I. Course Information

**Course Name:** Health Data and Electronic Health Records (EHRs)

**Course Number:** RHIN 115

**Course Start and End Dates:** October 8th - December 17th, 2019

**Instructor:** Paul Reitano

**Office Hours:** Ad Hoc – Email to coordinate times

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**Document Overview**

This syllabus contains all relevant information about the course: its objectives and outcomes, the grading criteria, the texts and other materials of instruction, and of weekly topics, outcomes, assignments, and due dates.

Consider this your roadmap for the course. Please read through the syllabus carefully and feel free to share any questions that you may have. Please print a copy of this syllabus for reference.

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**Course Description**

This course is designed to provide current and aspiring health/medical IT professionals with an understanding of the challenges of collecting and maintaining electronic health data. The course focuses on issues specific to health data and the systems implemented to collect and store it. This includes an overview of various types of hospital systems; methods used to interface between systems; and operations issues typical of hospital systems. The course also includes a study of controlled medical vocabularies typically used to define various types of health data as well as a survey of existing and evolving government driven standards and regulations.

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**Course Outcomes**

**After taking this course, each student will be able to:**

1. Diagram the data flow in existing healthcare environments.
2. Identify the most appropriate interface methods between both internal and external health information systems.
3. Develop an understanding of current standard in health and medical informatics.
4. Identify key technical considerations and hurdles in the implementation of an EHR
5. Evaluate current and proposed regulations impacting electronic health data.
6. Distinguish when it is appropriate to utilize a controlled medical vocabulary (CMV) and which CMV is appropriate for a given situation
Relevant Programs:
MS in Health/Medical Informatics
MS in Information Technology Management

Prerequisites
RHIN-110 Perspectives on Health and Medical Information Systems or permission of instructor

Materials of Instruction

Textbooks

Required/Recommended Software: NA

Recommended Text(s) / Journals: NA

Online Course Content
This section of the course will be conducted completely online using Brandeis’ LATTE site, available at http://moodle2.brandeis.edu. The site contains the course syllabus, assignments, discussion forums, links/resources to course-related professional organizations and sites, and weekly checklists, objectives, outcomes, topic notes, self-tests, and discussion questions. Access information is emailed to enrolled students before the start of the course. To begin participating in the course, review Week 1 and read the first Course Announcement.

- Students will be provided with PDF copies of additional course material and links to relevant material, if required.

Welcome Message from the Instructor
[See Posted Course Welcome Message]

Course Grading Criteria
Note there will be opportunities to complete optional assignments in addition to those listed below with extra credit given at the discretion of the instructor.

<table>
<thead>
<tr>
<th>Percent</th>
<th>Component</th>
<th>Outcomes</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>Discussions/On-line participation</td>
<td>2-6</td>
<td>Weekly</td>
</tr>
<tr>
<td>10%</td>
<td>Library Exercise</td>
<td>3</td>
<td>Week 2</td>
</tr>
<tr>
<td>15%</td>
<td>Case Study 1: Mount Auburn CPOE</td>
<td>3-5</td>
<td>Week 4</td>
</tr>
</tbody>
</table>
Online Discussions and Rubric

Online discussions should be completed during the course week in which they are assigned. Early or late discussion posts do not earn credit. Your first post should be made by Saturday midnight of each course week; following posts should be made by Tuesday midnight. You are expected to post on at least three different days of the course week. Unless stated otherwise, you should expect to post substantive answers to each discussion question and at least two responses to a post from another student (3 to 4 substantive posts per week). A substantive post is one that is about 150-250 words, and which makes a useful point or asks a useful question. Posts which are poorly written, which merely quote from external sources, or which merely echo agreement or disagreement with another post will not earn credit. Participation beyond these minimum requirements will earn additional credit.

<table>
<thead>
<tr>
<th>Question Responses</th>
<th>60% of weekly participation grade</th>
<th>Max. Points per criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Includes your own insights into the topics, sharing your professional experiences as appropriate and your own conclusions</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Includes references to weekly required readings and/or other external sources, cited appropriately. All original responses must draw on external references</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Answers the question posed completely; poses questions or points of consideration to elicit responses from classmates</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Consists of at least 250-300 words</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Well written, with no spelling or grammatical errors, and with the care normally exercised for the student’s professional communications</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>One day late:</td>
<td>-15 out of 30 possible raw points; more than one day late: no credit</td>
<td></td>
</tr>
</tbody>
</table>

Discussion Replies

30% of Weekly Participation Grade

Max. Points per criteria
**Substantive** (beyond an "I agree" or complimentary post) with:
- Follow-on points from your related experiences and/or from the readings
- Consists of at least 200 words
- Follow-up questions of others to extend the conversation (encouraged, but not required)

