Chair: Tracy Christofero | **GC#2: Certificate**

Request for Graduate Addition, Deletion, or Change of a Certificate

1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
2. E-mail one identical PDF copy to the Graduate Council Chair. If attachments included, please merge into a single file.
3. ***The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.***

NOTE: *If proposing a new certificate, please read this first:* www.marshall.edu/graduate/graduatecouncil/certificatespolicy/certificatepolicy.pdf

College: Health Professions

Dept/Division: Health Informatics

Contact Person: Girmay Berhie

Phone: 304 696 2718

Name of Certificate: Data Analytics for Healthcare

Check action requested: ☒ Addition ☐ Deletion ☐ Change

Effective Term/Year: Fall 20 [18] Spring 20 [ ] Summer 20 [ ]

Information on the following pages must be completed before signatures are obtained.

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head Girmay Berhie	Date 10/30/2017
College Curriculum Chair	Date 10/31/17
College Dean	Date 10/31/17
Graduate Council Chair	Date
Provost/VP Academic Affairs	Date
Presidential Approval	Date

Request for Graduate Addition, Deletion, or Change of a Certificate

1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
2. E-mail one identical PDF copy to the Graduate Council Chair. If attachments included, please merge into a single file.
3. The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.
NOTE: *If proposing a new certificate, please read this first:* www.marshall.edu/graduate/graduatecouncil/certificatespolicy/certificatepolicy.pdf

College: Health Professions Dept/Division: Health Informatics

Contact Person: Girmay Berhie Phone: 304 696 2718

Name of Certificate Data Analytics for Healthcare

Check action requested: ☒ Addition ☐ Deletion ☐ Change

Effective Term/Year Fall 20 18 Spring 20 Summer 20

Information on the following pages must be completed before signatures are obtained.

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head	Date
College Curriculum Chair	Date
College Dean	Date
Graduate Council Chair	Date
Provost/VP Academic Affairs	Date
Presidential Approval	Date

Request for Graduate Addition, Deletion, or Change of a Certificate-Page 2

Please provide a rationale for addition, deletion, change:

Data Analytics in Healthcare is a highly important field assisting in the systematic use of data to drive fact-based decision making to assist in healthcare planning, management and measurement. According to a survey published by Journal of AHIMA (2015), Healthcare big data analytics and informatics skills will be among the most sought-after competencies for health information management (HIM) professionals in the next few years. Marshall will be able to provide continuing education for all healthcare staff, enabling them to have a comprehensive knowledge of applied data analytics within the healthcare arena.

Please describe any changes in curriculum:
List course number, title, credit hours. Note whether each course is required or optional. Enter NONE if no change.

HP 605- EHR & PHR (3 Credit Hours)
HP 610 - Healthcare Statistics (3 Credit Hours)
HP 630 - Research Methods and Data Analytics for Health Informatics (3 Credit Hours)
IS 535 - Applied Healthcare Databases/Tools (3 Credit Hours)
IS 545 - Healthcare Data Analytics and Visualization (3 Credit Hours)

1. ADDITIONAL RESOURCE REQUIREMENTS: If your program requires additional faculty, equipment or specialized materials to ADD or CHANGE this certificate, attach an estimate of the time and money required to secure these items.
NOTE: Approval of this form does not imply approval for additional resources. Enter NONE if not applicable.

In order to teach the new courses, the Health Informatics department needs to acquire one faculty member with a 9-month salary in the range of 65,000 to 70,000. This position will also be requested for other Health Informatics department responsibilities aside from this certificate. The responsibilities will include being a Health Informatics Practicum Coordinator, Health Informatics program promotion, student advising and recruitment, and other administrative responsibilities. As such, this position will need to be filled by June 30th, 2017

2. NON-DUPLICATION: If a question of possible duplication occurs, attach a copy of the correspondence sent to the appropriate department(s) describing the request and any response received from them. Enter NONE if not applicable.

None

For catalog changes as a result of the above actions, please fill in the following pages.

Request for Graduate Addition, Deletion, or Change of a Certificate-Page 3

3. *Current* Catalog Description

Insert the *Current* Catalog Description and page number from the latest catalog for entries you would like to change. May attach separate page if needed)

4. *Edits* to the Current Description

Attach a PDF copy of the current catalog description prepared in MS WORD with strikethroughs to mark proposed deletions and use the highlight function to indicate proposed new text.

5. *New* Catalog Description

Insert a 'clean' copy of your proposed description, i.e., no strikethroughs or highlighting included. This should be what you are proposing for the new description. (May attach separate page if needed).

Attached

Request for Graduate Addition, Deletion, or Change of a Certificate-Page 4

Please insert in the text box below your change summary information for the Graduate Council agenda. Please enter the information exactly in this way (including headings):

Department:
Name of Certificate:
Credit Hours:
Type of Change: *(addition, deletion, change)*
Rationale:

Department: Health Informatics
Name of Certificate: Data Analytics in Healthcare
Credit Hours: 15 Credit Hours
Type of Change: Addition
Rationale: Data Analytics in Healthcare is a highly important field assisting in the systematic use of data to drive fact-based decision making to assist in healthcare planning, management and measurement. According to a survey published by Journal of AHIMA (2015), Healthcare big data analytics and informatics skills will be among the most sought-after competencies for health information management (HIM) professionals in the next few years. Marshall will be able to provide continuing education for all healthcare staff, enabling them to have a comprehensive knowledge of applied data analytics within the healthcare arena.

Online Data Analytics in Healthcare Graduate Certificate

Data Analytics is the process of acquiring, extracting, integrating, transforming, and modeling data with the goal of deriving useful information. Its application is growing rapidly in health care organizations across the globe. Data Analytics in Healthcare enables the systematic use of data to drive fact-based decision-making to assist in healthcare planning, management and measurement. However, many organizations lack the knowledge to effectively utilize data analytics. As a result, according to a survey published by Journal of AHIMA (2015), healthcare big data analytics and informatics skills will be among the most sought-after competencies for health information management (HIM) professionals in the next few years.

The Marshall University Online Data Analytics in Healthcare certificate is designed to provide healthcare professionals with the skills required to compete for data analysis jobs amid rising demand in the healthcare industry. The certificate program will explore the intricacies of data analytics and expose students to various topics related to data processing, integration, analysis, and visualization. Individuals who complete this program will have a solid framework of data analytics methodologies accompanied by exposure to the tools used for knowledge discovery pertinent to health care.

The certificate is intended for students who are interested in transforming the massive data being produced in the health care industry into meaningful information. They are the individuals who want to determine what decisions or actions should be taken to generate value from the healthcare data produced every day.

Admission Requirements

Applicants should follow the admissions process described in the Graduate Catalog, or at the Graduate Admissions website at www.marshall.edu/graduate/admissions/how-to-apply-for-admission. (Submit all materials to the Graduate Admissions Office.) Students must have an undergraduate Grade Point Average (GPA) of 3.0 or higher on a 4.0 scale for all previously completed undergraduate university work, and GRE scores from GRE test taken within the past five years.

