**Department of Business Administration**

Kevin Fernandez, MBA, MS, EJD

**Course Name:** CapstoneBig Data & Business Analytics

**Course Number: DS 670**

**COURSE SYLLABUS**

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|  | 2/27/23 – 5/1823Class time: Online Meetings Tuesdays 06:00PM - 09:25PM **Classroom**: Physical Room / Zoom Online  **Office Hours:** By appointment |
| Kevin Fernandez, MBA, MS, EJD |  |

**Course Objectives and Description**

In this course students will apply their skills, knowledge and experience acquired in previous courses in the M.S. in Data Science program to solve problems, offer solutions or improve existing achievements for industry, governmental or NGO sector. Students will be using real-world data and state-of-the-art data

science tools. The project within this course combines analytical, statistical, engineering, communication, project management and presentation tasks. Students will work in teams of two or three people. Teams are formed based on each student’s background, experience, skills, and considering his/her interests. Each team selects one topic for the project out of the list of topics.

Teams give presentations of the project progress in class as a part of the three assignments, that should take approximately 20-30 minutes, followed by questions and discussion with professor and other students. You must ensure that every team member equally participates in the project implementation and communicates the project progress in class.

Students have four assignments followed by four in class presentations, that are partial and final results demonstrating their project progress. Evaluation of assignments is based on the quality and depth of research, originality of idea and innovation of approach, visual and oral quality of the presentation, participation in discussion and answering questions. All homework assignments are worth the same number of percentage. Late presentations are not accepted, though, students are allowed to submit a late assignment in Blackboard with a 50% reduction in grade. Without an in-class presentation (without a serious reason for

missing a class, such as sickness, transport accident etc.), the assignment submission is worth 50% of the initial grade.

For the midterm exam students write original paper synthesizing literature review and analysis, and upload it in Blackboard. Students should review approximately 20-50 literature sources. This includes peer-reviewed articles, books, dissertations, conference papers etc. For the final exam students write final original paper, comprised of literature review and problem, methods and data, results, conclusions and discussion, references, and upload it in Blackboard. The approximate length of the final original paper is 10-25 pages, though, the approximate length of the original paper synthesizing literature review and analysis is 2-5 pages.

All course assignments and exams are graded on a 0-100% basis. Detailed assignment instructions are given during the lecture. The final grade is comprised of assignments (50%), midterm exam (20%), and final exam (30%).

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**Learning Outcomes**

After taking this course, students should have a better data scientist’s or research scientist’s background, demonstrating their ability to develop a project plan, manage the project, implement a high-quality research by using cutting-edge data science methods and tools. Working with real-world data for solving industry, governmental or NGO problems will add a big value to the student’s portfolio. Students are encouraged to present their capstone research at conferences and/or in peer-reviewed journals.

**Textbooks:** I recommend the following book for midterm and final exams: *Strunk W. The Elements of Style, 2018 (*or earlier editions).

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**Calendar**

|  |  |  |  |
| --- | --- | --- | --- |
| **Classroom-Online Thursday** | **Weekly Schedule and Assignment** | **In-class Presentation Due** | **Assignments**  **uploaded in**  **Blackboard Due** |
| Week 1: Feb 28 | Syllabus review. Team and topic selection for the project.  Assignment #1: Literature review, analysis and problem definition. |  |  |
| Week 2: Mar 7 | Data preprocessing. Imputation of Missing Values. Feature Engineering. Imbalanced Data. Resampling.  In class presentations of Assignment #1.  Assignment #2: Data preprocessing and exploratory data analysis. |  |  |
| Week 3: Mar 14 | Check in – Assignment #2 (progress discussion). |  |  |
|  | Modeling Techniques. Text Data. Time series data. Convolutional Neural Networks for Image  Recognition. Advanced Neural Networks.  In class presentations of Assignment #2.  Assignment #3: Modeling. Application of project results. | Mar 14 | Mar 20 |
| Week 4: Mar 21 | Midterm. Original paper synthesizing literature review and analysis due.(2-4 pages) |  | Mar 27 |
| Week 5: Mar 28 | Check in – Assignment #3 (progress discussion). |  |  |
| Week 6: Apr 4 | Check in – Assignment #3 (progress discussion). |  |  |
| Week 7: Apr 11 | Prototyping. Design Thinking. Communication and reporting project results. Data visualization.  In class presentations of Assignment #3.  Assignment #4: Final project presentation and working prototype. |  |  |
| Week 8: Apr 18 | Check in – Assignment #4 (progress discussion). |  |  |
| Week 9: Apr 25 | In class presentations of Assignment #4: Final project presentation and working prototype. |  |  |
| Week 10: May 2 | Check in – Final Exam. |  |  |
| Week 11: May 9 | Final Exam (Presentation). Final original paper due, with visualizations, tables, literature references and other relevant  materials. (20 pages) |  | May 9 |

