dictionaries
    - 4. Structured Query Language (SQL)
  - B. The Use of Statistical Software Packages
    - 1. Statistical Analysis System (SAS)
    - 2. Statistical Package for the Social Sciences (SPSS)
    - 3. Specialized Databases
    - 4. Data Reports
  - C. The Role of Microsoft Excel in Data Analysis
  - D. Graphical Display of Data
    - 1. Tables
    - 2. Graphs
    - 3. Infographics
    - 4. The Data Display Decision
  - E. Analysis in Practice
- IV. Analyzing Categorical Variables
  - A. Descriptive Statistics
    - 1. Frequency Distributions of Coded Data
    - 2. Contingency Tables
    - 3. Rank
  - B. Inferential Statistics
    - 1. Hypothesis testing Basics
  - C. Rates and Proportions
    - 1. Common Utilization Statistics and Rates in Healthcare
    - 2. Utilization Rates
    - 3. Rates for Population Health and Epidemiology
    - 4. Descriptive Statistics
    - 5. Inferential Statistics
  - D. Analysis in Practice
- V. Analyzing Continuous Variables
  - A. Descriptive Statistics
    - 1. Measures of Central Tendency
    - 2. Measures of Variation
  - B. Inferential Statistics
    - 1. One-Sample t-test for the Population Mean
    - 2. Confidence Interval for the Population Mean
    - 3. Comparing More Than Two Population Means
  - C. Analysis in Practice

- VI. Analyzing the Relationship between Two Variables
  - A. Chi-squared Test of Independence
  - B. Sensitivity and Specificity
  - C. Correlation
    - 1. Descriptive Statistics
    - 2. Inferential Statistics
    - 3. Simple Linear Regression
  - D. Analysis in Practice
- VII. Study Design and Sample Selection
  - A. Types of Studies
  - B. Vocabulary of Sampling
  - C. Sample Selection techniques
    - 1. Probability Sampling Techniques
    - 2. Non-Probability Sampling
  - D. Selecting a Judgement
  - E. Sample for Compliance Monitoring
  - F. Selecting a Random Sample Using Statistical Software
    - 1. RAT-STATS Program from the Office of Inspector General
    - 2. RAT-STATS- How to Determine an Appropriate Sample Size
    - 3. Attribute Studies
    - 4. Variable Studies
  - G. Analysis in Practice
- VIII. Exploratory Data Applications
  - A. Diagnosis-Related Groups (DRGs) Data Analysis
    - 1. Case Mix Index (CMI) Analysis
    - 2. Other MS-DRG Measures
  - B. Other Factors Influencing MS-DRGS
    - 1. Present in Admission (POA) Indicator
  - C. Other Diagnosis-Related Group Methodologies
    - 1. All-Patient Diagnosis-Related Groups (AP-DRGs)
    - 2. All-Patient Refined Diagnosis-Related Groups (APR-DRGs)
  - D. Ambulatory Patient Classification (APC) Data Analysis
  - E. Challenges in APC Analysis
  - F. APC Frequency Reports
    - 1. Methods of Analysis
    - 2. APC Service-Mix Index (SMI)
    - 3. Outpatient Code Editor (OCE0 Codes
    - 4. Charge Analysis
    - 5. Analyzing Patterns of Care
  - G. Utilization Pattern Analysis (Bell Curve Graphs)
    - 1. Bell Curve Analysis
    - 2. Steps in Creating a Bell Curve Graph
  - H. Specialty-Specific Graphs for Physician Data

- I. Methods Analysis
  - 1. Validation of Utilization Patterns
- J. Relative Value Unit (RVU) Data Analysis
- K. Relative Value Systems
  - 1. Medicare Physician Fee Schedule
- L. RVU Analysis
  - 1. Physician Productivity
  - 2. Service Line Analysis
- M. Average Cost per RVU
  - 1. Calculating the Average Cost per RVU
- N. Other Data Calculations Using RVUs
  - 1. Physician Compensation per wRVU
  - 2. Malpractice Expenses per mRVU
  - 3. Overhead (Practice Expenses) per peRVU
  - 4. Break-Even Conversion Factor (BECF)
- O. Analysis in Practice
- IX. Benchmarking and Analyzing Externally Reported Data
  - A. The Benchmarking Process
    - 1. The Benefits of Benchmarking
    - 2. Steps in the Benchmarking Process
  - B. Hospital Value Based Purchasing Program
  - C. Dashboard Reports and Scorecards
  - D. Report Card Data and Quality Reporting
    - 1. National Quality Forum
    - 2. Medicare Quality Data
    - 3. Risk Adjustment
    - 4. The Leapfrog Group
    - 5. Bridges to Excellence
    - 6. HealthGrades
  - E. The National Committee for Quality Assurance (NCQA) and the Healthcare Effectiveness Data and Information Set (HEDIS)
  - F. Analysis in Practice