Program Requirements: ..... 15 Credit Hours

Students must take the following courses:

HP 605 -EHR & PHR ..... 3 Credit Hours

HP 610 - Healthcare Statistics .....3 Credit Hours

HP 630- Research Methods and Data Analytics for Health Informatics ..... 3 Credit Hours

IS 535 - Applied Healthcare Databases/Tools .....3 Credit Hours

IS 545 -Healthcare Data Analysis and Visualization .....3 Credit Hours

Courses in this certificate can also be applied to a Masters in Health Informatics.

Chair: Tracy Christofero | **GC#6: Course Addition**

Request for Graduate Course Addition

1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
2. E-mail one identical PDF copy to the Graduate Council Chair. If attachments included, please merge into a single file.
3. ***The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.***

College: Health Professions Dept/Division: Health Informatics Alpha Designator/Number: IS 545 (•) Graded ( ) CR/NC

Contact Person: Girmay Berhie Phone: 304 696 2718

NEW COURSE DATA:

New Course Title: Healthcare Data Analytics and Visualization

Alpha Designator/Number: I S 5 4 5

Title Abbreviation: H E A L T H C A R E D A T A A N A L Y T I C S

(Limit of 25 characters and spaces)

Course Catalog Description: (Limit of 30 words)

The course focuses on the systems, techniques, strategies and methods of big data analysis, data mining and machine learning algorithms and data visualization techniques in healthcare settings.

Co-requisite(s): None First Term to be Offered: Fall 2018

Prerequisite(s): Graduate Status Credit Hours: 3

Course(s) being deleted in place of this addition (*must submit course deletion form*): N/A

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head Girmay Berhie	Date 10/30/2017
Registrar Sonya L Ca 11 04 01	Date 11/1/17
College Curriculum Chair	Date 10/31/17
Graduate Council Chair	Date

Form updated 10/2011

Chair: Tracy Christofero | **GC#6: Course Addition**

Request for Graduate Course Addition

1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
2. E-mail one identical PDF copy to the Graduate Council Chair. If attachments included, please merge into a single file.
3. The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.

College: Health Professions Dept/Division: Health Informatics Alpha Designator/Number: IS 545 (•) Graded ( ) CR/NC

Contact Person: Girmay Berhie Phone: 304 696 2718

NEW COURSE DATA:

New Course Title: Healthcare Data Analytics and Visualization

Alpha Designator/Number: I S 5 4 5

Title Abbreviation: H E A L T H C A R E D A T A A N A L Y T I C S

(Limit of 25 characters and spaces)

Course Catalog Description: (Limit of 30 words)

The course focuses on the systems, techniques, strategies and methods of big data analysis, data mining and machine learning algorithms and data visualization techniques in healthcare settings.

Co-requisite(s): None First Term to be Offered: Fall 2018

Prerequisite(s): Graduate Status Credit Hours: 3

Course(s) being deleted in place of this addition (*must submit course deletion form*): N/A

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head _____	Date _____
Registrar _____	Date _____
College Curriculum Chair _____	Date _____
Graduate Council Chair _____	Date _____

Request for Graduate Course Addition - Page 2

College: Health Professions | Department/Division: Heath Informatics | Alpha Designator/Number: IS 545

Provide complete information regarding the new course addition for each topic listed below. Before routing this form, a complete syllabus also must be attached addressing the items listed on the first page of this form.

1. FACULTY: Identify by name the faculty in your department/division who may teach this course.

TBA

2. DUPLICATION: If a question of possible duplication occurs, attach a copy of the correspondence sent to the appropriate department(s) describing the proposal. Enter "***Not Applicable***" if not applicable.

Not Applicable

3. REQUIRED COURSE: If this course will be required by another deparment(s), identify it/them by name. Enter "***Not Applicable***" if not applicable.

Not Applicable

4. AGREEMENTS: If there are any agreements required to provide clinical experiences, attach the details and the signed agreement. Enter "***Not Applicable***" if not applicable.

5. ADDITIONAL RESOURCE REQUIREMENTS: If your department requires additional faculty, equipment, or specialized materials to teach this course, attach an estimate of the time and money required to secure these items. (Note: Approval of this form does not imply approval for additional resources.) Enter "***Not Applicable***" if not applicable.

The Health Informatics Department needs to acquire one faculty member with a 9-month salary in the range of 50,000 to 60,000. This position will also be required for other Health Informatics department responsibilities aside form this course. The responsibilities will include being a Health Informatics Practicum Coordinator, Health Informatics program promotion, student advising and recruitment, and other administrative responsibilities. As such, this position will need to be filled by June 30th, 2017.

6. COURSE OBJECTIVES: (May be submitted as a separate document)

Please see attached syllabus

Request for Graduate Course Addition - Page 3

7. COURSE OUTLINE (May be submitted as a separate document)

Please see attached syllabus.

8. SAMPLE TEXT(S) WITH AUTHOR(S) AND PUBLICATION DATES (May be submitted as a separate document)

Healthcare Data Analytics
ISBN: 978-1482232110

9. EXAMPLE OF INSTRUCTIONAL METHODS (Lecture, lab, internship)

Recorded Lecture/Online Course
Instructor Guided Content with Student-Driven Learning
Discussion Boards

Request for Graduate Course Addition - Page 4

10. EXAMPLE EVALUATION METHODS (CHAPTER, MIDTERM, FINAL, PROJECTS, ETC.)

Mid-term Exam, Home Work Projects, Discussion board posts, Final Project

11. ADDITIONAL GRADUATE REQUIREMENTS IF LISTED AS AN UNDERGRADUATE/GRADUATE COURSE

Not Applicable.

12. PROVIDE COMPLETE BIBLIOGRAPHY (May be submitted as a separate document)

Please see attached syllabus.

Request for Graduate Course Addition - Page 5

Please insert in the text box below your course summary information for the Graduate Council agenda. Please enter the information exactly in this way (including headings):

Department:
Course Number and Title:
Catalog Description:
Prerequisites:
First Term Offered:
Credit Hours:

Department Health Informatics
Course Number and Title: IS 545 - Healthcare Data Analytics and Visualization
Catalog Description: The course focuses on the systems, techniques, strategies and methods of big data analysis, data mining and machine learning algorithms and data visualization techniques in healthcare settings.
Prerequisites: Graduate Status
First Term Offered: Fall 2018
Credit Hours: 3

I'd rather attempt to do something great and fail than to attempt to do nothing and succeed.

~Robert H. Schuller

Course Title/Number	**IS 545 – Healthcare Data Analytics and Visualization**
Semester/Year	Fall 2018
Days/Time	Online Course – No Meeting times or dates
Location	Online
Instructor	TBA
Office	TBA
Phone	
Email	
Office/Hours	By Appointment; Open communication via email at any time
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to http://www.marshall.edu/academic-affairs/policies/. Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

Course Description from Catalog

The course focuses on the systems, techniques, strategies and methods of big data analysis, data mining and machine learning algorithms and data visualization techniques in healthcare settings.