**Assignments and Grade Breakdown**

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| --- | --- | --- | --- |
| **Assignment Type** | **#** | **Description** | **% of Grade** |
| Assignments | 3 | Students have 4 assignments followed by 4 in class presentations. Presentation of assignment #1 should take approximately 10 minutes, and presentations of assignments #2-4 should take approximately 20-30 minutes, followed by questions and discussion with professor and other  students. Assignments 1-3 are 10% of the final grade each, and assignment 4 is 20% of the final grade. See calendar for due dates regarding in class presentations and assignment submissions. | 35 |
| Midterm Exam | 1 | Students write original paper synthesizing literature review and analysis. Approximate length of the paper 2-5 pages. | 25 |
| Final Exam- Presentation | 1 | Students write final original paper, comprised of literature review and problem, methods and data, results, conclusions and discussion, and references. Approximate length of the paper 10-25 pages. | 25 |
| Attendance |  |  | 15 |
| Final Grade |  |  | 100 |

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**Performance Evaluation Criteria**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Grade | | Numeric Grade | QP |  | Grade | | Numeric Grade | QP |
| A | Outstanding | 94 to 100 | 4.0 |  | C | Satisfactory | 70 to 74 | 2.0 |
| A- | Excellent | 90 to 93 | 3.7 |  | C- | Barely Satisfactory | 66 to 69 | 1.7 |
| B+ | Very Good | 86 to 89 | 3.3 |  | D+ | Poor but Passing | 62 to 65 | 1.3 |
| B | Good | 83 to 85 | 3.0 |  | D | Minimum for credit | 60 to 62 | 1.0 |
| B- | Above average | 79 to 82 | 2.7 |  | F | Failure for a course | 59 or below | 0.0 |
| C+ | Average | 75 to 78 | 2.3 |  |  |  |  |  |

*FA = Faculty members have an option of giving an FA to those who made no show on blackboard.*

**Attendance:**

Students are expected to attend/access all scheduled remote classes regularly/weekly. Please arrive on time to the physical / remote class meeting. If you arrive late, please enter quietly within the maximum first 10 minutes. It is not appropriate to leave the class during the period except for emergencies.

**Technical Requirements:**

Students need to be able to perform the following technical skills:

* Employ the use of a smartphone, tablet, laptop or desktop computer to complete coursework
* Login to Blackboard to access course materials and complete assignments
* Send and receive emails via Saint Peter’s University Peacock Mail (Gmail)
* Use Google Apps and Web 2.0 tools to complete course activities and assessments
* Use the Google Chrome browser and install/use Chrome extensions

**Cell Phones, PDAs, Other Devices (Classroom Etiquette)**

Cell phones, personal digital assistants, and other devices such as laptops should be turned off in the classroom.

**Accessibility and Accommodations**

Please let me know at the beginning of the semester about any learning accommodations you need, and make sure you have the appropriate paperwork from the Academic Dean’s Office.

Saint Peter’s Faculty is responsible for providing access to education which is free from discrimination. Students apply for academic accommodations by submitting the appropriate forms to the Center for Academic Success and Engagement. Academic accommodations are approved based on a student’s individualized needs. For more information please visit the [Accommodations and Services](https://www.saintpeters.edu/academics/programs-services/disability-services/accommodations-and-services/) webpage.

**Plagiarism, Cheating and Computer Piracy**

Violations of professional ethics will not be tolerated. This includes plagiarism, cheating, or false attendance. If a student is suspected of such behavior, standard University policy will be used to deal with the specific situation (see the Please review the [Student Code of Conduct](https://catalogs.saintpeters.edu/handbook/studentcodeofconduct/).). It is considered plagiarism to use online sources, texts, other students’ work, etc. as your own work, so you MUST quote and cite all your references and put phrases in your own words to avoid unintended plagiarism of Internet and other sources.

**Online Etiquette and Anti-Harassment Policy**

The use of University sponsored emails, portals as well as information and material accessed on the Saint Peters network should be in keeping with University values and Student Code of Conduct. University guidelines for responsible use of technology can be found in the [Student Handbook](https://catalogs.saintpeters.edu/handbook/collegepoliciesandprocedures/distancelearning/).

**Student Support Services**

If you need any additional help, please contact TRiO Student Support Services: <https://www.saintpeters.edu/academics/programs-services/trio/>

**TITLE IX Compliance**

In the event that you choose to write or speak about having survived sexualized violence, including rape, sexual assault, dating violence, domestic violence, or stalking, Saint Peter’s University policies require that, as your instructor, I share this information with the Title IX Coordinator, Elena Serra. Elena or a trained member of her team will contact you to let you know about support services at Saint Peter’s as well as options for holding accountable the person who harmed you. Whereas you are not required to speak with them, they will share resources with you.

**Student responsibility and obligations**

Students are expected to actively participate and complete all assignments and present by the due dates.

**Instructional Continuity Plan**

For classes that normally entail meeting face-to-face, the continuity plan will be in place by including some synchronous course activities if access to campus is restricted for more than one week. Also, the use of Blackboard is mandatory and the only LMS that should be used for all SPU classes is SPU's Blackboard.

Good luck and I hope we will enjoy the class together while learning.

Kevin Fernandez, MBA, MS, EJD