

College of Health and Human Services

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| **Syllabus for HAP 725: Statistical Process Improvement** |
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| Week  | Module | Assignments |
| 1  | Process Improvement  | Teach One Sign-up (by topic assignments) -You must sign-up for your presentation in the Google worksheet, during the first class.Case Study Assignment: You must identify which hospital and who in the hospital you plan to contact about your case study. You can do this through Linked In® web site. The same person should not be contacted by two students.Text Assignment: Text the instructor, during first class, and say “Hello”. Include your first and last name in the text. Linked In ® Assignment: Create a Linked In® page for yourself and connect with the instructorAdditional Week 1 AssignmentYou must submit these assignments by 11:55 PM, Sunday  |
| 2  | Probability and Probability Distributions  | Week 2 Assignment -You must submit this assignment by 11:55 PM, Sunday Teach One – Submit your presentation to your instructor for approval by 11:55 PM, Tuesday  |
| 3,4 | Risk Assessment & Patient Safety Indicators  | Assignment -You must submit this assignment by 11:55 PM, Sunday Case Study Progress – Organize what indicators you will focus on. Write to your sponsor about the indicators.Teach One – Submit your presentation to your instructor for approval by 11:55 PM, Tuesday |
| 5,6 | X-Bar control chart, Risk Adjusted X-Bar Control Chart  | Assignment -You must submit this assignment by 11:55 PM, Sunday Teach One – Submit your presentation to your instructor for approval by 11:55 PM, Tuesday  |
| 7 | Mid-term exam | Mid Term Exam – You will have 48 hours to complete this exam |
| 8,9 | P-charts, Risk Adjusted P-charts  | Assignment -You must submit this assignment by 11:55 PM, Sunday Case Study Progress – Organize the competitors and their data. Write to your sponsor about the competitors  Teach One – Submit your presentation to your instructor for approval by 11:55 PM, Tuesday  |
| 10,11  | Tukey Control Charts and Time Between Control Charts  | Assignment (1. Tukey & 2. Time between Charts)–You must submit this assignment by 11:55 PM, Sunday Teach One – Submit your presentation to your instructor for approval by 11:55 PM, Tuesday  |
| 12,13  | Benchmarking Clinicians  | Assignment -You must submit this assignment by 11:55 PM, Sunday Teach One – Submit your presentation to your instructor for approval by 11:55 PM, Tuesday  |
| 14 | Putting it all together  | Case Study Progress – Organize the data and starts your analysis  |
| 14 | Review session | Case Study End - You must submit this assignment by 11:55 PM  |
|  | Reading days |  |
| 15 | Final exam | Final Exam You will have 48 hours to complete this exam |

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| **Instructor**  | Farrokh Alemi, Ph.D. Office Hours by appointment. Please text 703 893 3799 between 9 am and 9 pm with your questions and concerns. Text for an online appointment at a convenient time for you.Read [more](https://chhs.gmu.edu/profile/view/3906) about Dr. Alemi. |
| **Course Description**  | Students focus on using data from electronic health records to improve health care. Students acquire a variety of knowledge and skills that prepare them to contribute to health care providers’ quality management efforts including: How to assess patient’s multi-morbidity risks, conduct risk-adjusted statistical process control analyses, and analysis of systemic failures contributing to adverse outcomes. Student learn about trends influencing the quality management system and the drivers for change, including measures used by CMS (including satisfaction, never-pay events, etc.) to strengthen value based payment.  |
| **Course Objectives**  | **Upon completion of the course, students will be able to:** 1. Understand the drivers for improvement in health care quality, safety and value
2. Integrate health data analytics and quality management methods in health care settings
3. Articulate how use of data supports the management and delivery of health care services
4. Merge data from multiple tables within electronic health records
5. Utilize CMS and AHRQs quality metrics using data from electronic health records to analyze health care provider performance and safety; including

(including Patient Safety Events and Indicators) 1. Analyze process outcomes using risk-adjusted statistical process control charts
2. Evaluate competing causes of outcomes and prepare causal control charts
3. Communicate analytical findings using narrated storyboards and data visualization. Plan efforts to assess patients' satisfaction or health status.
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| **Course Methodology**  | The class format will combine reading, lectures, presentations, and other learning tools. The class will be interactive and require every student to be engaged in the classroom discussion and assignments. In addition to the lectures, screencasts and timely completion of assignments, every student will be expected to be an avid consumer of health informatics industry trends, an active participant and a dedicated individual applying what you learn to every element of the course work. Students learn by teaching one assignment in the course to other students in the course.  |

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| **Required Textbook** | Big Data in Healthcare: Statistical Analysis of Electronic Health Record. [Amazon](https://www.amazon.com/Big-Data-Healthcare-Statistical-Electronic-ebook/dp/B083JVRQS6)  |
| **Course Grading**  | **Letter Grading Descriptions:** Listed below are grades and academic standards for each grade awarded.  **A = 96% and above** Clearly stands out as excellent work. An "A" grade work could be used as a model for other students to emulate. Shows excellent grasp of subject matter, conceptual integration, and excellent skills.  **A- = 90-95%** Represents high quality performance. Shows excellent grasp of subject matter and conceptual integration. Shows a high level of thinking, analysis, application, and very good skills.  **B+ = 86-89%** Represents very good work. Shows thorough grasp of subject matter and effective application. Shows good thinking, analysis, and good skills.  **B = 80-85%** Represents satisfactory work. Shows adequate level of thinking, analysis, and satisfactory skills.  **B- = 76-79%** Work is below graduate level expectations, skills are below expectation.  **C = 70-75%** Work is clearly unsatisfactory.  **F = 70% and below** Fails to meet minimum acceptable standards. |