Student Learning Outcome (Students will...)	Practiced by:	Assessed by:
Be familiar with multiple statistical analysis applications, and be able to perform standard statistical analyses on healthcare datasets with SAS.	Reading assignments, Homework	Homework, Projects, Midterm
Be able to import and integrate data from a variety of different sources and formats into standard statistical analysis applications.		
Be able to manipulate data within standard statistical analysis applications to facilitate analysis of healthcare datasets.		
Be able to identify the types of data presented in a healthcare dataset and use this information to select an appropriate statistical test.		
Be able to summarize, analyze, report, and present analytical results a clear an coherent form using appropriate software..		

Attendance Policy

Online class: Not applicable.

Required Texts, Additional Reading, and Other Materials	
	Data Analytics in Healthcare Research: Tools and Strategies
Author	David Marc, MBS, CHDA, and Ryan Sandefer, MA, CPHIT
ISBN	978-1584264439
Publisher	AHIMA Press
Pub. Date	2016

Course Requirements/Due Dates

Discussion Board Posts

Most weeks, there will be a discussion board post due.

Homework: The homework assignments will utilize health care data sets.

#	Description	Due beginning of:
1	Advanced Excel Orientation Homework	2nd Week
2	Advanced Charts/Graphs -> Visualization Homework	3rd Week
3	Advanced Excel Pivot Tables Homework	5th Week
4	Project 1	6th Week
5	SAS Orientation Homework	7th Week
6	SAS Homework 1	9th Week
7	SAS Homework 2	11th Week
8	Project 2	13th Week
9	Final Report & Presentation	14th Week
10	Final Presentation Discussion Posts	15th Week

Final Report & Presentation: Due beginning of the 14th week of class.

Each student will be required to do a final report, and five minute recorded presentation on a data analysis and visualization software application: May use one of the following (or other instructor approved application):

- SAS
- SPSS
- Google Analytics
- Crystal Reports
- SSAS (SQL Server Analysis Services)
- Redcap
- Tableau
- POWERBI
- SQL Server and Visual Studio Data Tool
- Jaspersoft

Discussion Post/Response to all other students' presentations sue by Midnight the last day of class.

Grading Policy	
A	90-100%
B	80-89%
C	70-79%
F	Below 70%
Activities & Points	
15%	Discussion Board Posts
20%	Homework Assignments
15%	Project 1
15%	Project 2
20%	Final Report
10%	Final Presentation
5%	Final Discussion Post

Late Assignments will be deducted 10% for each day they are turned in late.

100% credit will be given for completing all aspects of the assignment correctly. Any points deducted will have an accompanying explanation.

10% extra credit can be earned on any assignment in which a student goes above and beyond the requirements or produces otherwise exceptional work.

Note: The professor reserves to the right to make changes to this syllabus.

Course Schedule		
Week	**Text Book**	**Topic**
1	Lynda.com, MuRemote Chapter 1	Introduction to Data Analysis and Visualization – Why is it important in Healthcare? Data and Information Governance
2	Chapter 2	Data Analytics and Privacy and Security Data Visualization, Advanced Excel Charts/Graphs
3	Chapter 3	Pivot Table Exploration Introduction to Data Analysis: Tools, Techniques, and Data
4	Chapter 5	Pivot Table: Data Importing, Integration Introduction to R
5	Chapter 6	Project 1: Practical Application of all knowledge to date Exploratory Data Analysis and Data Visualization of MS-DRGs
6	Chapter 7	Evaluating Participation in the EHR Incentive Program SAS Orientation; select final report application
7	Chapter 8	Population Health: Hazardous Air Pollutants and County Level Health Measures SAS: Numerical Summaries, Probability, OddsRatio (OR)/Relative Risk (RR)
8	Chapter 9	Comparative Effectiveness Research: Case Study of Hospital Readmissions SAS: Interpreting Numerical Summaries, Probability, OR/RR
9	Chapter 10	Comparing Medicare Spending per Patient and Patient Satisfaction Scores SAS: Importing DataSets, Distribution of Mean, C.I., Hypothesis testing
10	Chapter 11	Evaluating Excessive Hospital Readmissions: The Geographic Impact SAS: Correlation, Regression, Inference on Proportions.
11	Chapter 12	Nursing Home Excessive Hospital Readmissions: The Geographic Impact Project 2: Practical Application of all knowledge to-date
12	Chapter 13	The Relationship Between a Quality Measure and Staffing Hours in Nursing Homes Expectations or Report, Presentation, Discussion
13	Chapter 14	Studying the Relationship Between Primary Care Access and Preventive Care Utilization Final Reports & Presentation Due
14	Thanksgiving Break!	Thanksgiving Break! No Reading Assigned
15	Chapter 15	Using Data Mining Techniques to Predict Healthcare-Associated Infections Issues with Database Management in Healthcare
16	Finals Week	Final Discussion Posts Due