**Grammar/spelling/format/sources** noted as appropriate

<table>
<thead>
<tr>
<th>Posting Activity</th>
<th>10% of Participation Grade</th>
<th>Max. Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post the minimum number of required posts on three or more days of the course week</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Post the minimum number of required posts on two days of the course week</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Post any number of posts on one day of the course week</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**Assignment Descriptions**

**Assignment 1**: Library Exercise

Students will use OneSearch to locate a scholarly article pertaining to Health Informatics. Students should summarize the article in 300-400 words, outlining why they are interested in the chosen article/topic. This exercise helps students familiarize themselves with an underutilized resource.

**Assignment 2**: Case Study 1: Mount Auburn CPOE

Students will work in pairs or groups to read and present an analysis of the Harvard Business School case study: Mount Auburn Hospital: Physician Order Entry.

**Assignment 3**: Case Study 2: Concerns and Workarounds with a Clinical Documentation System

Students will work in pairs or groups to read and present an analysis of Case Study 7 from the textbook.

**Final Assignment**: Event Notification Integration with EHR

City Hospital is implementing a software that alerts clinical and ancillary staff within the EHR when a subset of patients arrives in the Emergency Department or is Directly Admitted for inpatient care. Detail implementation plan, including training, decision points, interfaces/integration considerations, data flow, and support.

**II. Weekly Information & Assignment Outline**

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Health and Medical Data</th>
<th>July 17-23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives</td>
<td>Identify the different types of data found in a healthcare organization</td>
<td></td>
</tr>
</tbody>
</table>
| Learning Materials | • Week 1 Topic Notes  
|                    | • Text - HCIS Chapter 1  
| Discussions       | Initial Response is due Saturday, a minimum of 2 replies are due Tuesday  
| Assignments       | • None  
| Week 2            | Computerized Systems in Health Care  
|                   | July 24-30  
| Objectives        | • Differentiate between clinical and administrative data.  
|                   | Understand the purpose of each.  
|                   | • Identify the organizational elements needed to support health care systems  
|                   | • Diagram data flow between clinical systems  
|                   | • Distinguish the difference between best-of-breed and monolithic system configurations  
| Learning Materials | • Week 2 Topic Notes  
|                   | • HCIS Chapter 3  
| Discussions       | Initial Response is due Saturday, a minimum of 2 replies are due Tuesday  
| Assignments       | • Library Exercise  
| Week 3            | Electronic Health Records – Part I  
|                   | July 31 - Aug 6  
| Objectives        | Examine the history of EHR’s and the summarize the movement away from paper records  
|                   | Define the basic components of the EHR  
|                   | Identify users and stakeholders in an organization with an EHR  
| Learning Materials | • Week 2 Topic Notes  
|                   | • HCIS Chapter 3  
|                   | • A Cost-Benefit Analysis of Electronic Medical Records in Primary Care  
| Discussions       | Initial Response is due Saturday, a minimum of 2 replies are due Tuesday  
| Assignments       | • Case Study 1 Assigned  
| Week 4            | Electronic Health Records – Part II  
|                   | Aug 7 - 13  
| Objectives        | • Define the data elements typically found in an EHR  
|                   | • Examine the rationale for EHR implementation  
|                   | • Identify often-cited reasons for slowness in EHR adoption  
| Learning Materials | • Week 4 Topic Notes  
|                   | • HCIS Text - Chapter 5  
| Discussions       | • Saturday  
| Assignments       |
| Discussions | Initial Response is due Saturday, a minimum of 2 replies are due Tuesday | ● Saturday  
● Tuesday |
<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>● Case Study 1 Due</td>
<td>● Tuesday</td>
</tr>
<tr>
<td>Week 5</td>
<td>EHR Implementation</td>
<td>Aug 14 - 20</td>
</tr>
</tbody>
</table>
| Objectives  | ● Define the project lifestyle of a large-scale EHR implementation  
● Identify common challenges presented by complex installations  
● Be able to propose mitigation plans to prevent scope creep | |
| Learning Materials | ● Week 5 Topic Notes  
● Reading - HCIS Chapters 6  
● HCIS Case Study 9: Strategies for Implementing CPOE (pg 492)  
● Transitioning from Best of Breed to Monolithic | ● Saturday |
| Discussions | Initial Response is due Saturday, a minimum of 2 replies are due Tuesday | ● Saturday  
● Tuesday |
| Assignments| ● None | |
| Week 6      | Interfaces/Interoperability | Aug 21 - 27 |
| Objectives  | ● Describe current interface methods used by health care organizations  
● Identify benefits and challenges posed by interfaces  
● Apply knowledge of HL7 to construct common interface configuration  
● Determine effective design for health care organization interface architecture | |
| Learning Materials | ● Week 6 Topic Notes  
● BMC HL7 Quick Start Guide [https://drive.google.com/open?id=1fpSnV0kfRwrpSQ4lm0cj4246bRuW_Uxmv](https://drive.google.com/open?id=1fpSnV0kfRwrpSQ4lm0cj4246bRuW_Uxmv)  
| Discussions | Initial Response is due Saturday, a minimum of 2 replies are due Tuesday | ● Saturday  
● Tuesday |
| Assignments| ● Case Study 2 Assigned | |
| Week 7      | EHR Support and Portfolio Prioritization | Aug 28 - Sep 3 |
| Objectives  | ● Identify common support infrastructure and enhancement cycles | |
- Develop portfolio management processes to effectively address high-volume request queues
- Develop skills to foster IT and clinical end user relationships