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| **Computer Requirements** | This is a computationally intensive course and you are expected to access databases, software tools, and other contents. You will need: * Fast computer (multicore PC or Mac) with at least 100GB of free disk space and at least 8GB RAM (16GB recommended), Windows 10. Mac users may require more powerful computers to enable virtualization to run Microsoft Windows.
* Fast internet connection
* Microsoft office PowerPoint is required for narrations and presentations
* Assignments can be done using Microsoft SQL software, Excel, or Python
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| **Honor Code**  | *To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code:* **Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.** *(From the Catalog – catalog.gmu.edu)*  |
| **Individuals with** **Disabilities**  | **The university is committed to providing equal access to employment and educational opportunities for people with disabilities.**  Mason recognizes that individuals with disabilities may need reasonable accommodations to have equally effective opportunities to participate in or benefit from the university educational programs, services, and activities, and have equal employment opportunities. The university will adhere to all applicable federal and state laws, regulations, and guidelines with respect to providing reasonable accommodations as necessary to afford equal employment opportunity and equal access to programs for qualified people with disabilities. Applicants for admission and students requesting reasonable accommodations for a disability should call the Office of Disability Services at 703-993-2474. Employees and applicants for employment should call the Office of Equity and Diversity Services at 703-993-8730. Questions regarding reasonable accommodations and discrimination on the basis of disability should be directed to the Americans with Disabilities Act (ADA) coordinator in the Office of Equity and Diversity Services. *(From the 2017-18 Catalog – catalog.gmu.edu)*  |

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| **E-Mail Policy** | Mason uses electronic mail to provide official information to students. Examples include notices from the library, notices about academic standing, financial aid information, class materials, assignments, questions, and instructor feedback. Students are responsible for the content of university communication sent to their Mason e-mail account and are required to activate that account and check it regularly. Students are also expected to maintain an active and accurate mailing address in order to receive communications sent through the United States Postal Service. *(From the 2017-18 Catalog – catalog.gmu.edu)*  |
| **Course Evaluation**  | **Teaching – Learning Strategies** 1. Assignments, **20%**
2. Case Study, **10%**
3. Teach One Presentation**, 10%**
4. Mid Term Exam, **30%**
5. Final Exam, **30%** (can be waived in certain circumstances)
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| **Assignments** | Each week assignments are required to be uploaded to Blackboard. Assignments are due by **Sunday, 11:55 PM, ET** unless otherwise stated. Refer to the course schedule and weekly overviews for details. Assignments may have answer sheets posted in <http://openonlinecourses.com/spc/default.html> We are aware that assignments are time consuming and that most of your time will go to organizing the data and downloading the data. This is intentional. We want you to learn where the data are, what is within these files, how CMS uploads the data every year, what is the structure and format of the data, what is the meaning of the various variables and so on. The analysis of the data is a small part of what you learn in this course. |
| **Case Study** | In this project you compare the performance of an organization on multiple indicators with its competitors. You write to an individual within the organization and create a relationship. Details of what you write and when is provided in the instructions for the case study. |

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| **Teach One** **Presentation** | In this course, students will learn using the paradigm of learn one, do one, teach one. Each student is expected to not only learn the concepts in the course, and do the assignments, but also teach a portion of the course. We rely on a method typically used in training of medical residents: "Learn one, do one, teach one." The best way to learn a topic is to teach it. This active participation in teaching helps students learn the concepts in the course in more depth. Students who teach a topic have a deeper understanding of the material. Students select which topic they wish to teach. They can teach about any aspect within the topic. Typically, students teach how to do a particular assignment. They should select an assignment that does not currently have an effective Teach One. Students are expected to teach by preparing a brief video. Student's videos should be reviewed by the instructor prior to release to others and should be released to others prior the topic being discussed in class. In general, posting the video online establishes your professional credentials and is encouraged by the instructor and the program. Some students may have reservations. Students who do not wish for their video to be posted publicly should contact the instructor for an alternative (e.g. private posting). These alternatives include posting under an alias and/or posting and removing the video after class ends.As part of the teaching, in the start of the week that assignment is due, during class time, the student-teacher will help a small group of students do the assignment. During these small group sessions, one student will try to do the assignment and the student teacher will offer help and advice. The grade for teach one assignment depends on how many students in the class find the efforts of the student teacher as helpful.  |
| **Mid Term Exam**  | This is an open book, open internet exam. You will have 48 hours to complete it beginning at **8am on Thursday**. In order to complete your exam you will be required to download the word or Excel file and answer each question. Then upload the file back into Black Board. Submit one file. Submit through Blackboard. One submission is allowed.  |
| **Final Exam** | This is an open book, open internet exam. You will have 48 hours to complete it**.** In order to complete your exam you will be required to download the Excel file and answer each question within one sheet of Excel. Then, upload the Excel file back into Blackboard. Submit one file. Submit through Blackboard. One submission is allowed.  |