Data Analytics in Healthcare

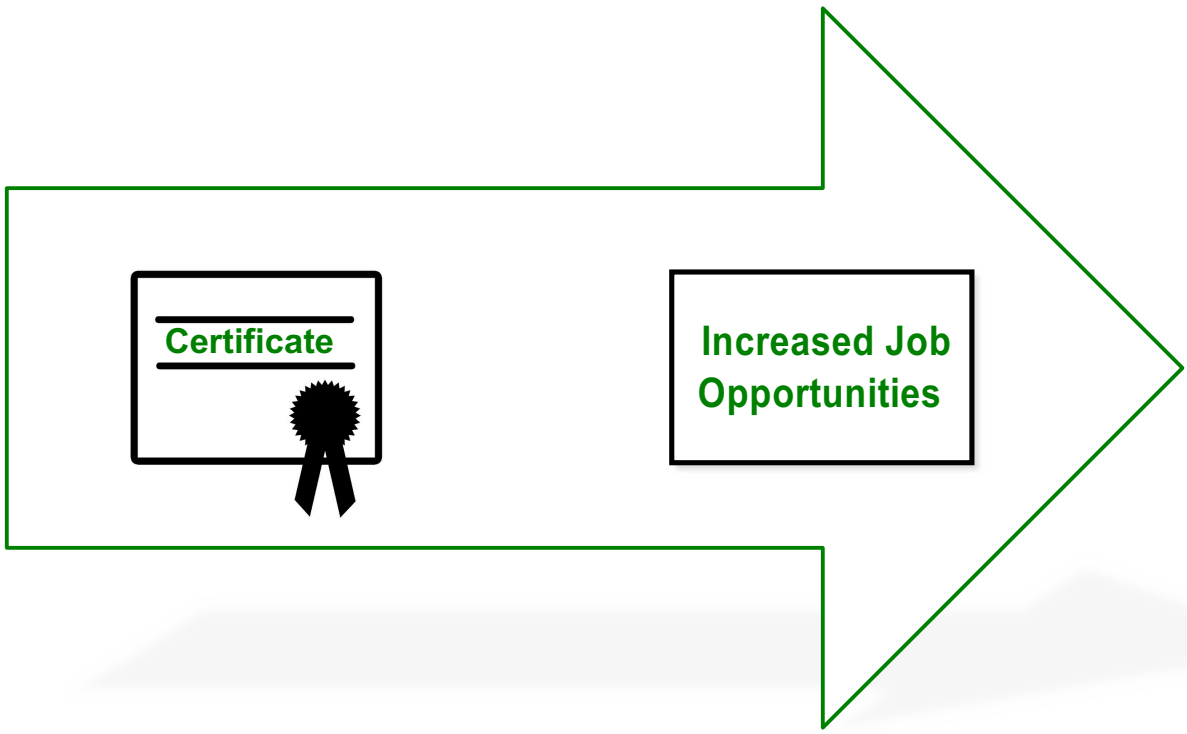
Online Graduate Certificate

Department of Health Informatics

College of Health Professions

Marshall University

September 26, 2017,



Girmay Berhie, Ph.D.
Professor/Director
Department of Health Informatics

Online Data Analytics in Healthcare Graduate Certificate

Data Analytics is the process of acquiring, extracting, integrating, transforming, and modeling data with the goal of deriving useful information. Its application is growing rapidly in health care organizations across the globe. Data Analytics in Healthcare enables the systematic use of data to drive fact-based decision-making to assist in healthcare planning, management and measurement. However, many organizations lack the knowledge to effectively utilize data analytics. As a result, according to a survey published by Journal of AHIMA (2015), healthcare big data analytics and informatics skills will be among the most sought-after competencies for health information management (HIM) professionals in the next few years.

The Marshall University Online Data Analytics in Healthcare certificate is designed to provide ***healthcare professionals*** with the skills required to compete for data analysis jobs amid rising demand in the healthcare industry. The certificate program will explore the intricacies of data analytics and expose students to various topics related to data processing, integration, analysis, and visualization. Individuals who complete this program will have a solid framework of data analytics methodologies accompanied by exposure to the tools used for knowledge discovery pertinent to health care.

The certificate is intended for students who are interested in transforming the massive data being produced in the health care industry into meaningful information. They are the individuals who want to determine what decisions or actions should be taken to generate value from the healthcare data produced every day.

Data Analytics in Healthcare Certificate Curriculum

Courses	Credits
HP 605 – EHR & PHR and Cerner Simulation Lab	3
HP 610 – Healthcare Statistics or elective	3
HP 630 – Research Methods and Data Analytics for Health Informatics	3
IS 535/or 623 – Applied Healthcare Databases/Tools or Data base Systems	3
IS 545 or 624 – Healthcare Data Analysis & Visualization or Data mining	3
Total	**15**

Additional Curriculum Rationale

In order to provide this certificate, five courses are being developed. The following section is to outline the rationale for course addition and the differences of these courses as opposed to already offered courses at Marshall University. First, all of these courses will be offered online as opposed to the existing courses that are currently offered on-campus. Secondly, the major unique factor in all of these courses are the alignment to the CAHIIM competencies for Health Informatics – that is around the outcomes of implementing Electronic Health Records, Personal Health Records, Health Information Networks, Healthcare Data, etc. Due to appreciated feedback

concerning lack of uniqueness from existing courses, we have the updated the curriculum to provide a more focused experience in Data Analytics applied to healthcare.

HP 610 – Healthcare Statistics

Catalog Description: Statistical techniques useful in healthcare research and healthcare administrative decision-making including frequency distributions, statistical inference, and application of chi squared, ANOVA, and regression.
Text: Calculating and Reporting Healthcare Statistics, Fourth Edition. By Loretta Horton, Med, RHIA, FAHIMA. (AHIMA) SAS, SPSS, JMP
Rationale: Though this may be perceived as a similar course to biostatistics, this course will introduce examples and applications unique to Health Information Management professionals such as compiling inpatient service days, length of stay and occupancy, and mortality rates. It will be covering the AHIMA statistics domains for Health Information Management professionals.

IS 545 – Healthcare Data Analytics and Visualization

Catalog Description:

The course focuses on the systems, techniques, strategies and methods of big data analysis, data mining and machine learning algorithms and data visualization techniques in healthcare settings.

Book:

Data Analytics in Healthcare Research: Tools and Strategies**.** David Marc, MBS, CHDA, and Ryan Sandefer, MA, CPHIT. 978-1584264439. AHIMA Press (2016).

Rationale:

The course focuses on the systems, techniques, strategies and methods of big data analysis, data mining and machine learning algorithms and data visualization techniques in healthcare settings.

I'd rather attempt to do something great and fail than to attempt to do nothing and succeed.

~Robert H. Schuller

Course Title/Number	**IS 535 – Applied Healthcare Databases/Tools**
Semester/Year	Spring 2018
Days/Time	Online Course – No Meeting times or dates
Location	Online
Instructor	TBA
Office	TBA
Phone	
Email	
Office/Hours	By Appointment; Open communication via email at any time
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to http://www.marshall.edu/academic-affairs/policies/. Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

Course Description from Catalog
To understand the logical and physical design of data stored and retrieved from relational databases, how it applies to healthcare, and how HIM professionals can effectively communicate business requirements.

Student Learning Outcome (Students will...)	**Practiced by:**	**Assessed by:**
Be able to identify and define data elements and construct a data dictionary for a Health care application.	Reading assignments, Homework	Homework, Projects, Midterm
Be able to normalize data from a healthcare data set/setting environment.		
Be able to develop and entity relationship diagram (ERD) based on healthcare business requirements/end user needs..		
Be able construct Structured Query Language (SQL) statements for healthcare database definitions, manipulation, and data retrieval.		
Be able to apply the principles of information integrity, security, and confidentiality to a healthcare database. Additional, emphasis on confidentiality due to HIPPA requirements.		
Be able to identify issues with database systems that are unique to the healthcare environment.		

Attendance Policy
Online class: Not applicable.