| Learning Materials | Week 7 Topic Notes | HCIS Text - Chapter 13 | Saturday

| Discussions | Initial Response is due Saturday, a minimum of 2 replies are due Tuesday | Saturday, Tuesday

| Assignments | Case Study 2 Due | Tuesday

### Week 8
**Regulatory/Government Perspectives on Health Care Data**
Sep 4 - 10

| Objectives | Evaluate Meaningful Use and its influence on the current EHR ecosystem
- Review current state of government programs and their impact on Hospital IT agendas/portfolios
- Identify resources and skills needed to maintain regulatory compliance


| Discussions | Initial Response is due Saturday, a minimum of 2 replies are due Tuesday | Saturday, Tuesday

| Assignments | None |

### Week 9
**Data Standards and Controlled Medical Vocabularies**
Sep 11 - 17

| Objectives | Identify standards in health care data
- Illustrate the purpose for using Controlled Medical Vocabularies
- Effectively group and present collections of data to end users

| Learning Materials | Week 9 Topic Notes | Reading - HCIS Chapter 11
- Reading - Medical Terminologies: [http://www.openclinical.org/medicalterminologies.html](http://www.openclinical.org/medicalterminologies.html)
- Reading: [Prioritization and Refinement of Clinical Data Elements within EHR Systems](http://www.openclinical.org/medicalterminologies.html)

| Discussions | Initial Response is due Saturday, a minimum of 2 replies are due Tuesday | Saturday, Tuesday

| Assignments | Final Project Assigned |

### Week 10
**Use of EHR Data**
Sep 18 - 24

| Objectives | Comprehend uses for health data outside generated in EHR: reporting, policy, research, operations
- Analyze the relationship between data input and the quality of related output and/or outcomes

| Learning Materials | Week 10 Topic Notes
- [Opportunities and Challenges related to the use of Electronic Health Records data for research](http://www.openclinical.org/medicalterminologies.html) | Saturday
III. Course Policies and Procedures

Late Policies
Assignments are due by the end of the relevant course week. For example, The Library Exercise is due at the end of week 2. In fall 2018, this will be just after 11:59pm on Tuesday, October 23. To avoid any problems caused by confusion over dates and times, I set assignment deadlines to be 6am on the following Wednesday. This gives you an automatic six-hour grace period for each assignment. If an assignment is late, it will lose 5 points for every day it is late. Continuing with this example, if the first assignments is submitted after 6am but before midnight on Feb. 5, it will lose 5 points. Submission by midnight on Feb. 6 loses 10 points. If an assignment is more than a week late, I will not accept it for credit. I do this so that I will have an opportunity to discuss the assignments and possibly post reference solutions to help the class.

Brandeis and its servers run on Eastern Time. If you are in another time zone, the times you see in Latte are not converted to your local time unless you change your preferences. Due dates and times always reflect Standard Time or Daylight-Saving Time when these are observed in Massachusetts. Note that Brandeis will change from Eastern Daylight Time to Eastern Standard Time during this semester.