Required Texts, Additional Reading, and Other Materials	
	Healthcare Databases: A Simple Guide to Building and Using Them
Author	Alan Giles
ISBN	978-1857759723
Publisher	CRC Press
	Database Systems: Design, Implementation, & Management
Author	Carlos Coronel & Steven Morris
ISBN	9781285196145
Publisher	CRC Press
Pub. Date	2015

Other Materials

1. Campbell, Robert J. "*Database design: what HIM professionals need to know*." Perspectives in health information management/AHIMA, American Health Information Management Association 1 (2004).
2. AHIMA. "*Managing Copy Functionality and Information Integrity in the EHR*." Journal of AHIMA 83, no.3 (March 2012): 47-49.
    a. http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_049377.hcsp?dDocName=bok1_049377
    b. http://csrc.nist.gov/news_events/hiipaa_june2012/day1/day1-b2_drode_integrity-protections.pdf
3. Eliason, B., Burke, J., & Hess, P. *"Master Data Management in Healthcare: 3 Approaches"* Health Catalyst
    a. https://www.healthcatalyst.com/master-data-management-in-healthcare-3-approaches
4. LeSuer, D. *"5 Reasons Healthcare Data Is Unique and Difficult to Measure"* Health Catalyst
    a. https://www.healthcatalyst.com/5-reasons-healthcare-data-is-difficult-to-measure
5. Dolins, S., Kero, R. *"Data Managmenet Challenges for U.S. Healthcare Providers"*
    a. http://www.irma-international.org/viewtitle/32893/
6. MITRE. (2015) *"Eliciting, Collecting, and Developing Requirements"* MITRE- Systems Engineering Guide
    a. http://www.mitre.org/publications/systems-engineering-guide/se-lifecycle-building-blocks/requirements-engineering/eliciting-collecting-and-developing-requirements

Course Requirements/Due Dates

Discussion Board Posts

Most weeks, there will be a discussion board post due. It will be based on the Healthcare Database: A Simple Guide to Building and Using Them, articles in relation to effective communication of business requirements/needs, and challenges of database management in healthcare.

Homework: The homework assignments will utilize health care data sets.

#	Description	Due beginning of:
1	Identification of Data Elements/Terminology	3rd Week
2	Data Normalization	5th Week
3	Data Dictionary	7th Week
4	Database Modeling and Design	10th Week
5	Data Definition Language SQL	11th Week
6	Data Manipulation Language SQL	13th Week
7	Data Query Language SQL	15th Week

Mid-Term: Due by Midnight Monday of the 9th week of class.

There will be a take home exam that will include multiple choice, t/f, and problem solving questions.

Project Proposal (Due Monday Midnight 7th Week): Project Description, and proposed reports ideas.

Project Rough-Draft (Due Monday Midnight 12th Week): Requires Project Description, Business Requirements, Data Dictionary, ERD Diagram, Two Sample Reports Descriptions/Outlines

Final Project: Due by Midnight the last day of class.

There will be a final project in where the student will elect a project or be given a project that utilizes a healthcare data setting. The project submission will include:

- *Project Description*
- *Business Requirements/End Use Requirements: KEY ELEMENT*
- *Data Dictionary*
- *ERD Diagram*
- *Data Definition Queries*
- *Two Sample Reports Needed and Accompanying Queries*

Grading Policy

A	90-100%
B	80-89%
C	70-79%
F	Below 70%

Activities & Points

15%	Discussion Board Posts
30%	Homework Assignments
10%	Mid-Term
10%	Project Proposal
10%	Project Rough Draft
20%	Final Project

Late Assignments will be deducted 10% for each day they are turned in late.

100% credit will be given for completing all aspects of the assignment correctly. Any points deducted will have an accompanying explanation.

10% extra credit can be earned on any assignment in which a student goes above and beyond the requirements or produces otherwise exceptional work.

Note: The professor reserves to the right to make changes to this syllabus.

Course Schedule			
Week	**Text Book***	**Topic**	**Assignments (Monday at Midnight)**
1	Chapter 1 & 2	Introduction; General Terminology, Systems, Models, Importance in Healthcare	2nd week: Discussion Board Post
2	Chapter 3 & 6	Relational Model & Normalization	3rd Week Discussion Board Post: HW #1
3	Chapter 4, 5, 6	Data Elements, Data Types	4th Week: Discussion Board Post
4	Chapter 4	Business Requirements, Data Dictionary	5th Week: Discussion Board Post 5th Week: HW #2
5	Chapter 4	Database Modeling	6th Week: Discussion Board Post
6	Chapter 4	Database Modeling (Give out Midterm)	7th Week: HW #3 7th Week: Project Proposal
7	Chapter 7, 9	Data Definition Language SQL	8th Week: Discussion Board Post
8	Chapter 7, 9	Data Definition Language SQL	9th Week: Midterm Due
9	Chapter 7	Data Manipulation Language SQL	10th Week: HW #4 10th Week: Discussion Board Post
10	Chapter 7	Data Manipulation Language SQL	11th Week: Discussion Board Post 11th Week: HW #5
11	Chapter 7, 8	Data Query Language SQL	12th Week: Project Rough Draft
12	Chapter 7, 8	Data Query Language SQL	13th Week: Discussion Board Post 13th Week: HW #6
13	Article 2 of other Resources	Principles of Information Integrity, security, and confidentiality to a database (HIPPA, EHRS, HIEs)	14th Week: Discussion Board Post
14	Thanksgiving Break!	Thanksgiving Break! No Reading Assigned	15th Week: Discussion Board Post 15th Week: HW #7
15	Articles 3	Issues with Database Management in Healthcare	16th Week: Discussion Board Post
16	Finals Week		Exam Day: Final Project Due (1 point extra credit for each day a complete project is turned in early)
* TextBook for listed Chapters: *Database Systems: Design, Implementation, & Management*			

Marshall University
Syllabus Template

Course Title/Number	**HP 605 – The role of EHR and PHR** (3 hours credit) **Simulation Lab: Cerner**
Semester/Year	Fall 2017
Days/Time	Monday-4:00 pm to 6:20 pm
Location	GH 123
Instructor	**Girmay Berhie, PhD, MSW, MS-IS**
Office	GH 107
Phone	304-696-2718
E-Mail	berhie@marshall.edu
Web-page	webpages.marshall.edu/~berhie
Office/Hours	By appointment only on day of the class
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802 Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

Course Description: From Catalog

The course will introduce students to the main concepts of Electronic Health Records and the current EHR systems being used at major health care providers in the US.

	Course Student Learning Outcomes	How Practiced in this Course	How Assessed in this Course
EHR	Describe the factors that led to the emergence of electronic health records.	Video – Conference Case- studies Power point presentation Lecture Guest speaker Demonstration of software Benchmarking	Exam Research project Papers Power point presentation Article critique
	Discuss the concept and evolution of the electronic health record (EHR).		
	Discuss EHR challenges and the supporting roles of health information management professionals in addressing them, especially with respect to privacy, security and legal aspects.		
	Describe the planning and implementation aspects of EHRs.		
	State examples of EHR systems as they may be implemented in various types of care setting.		
	Identify and define terms associated with EHRs.		
	Relate the various initiatives local, regional, and national adoption of EHR and health information technology (HIT).		
	Describe the current state of EHR adoption and the technologies that help transition to the EHR.		
	Explain how paper records are converted to an EHR system.		
	Demonstrate an understanding of how EHR's are used in physician practices.		

EHR & PHR	Demonstrate an understanding of how electronic health records are used in hospitals.	Video – Conference Case- studies Power point presentation Lecture Guest speaker Demonstration of software Benchmarking	Exam Research project Papers Power point presentation Article critique
	Describe the different types of Personal Health Records and explain how PHR's differ from EHR's.		
	Demonstrate an understanding of the challenges to maintain information privacy and security.		
	Compare various types of EMR/EHR systems		
	Based on hands-on experience, describe the benefits of using an electronic health record.		
	Effectively utilize information technology and medical terms as they apply to EHR/EMR.		
	Discuss the concept and evolution of the electronic health record (EHR) and evaluate and defend the current state of the EHR and technologies.		
	Differentiate between heath information type, content, and forms of media.		
	Differentiate between health record data definitions, vocabularies, terminologies and dictionaries.		

HIPPA	Understand the process and key features of HIPAA regulation and its impact on the healthcare professional.	Video – Conference Case- studies Power point presentation Lecture Guest speaker Demonstration of software Benchmarking	Exam Research project Papers Power point presentation Article critique
	Define HIPAA and explain what information must be protected under the privacy laws.		
	Explain HIPAA patient rights		
	Identify consequences for non-compliance with HIPAA Regulations.		
	Define security standards regarding passwords and email.		
	Define security policies regarding network security, including definitions of authentication, VPN, Intrusion detection, Virus Software, and Firewalls.		
	Explain disaster recovery and how to handle paper record disposal.		
	Define Medical Informatics and give an overview of different Healthcare Software Applications.		
	Identify various job roles and job duties that are part of Health Informatics.		
	List Professional Organizations that support Health Informatics		

Required Texts, Additional Reading, and Other Materials

Required:

Health IT and EHRs: Principles and Practice: sixth Edition Margret K. Amatayakul MBA, RHIA, CHPS, CPHIT, CPEHR, FHIMSS (**Requred)**

Electronic Health Records: A Practical Guide for Professionals and Organizations, Fifth Edition, AHIMA Margret K. Amatayakul (**Recommended)**
ISBN 978-1-5842-6291-6

Required Journal Articles for Session 1.

⇒ Health Information Technology for economic and Clinical Health (HITECH) Act, Title XIII of Division A and Title IV of Division B of the American Recovery and Reinvestment Act of 2009 (ARRA), Pub. L. N0'111-5 (Feb 17,2009), codified at 42 U.S.C §§300jj et seq.; §§17901 et seq.

⇒ Kulikowski,C.,Shortliffe E.,L. Currie et al. "AMIA Board white paper: definition of biomedical informatics and specification of core competencies for graduate education in the discipline" Journal of the American Medical Informatics Association. http:/jamia.bmj.com/content/early/2012/06/20 amiajnl-2012-001053.full.

⇒ Jones,S.,Heaton,P.,Rudin,R.,E Schneider. "Unraveling the IT productivity Paradox – Lessons for Health Care" New England Journal of Medicine, 366:24;p.2243-2245.

Recommended:

Medicare Patients Aren't Getting Sicker or Older, But Doctors Are Charging More
MacNeil/Lehrer Productions | video | MLP-2012-09-17-1 | 0h 6m 30s

In 2012, the Center for Public Integrity investigated how Medicare billing changed over the past decade and found doctors were billing at much higher rates. Hari Sreenivasan talks to Center for Public Integrity's Fred Schulte to understand why doctors are 'upcoding' more and why electronic medical records could be driving higher prices. Air Date: 9/17/2012 © MacNeil/Lehrer Productions

Course Requirements / Due Dates

HCA 600- Health Care System in the United States (3hr)

Grading Policy

Graded (Required) Activities	Weight	Final Grade Policy	
Exam 1:	20%	A	90% - 100%
Exam 2:	20%	B	80% - 89%
Exam 3:	20%	C	70% - 79%
Term Paper	30%	F	< 69%
Attendance:	10%		
IRB: RCR Course*	5%		
Total	**105%**		

* Passing the Responsible Conduct of Research (RCR) course for Institutional Board of Research is requirement to pass this course. All researchers, staff and students of NSF sponsored grants are required to complete an educational course. The educational course utilized by Marshall University is the Collaborative Institutional Training Initiative (CITI). You will receive a certificate when you pass the course with an 80% or higher. Send the copy of the certificate to receive completion credit for the course.

Instructions for signing up and completing the RCR course can be found:
http://www.marshall.edu/ori/human-subject-research/education/
On this page, use the instructions link entitled for detailed instructions:
CITI Registration Instructions for Responsible Conduct of Research (RCR) Course

MAKE-UP TEST PROCEDURES

If it is necessary to be absent during an assigned test period, the student must make-up that examination within one week of the original test date (if the exam is given on Monday, it must be made up PRIOR to the next Monday). Failure to dos so will result in a zero for the examination. The student may miss one exam without penalty, as long as the test is made up within the specific time period. If the student misses more than one exam, the exam may be made up, but the maximum score allowed is 80%. The final examination must be taken on the scheduled date and at the scheduled time.

Attendance Policy

Students are expected to attend all classes. If it is necessary to be absent from class the student is responsible for all assignments and materials covered in class. It will be necessary to obtain a fellow classmate's notes or have a classmate tape-record the lecture for you. It is the student's responsibility to make up deficits incurred due to absence from class and to do so in a timely manner. If there are questions or handouts, come and see the instructor as necessary.

Students will be expected to participate in all class activities. Outside assignments include preparation for classroom discussion. Assigned readings and unit objectives are to be completed prior to class time.

Course Schedule

Guest Lecturers:
9/8, 9/15: Alfred Cecchetti: All Scripts/EHR/Data Structure)
10/13: Pete Andresen (Next Gen)
10/20: Nathan Cantrell – Meaningful Use Stages 1, 2, 3

Date	Session Content
8/25	***1: Introduction to Electronic Health Records*** ⇒ Definition of Health Informatics and EHR, History, Benefits of EHR, EHR Migration path (clinical data), EHR. adoption status and Limitations ⇒ Chapter 1 – Electronic Health Records
	Assignments: Read Chapter 2 and 3 Read the articles and identify the key point in each of the three articles listed in the Required Texts, Additional Reading, and Other Material for Session 1.
9/1	***2. Information Systems and EHR adoption*** ⇒ Information systems theory, systems development Life Cycle, challenges and leadership to EHR adoption. ⇒ Quality Improvement Utilizing the EHR – Using the EHR to analyze and learn about Quality Management and performance improvement within the healthcare system. ⇒ Chapter 2 & 3 – Electronic Health Records
	Assignments: Read Chapter 4, 5 and 6 Electronic Health Records
9/8	***3. EHR Project Management, Strategic Planning and Quality Care*** ⇒ Project management tools and resources, strategic planning applied to the EHR and impact on Quality of Care. ⇒ Clinical Decision – Exploring 'order checks' in the EHR and their role in Clinical Decision Making. ⇒ Chapter 4,5,6. – Electronic Health Records by Margret K. Amatayakul ***Guest Speaker:*** Alfred Cecchetti (All Scripts/EHR/Data Structure)
	Assignments: Study Case, You are in charge to evaluate the quality, and the level of implementation of EHR in a health care facility. Develop a check list to evaluate roles, responsibilities, design, implementation and quality including the key elements in EHR project management, strategic planning and quality care.