Grading Standards
- Work expectations – Students are responsible to explore each week's materials and submit required work by their due dates. On average, a student can expect to spend approximately 3-5 hours per week reading and approximately 5-8 hours per week completing assignments and posting to discussions.
- How points and percentages equate to grades

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-94</td>
<td>A</td>
</tr>
<tr>
<td>93-90</td>
<td>A-</td>
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<tr>
<td>89-87</td>
<td>B+</td>
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<tr>
<td>86-83</td>
<td>B</td>
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<tr>
<td>82-80</td>
<td>B-</td>
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<td>79-77</td>
<td>C+</td>
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<td>76-73</td>
<td>C</td>
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<tr>
<td>72-70</td>
<td>C-</td>
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<td>69-67</td>
<td>D+</td>
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<td>66-63</td>
<td>D</td>
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<tr>
<td>62-60</td>
<td>D-</td>
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<td>59 or &lt;</td>
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Feedback
My goal is to grade homework within a week of the due date. I will post an announcement if I am delayed in grading for some reason. If you submit an assignment late, I usually grade it after the following assignment is due, so that my feedback is timely for the greatest number of students.
If you have questions about assignments, the most reliable private way to reach me is via the One on One Discussion forum. If your question will help the entire class, I may take the liberty of answering it via the Questions and Answers forum.

If you send me a message at my Brandeis email address, I normally respond within 24 hours of receiving it. However, email may be delayed several days.

Confidentiality

- We can draw on the wealth of examples from our organizations in class discussions and in our written work. However, it is imperative that we not share information that is confidential, privileged, or proprietary in nature. We must be mindful of any contracts we have agreed to with our companies. In addition, we should respect our fellow classmates and work under the assumption that what is discussed here (as it pertains to the workings of particular organizations) stays within the confines of the classroom. See Discussion Post Ground Rules above for more.

- Finally, for your awareness, members of the University's technical staff have access to all course sites to aid in course setup and technical troubleshooting. Program Chairs and a small number of Graduate Professional Studies (GPS) staff have access to all GPS courses for oversight purposes. Students enrolled in GPS courses can expect that individuals other than their fellow classmates and the course instructor(s) may visit their course for various purposes. Their intentions are to aid in technical troubleshooting and to ensure that quality course delivery standards are met. Strict confidentiality of student information is maintained.

Class Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Start/End Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sept 14-20</td>
</tr>
<tr>
<td>2</td>
<td>Sept 21-27</td>
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<tr>
<td>3</td>
<td>Sept 28-Oct 4</td>
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<tr>
<td>4</td>
<td>Oct 5- Oct 11</td>
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<tr>
<td>5</td>
<td>Oct 12 - Oct 18</td>
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<tr>
<td>6</td>
<td>Oct 19 - Oct 25</td>
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<tr>
<td>7</td>
<td>Oct 26 - Nov 1</td>
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<tr>
<td>8</td>
<td>Nov 2 - Nov 8</td>
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<tr>
<td>9</td>
<td>Nov 9 - Nov 15</td>
</tr>
<tr>
<td>10</td>
<td>Nov 16 - Nov 22</td>
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</tbody>
</table>
Time Management
Students sometimes run into problems related to managing their time, especially in distance learning courses. I hope these ideas will help you to succeed in the class:

- If you are employed full-time, do not take more than two courses at a time. I have never met a student who could successfully manage this, especially toward the end of the term as finals and projects come due.
- Keep up with the course week-to-week. Don’t let yourself fall behind on readings, discussion posts, etc. Brandeis courses are not self-paced, and they depend on the collaboration of everyone. Participating late, or “trying to get ahead” is very disruptive.
- Take a look at course assignments early in the week and consider how you will approach the solutions. Ask questions early, so I have time to answer them. Don’t wait until Tuesday night to begin work.
- If you are planning a vacation, plan to continue participating in the class. Thanks to LATTE, you can post discussions and submit homework from virtually anywhere in the world. I will not be able to accept homework late because of a scheduled vacation.
- If you do find yourself short of time, remember that discussion posts count for 30% of your grade. Do not forgo discussions, because it’s impossible to complete the course successfully without them.
- If you experience a serious situation, such as a severe illness, contact me as soon as you can, or contact the GPS office.

IV. University & Division of Graduate Professional Studies Standards

Please review the policies and procedures of Graduate Professional Studies, found here: http://www.brandeis.edu/gps/students/studentresources/policiesprocedures/index.html

Accessibility and Accommodations
Brandeis seeks to welcome and include all students. If you are a student who needs accommodations as outlined in an accommodations letter, please communicate with me and present your letter of accommodation as soon as you can. I want to support you.

In order to provide accommodations, I need the letter more than 48 hours in advance. I want to provide your accommodations, but cannot do so retroactively. If you have questions about documenting a disability or requesting accommodations, please contact Student Accessibility Support (SAS) at 781.736.3470 or access@brandeis.edu.