9/15	***4. Workflow and process mapping tools and skills, Functional needs assessment process, process improvement*** ⇒ Hospital Inpatient Quality Measures – Making a detailed review, or audit, of a chart to determine if the documentation meets the standards outlined in the 'Specifications Manual for National Hospital Inpatient Quality Measures' by the Joint Commission. ⇒ Select a Health care facility and implement the check list designed. Write a report with the conclusions and recommendations to improve. ***Guest Speaker:*** Alfred Cecchetti (All Scripts/EHR/Data Structure)
	Assignments: Test preparation.
9/22	***6. Exam I: Chapter 1, 2, 3, 4***
	Assignments Chapter 9 & 10 Electronic Health Records
9/29	***7. Information Technology and Health Information Systems Infrastructure*** ⇒ Data Infrastructure, Architecture, Network, Interoperability, Standard Messaging Protocols, Documentation and emerging technologies. ⇒ Reporting in the EHR – Utilizing the report functions in the EHR to query Patient Information ⇒ Electronic Health Records Overview ⇒ By Center for Enterprise Modernization, McLean, Virginia. Available at www.ncrr.nih.gov/publications/informatics/ehr.pdf ***Guest Speaker:***
	Assignments: Chapter 12 & 13 Electronic Health Records by Margret K. Amatayakul
10/6	***8. Overview of the current software*** ⇒ Retrieval of Data – Performing Data Retrieval within the EHR that focuses on finding key information from a patient's chart to be used in a research study ⇒ Resource Patient Management System (RPMS) Basic Training. ⇒ By Betty Ruuttila, DSS training Program. Available at: ⇒ www.anthc.org/cs/dit/dss/rpmstraining/upload/RPMS-Basic-Training.PDF ⇒ RPMS Programming Standards and Convention By Indian Health Service – Office of Information Technology.Available at www.ihs.gov/rpms/Downloads/RPMS_ProgrammingSAC 2009.pdf ***Guest Speaker:***
	Assignments: None

10/13	***9. Current Software*** ⇒ Resource and Patient Management System (RPMS) ⇒ Chart Deficit Query/Data Mining in the EHR ⇒ Resource Patient Management System (RPMS) Basic Training ⇒ By Betty Ruuttila, DSS training Program. Available at : ⇒ www.anthc.org/cs/dit/dss/rpmstraining/upload/RPMS-Basic-Training.PDF ⇒ RPMS Programming Standards and Convention By Indian Health Service – Office of Information Technology. Available at www.ihs.gov/rpms/Downloads/RPMS_ProgrammingSAC_2009.pdf

	Guest Speaker: Pete Andresen: Next Gen/ ICD-10
	Assignments: None
10/20	***9. Current Software*** ⇒ Veterans Health Information Systems and Technology Architecture (VISTA) ⇒ Summary and Feedback ⇒ Other Vendors (such as SIEMENS, EPIC, HIMG, etc) ***Guest Speaker:*** Nathan Cantrell – Meaningful Use Stages 1, 2, 3
	Assignments: Write a strategy or criteria's to select, buy and implement a patient management system.
10/27	***10. EXAM II:*** Chapter 5, 6, 7, 8, 9
	Guest Speaker:
11/3	*11. EHR Implementation* ⇒ Development and Deployment of EHR. ⇒ Technical Standards (ANSI) ⇒ Key questions to start EHR. Implementation ⇒ So you've decided to Buy an EHR… ⇒ By West Virginia eHealth Initiative White Paper - Electronic Health Record System Acquisition. Available at ⇒ http://www.wvhin.org/library/ Documents/Library/Reference%20Documents/wvehiwhitepaper%20final09.pdf ⇒ ANSI Standard ANSI/HL7 EHR, System Functional Model – Conformance Clause – Supportive Functions – Information Infrastructure Functions-2007 ⇒ Interview Questions Prior to EHR Implementation ***Guest Speaker:***
	Assignments: Select one health care facility (Ex: Hospital), Choose one section (Ex: RX) and design an strategy step by step to implement EHR on that section.

11/10	***12: Personal Health Records (PHR)*** ⇒ Definition, Policies and practices, legal requirements, safety patient, personalization, prescription, Medical decision and new challenges ⇒ Electronic Health Records: A Practical Guide for Professionals and Organizations. ⇒ By Margret K. Amatayakul, AHIMA. Available at http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_015872.pdf ***Guest Speaker:***
	Assignments: Prepare the Test Read the article and identify the key points: Hersh, W."A stimulus to define informatics and health information technology" BMC Medical Informatics and Decision Making. 9:24 (May 15,2009). Accessed July 6, 2012. http//www.biomedcentral.com/1472-6947/9/24.
11/17	***13 The Health Insurance Portability and Accountability Act of 1196 (HIPAA)***

	⇒ HIPAA **Term Paper Due** ***Guest Speaker:***
	Assignment: Assignment: Chapter 19 Health Informatics Exchange
12/2	***14 Case Study*** ⇒ West Virginia Health Information Technology Infrastructure: Broadband Availability for Health Care Programs in West Virginia" October 2011. ⇒ Managing transition from paper to electronic health records. ⇒ Security, Audits and Editing Electronic Health Information. ***Guest Speaker:***
12/8	***15. EXAM III: Chapter 11, 12, 13, 14, 15***

Marshall University
Syllabus Template

Course Title/Number	**HP 630- Research Methods and Data Analytics for Health Informatics(elective)** (3 hours)
Semester/Year	Spring 2015
Days/Time	Wednesday, 4:00 pm to 6:20 pm /3hours
Location	GH -
Instructor	**Girmay Berhie**
Office	GH 107
Phone	304-696-2718
E-Mail	berhie@marshall.edu
Web-page	webpages.marshall.edu/~berhie
Office/Hours	By appointment only on day of the class
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802 Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

Course Description: From Catalog

In this course, students will develop analytical and critical skills, and they will acquire knowledge in research process, from formulating questions to designing, collecting data, and interpreting results.