Academic Honesty and Student Integrity
Academic honesty and student integrity are of fundamental importance at Brandeis University and we want students to understand this clearly at the start of the term. As stated in the Brandeis Rights and Responsibilities handbook, “Every member of the University Community is expected to maintain the highest standards of academic
honesty. A student shall not receive credit for work that is not the product of the student’s own effort. A student’s name on any written exercise constitutes a statement that the work is the result of the student’s own thought and study, stated in the student’s own words, and produced without the assistance of others, except in quotes, footnotes or references with appropriate acknowledgement of the source." In particular, students must be aware that material (including ideas, phrases, sentences, etc.) taken from the Internet and other sources MUST be appropriately cited if quoted, and footnoted in any written work turned in for this, or any, Brandeis class. Also, students will not be allowed to collaborate on work except by the specific permission of the instructor. Failure to cite resources properly may result in a referral being made to the Office of Student Development and Judicial Education. The outcome of this action may involve academic and disciplinary sanctions, which could include (but are not limited to) such penalties as receiving no credit for the assignment in question, receiving no credit for the related course, or suspension or dismissal from the University.

Students may be required to submit work to TurnItIn.com software to verify originality. TurnItIn is a tool that compares student assignment submissions to internet sources and a comprehensive database of other papers. It creates a report that provide a link to possible matches and a “similarity score”. TurnItIn does not determine whether a paper has been plagiarized; individual faculty will make that judgment. All papers submitted to TurnItIn are kept in a separate reference database of Brandeis work, to be used solely for the purpose of detecting plagiarism in the future. Students retain copyright on their original course work. Allegations of alleged academic dishonesty will be forwarded to the Director of Academic Integrity. Sanctions for academic dishonesty can include failing grades and/or suspension from the university. Citation and research assistance can be found at Library guides.

Further information regarding academic integrity may be found in the following publications: "In Pursuit of Excellence - A Guide to Academic Integrity for the Brandeis Community", "(Students') Rights and Responsibilities Handbook", AND "Graduate Professional Studies Student Handbook". You should read these publications, which all can be accessed from the Graduate Professional Studies website. A student that is in doubt about standards of academic honesty (regarding plagiarism, multiple submissions of written work, unacknowledged or unauthorized collaborative effort, false citation or false data) should consult either the course instructor or other staff of the Rabb School Division of Graduate Professional Studies.

**University Caveat**

The above schedule, content, and procedures in this course are subject to change in the event of extenuating circumstances. If you have questions or concerns about course content before the start of the course, please contact the instructor.

V. Grading Rubrics

<table>
<thead>
<tr>
<th>Grading Rubric for Assignments</th>
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</thead>
<tbody>
<tr>
<td>A, A- (90-100)</td>
</tr>
<tr>
<td>B+, B, B- (80-89)</td>
</tr>
<tr>
<td>C+, C, C- (70-79)*</td>
</tr>
<tr>
<td>D+, D, D-, F (69 or below)*</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Submitted Complete Assignment</th>
<th>Assignment is complete and follows all instructions</th>
<th>Assignment is complete but does not follow all instructions</th>
<th>Assignment is not complete or does not follow instructions</th>
<th>Assignment is not complete or does not follow instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>References to Course Readings and Concepts</td>
<td>Makes clear connections to class materials, methods, and concepts with substantial additional research.</td>
<td>Makes connections to class materials, methods, and concepts with some additional research.</td>
<td>Makes connections to class materials, methods, and concepts but with little additional research. Cites some sources used according to APA or MLA guidelines.</td>
<td>Fails to connect to class materials, methods, or concepts or conduct additional research.</td>
</tr>
<tr>
<td>Original Thought and Professional Experience</td>
<td>Contains relevant and fully developed new ideas. Incorporates professional experiences.</td>
<td>Contains rich and fully developed new ideas, or professional experience but lacks depth or detail</td>
<td>Contains few, if any, new ideas; often a rehashing or summary of other comments</td>
<td>No new ideas</td>
</tr>
<tr>
<td>Written and Visual Presentation</td>
<td>No grammar or spelling errors. Excellent visual presentation, no inconsistency. Cites all sources using APA or MLA guidelines.</td>
<td>Few grammar errors, no spelling errors. Strong visual presentation, no inconsistency. Cites all sources using APA or MLA guidelines.</td>
<td>Some grammar and/or spelling errors. Good visual presentation, little inconsistency. Cites some sources using APA or MLA guidelines.</td>
<td>Many grammar and/or spelling errors. Poor visual presentation and/or a lot of inconsistency. Does not cite any sources, or properly cite the sources.</td>
</tr>
</tbody>
</table>

*Anything grade below an 80 in a Brandeis GPS course is a failing grade, including the overall course grade.*