Course Student Learning Outcomes	How Practiced in this Course	How Assessed in this Course
Acquire research skills to apply in Health informatics	Video – Conference Case- studies Power point presentation Lecture Guest speaker Demonstration of software Benchmarking	Case study Papers Article critique Exam
Identify concepts, methods, tools and strategies to develop research in Health Informatics		
Develop analytical and critical skills to implement the best practices and leadership in research projects		
Biomedical research supported by Health Informatics	Case-studies in Biomedical sciences : Neuroscience and Developmental Biology – Toxicology and Environmental Health Sciences– Cardiovascular disease, Diabetes and Obesity- Infectious and immunological Diseases - Cancer Biology.	Case - Study Analysis

Required Texts, Additional Reading, and Other Materials

Handbook of Evaluation Methods for Health Informatics. Edition 1 Author Jytte Brender ISBN 13:978-0-12-370464-1 ISBN 10: 0-12-370464-2 PUB. DATE: December 21, 2005 PUBLISHER: Oxford
Designing and Conducting Mixed methods Research, 2nd. Edition Author John W. Creswell and Vicki L. Plano Clark ISBN-10: 1412975174 ISBN-13: 978-1412975179

PUB. DATE:
June 22, 2010

PUBLISHER:
SAGE

Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 3rd Edition.

Author
John W. Creswell

ISBN-10: 1412965578
ISBN-13: 978-1412965576

PUB. DATE:
July 15, 2008

PUBLISHER:
SAGE

Marshall Biomedical Sciences' Researchers Publish e-book on Nutrition and Cancer.

Course Requirements / Due Dates

CLS -105 Clinical Lab Terminology or previous background (undergraduate or courses related) in medical science.

Grading Policy

EXAMINATIONS AND TERM PAPER

There will be 2 examinations (Midterm and Final term) and assignments papers.

GRADES

Activities & Points		**Grades**
Exam 1:	20%	A: 90 – 100%
Exam 2:	20%	B: 80 – 89%
Term papers (project):	50%	C: 70 – 79%
Attendance:	10%	F: below 70%

Total	100%	

Attendance Policy

Students are expected to attend all classes. If it is necessary to be absent, from class the student is responsible for all assignments and materials covered in class. It will be necessary to obtain a fellow classmate's notes or have a classmate tape-record the lecture for you. It is the student's responsibility to make up deficits incurred due to absence from class and to do so in a timely manner. If there are questions or handouts, come and see the instructor as necessary.

Students will be expected to participate in all class activities. Outside assignments include preparation for classroom discussion. Assigned readings and unit objectives are to be completed prior to class time.

MAKE-UP TEST PROCEDURES

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Course Schedule

	Session 1 – Presentation and Introduction	**Date:**
Topics	Course requirements, syllabus, objectives, evaluation methods, and introduction lecture. Basic concepts in Evaluation, differences between methodology, method, technique and framework.	
Text	Handbook of Evaluation Methods for Health Informatics. Edition 1	
Assignment	Read Chapter 3 and 4 - Handbook of Evaluation Methods for Health Informatics. Edition 1 Two students has to select one example each one on the book section 2.4 Perspective and prepare a short presentation, with an analysis and critique to promote discussion, brainstorm and conclusions on the group.	
Guest speaker(s)		

	Session 2- Types of user assessment during the phases of a system's life cycle.	Date
Topic	Project life cycle. (explorative, technical development, adaptation and evolution phases)	
Text	**Handbook of Evaluation Methods for Health Informatics. Edition 1**	
Assignment	**Read Chapter 5 and 6**	
Guest speaker(s)		

Session 3 *– Overview of assessment methods*	Date

Topic	Assessment methods per phase (Explorative, technical development, adaptation and evolution)
Text	Handbook of Evaluation Methods for Health Informatics. Edition 1
Assignment	Read chapter 7 According to the professor criteria, students will prepare a short presentation, with a brief description of the method and technique, an analysis and critique to promote discussion, brainstorm and conclusions on the group.
Guest speaker(s)	

	Session 4 – Assessment methods	Date
Topic	Students presentations	
Text	NA	
Assignment	Read Chapter 3 – Choosing a mixed methods design - Designing and Conducting Mixed methods Research, 2nd. Edition	
Guest speaker(s)		

	Session 5*- Choosing a mixed methods design*	Date
Topic	Case study and examples Biomedical Science	
Text	**Designing and Conducting Mixed methods Research, 2nd. Edition**	
Assignment	**Read Chapter 6 – Collecting data**	
Guest speaker(s)		

	Session 6 – Collecting data in mixed methods research	Date
Topic	Collecting data Examples	
Text	**Designing and Conducting Mixed methods Research, 2nd. Edition**	
Assignment	**Read Chapter 7 – Analyzing and Interpreting Data**	
Guest speaker(s)		

	Session 7 – Analyzing and interpreting data in mixed methods research	Date
Topic	Analyzing and interpreting data Examples	

Text	**Designing and Conducting Mixed methods Research, 2nd. Edition**
Assignment	**Read Chapter 8 –Writing and evaluation mixed methods research**
Guest speaker(s)	

	Session 8- *Writing and evaluation mixed methods research*	Date
Topic	**Guidelines for writing, structure of a proposal, evaluation methods**	
Text	Designing and Conducting Mixed methods Research, 2nd. Edition	
Assignment	Write an abstract (2 pages) about one research topic related with Health Informatics. Prepare Exam	
Guest speaker(s)		

	Session 09- **Mid term Exam**	Date
Assignment	Read Part 1 Chapter 4 (Writing strategies and Ethical Considerations) - Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 3rd Edition	

	Session 10 – Writing strategies and Ethical Considerations	Date
Topic	Writing ideas and proposals Ethical Issues (Research, data collections, data analysis, interpretation and dissemination process) Examples	
Text	Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 3rd Edition	
Assignment	Read part II, chapter 6 The purpose Statement and chapter 7 Research Questions and Hypotheses	
Guest speaker(s)		

	Session 11- Purpose statement, qualitative and quantitative research questions	Date
Topic	Purpose statement examples Qualitative research questions examples Quantitative research questions examples	
Text	Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 3rd Edition	
Assignment	Read Part II chapter 8 Quantitative methods	
Guest speaker(s)		

	Session 12 – Quantitative methods	Date
Topic	Definitions, components of a survey, components of an experimental method plan, data analysis in Health Informatics. Examples	
Text	Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 3rd Edition	
Assignment	Read Part II chapter 9 Qualitative methods	
Guest speaker(s)		

	Session 13 – Qualitative methods	Date
Topic	Characteristics, data collection procedures, data recording, data analysis in Health Informatics. Examples	
Text	Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 3rd Edition	
Assignment	Using a research project or abstract related with Biomedical sciences (Neuroscience and Developmental Biology – Toxicology and Environmental Health Sciences– Cardiovascular disease, Diabetes and Obesity- Infectious and immunological Diseases - Cancer Biology). Prepare a presentation including an analysis and critique of: a. Statement and hypotheses b. Methodology c. Application of Health Informatics in data collection, data analysis and dissemination (including medical decision). d. Conclusions e. Writing f. Dissemination g. Ethical considerations	
Guest speaker(s)		

	Session 14- Final conclusions	Date
Topic	**Students presentations**	
Text	Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 3rd Edition	
Assignment	Prepare final exam	
Guest speaker(s)		

Session 15- Final Exam	Date