

DATA SCIENCES AND OPERATIONS

(Fall 2023 – first half of the semester)

DSO 599 – Healthcare Analytics

Section – TBD

Professor

Cosimo Arnesano

Email

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When

Monday, 6:30 PM – 9:30 PM

Office

BRI 303E

Units

1.5



WHY TAKE THIS COURSE?

Students who plan to have a career in Business Analytics and interested in knowing more about how to apply analytics skillset and methodologies to solve challenging problems in the healthcare industry should take this course. Students who want to learn how to identify innovative uses of data to solve healthcare management problems, understand key industry metrics, and guide professional decision-making should take this course.

COURSE OBJECTIVES

1. Introduce the basics of healthcare analysis related to clinical and health outcomes, research and development, value vs. cost, financial performance, risk analysis, and more.
2. Describe the basics of the healthcare ecosystem including key constituents and shareholders, and their goals from the perspective of various disciplines.
3. Empower students to research and analyze real healthcare data using a variety of software platforms and formulate business recommendations.

KEY CONCEPTS

Business Analytics
 US Healthcare ecosystem
 R programming
 Python programming
 JMP and Excel analytics tools
 Machine Learning
 Artificial Intelligence in Medicine
 Financial Performance
 Risk Management
 Research and Development
 Consumer Insights
 Fee-for-service approach
 Value-based care approach

COURSE DESCRIPTION

The healthcare industry is changing rapidly due to technological changes, regulatory changes, demographic shifts, and changes in consumer expectations. This course helps graduate students understand the basics of healthcare analytics, the challenges, the opportunities, and separate what is real and what is speculation and hype. This is a hands-on class where students will be analyzing real healthcare data and then presenting their actionable business strategy insights and recommendations. Students will be working on projects and other assignments both individually and in groups.

DSO-599 – Healthcare Analytics

Syllabus – Fall 2023 – 1.5 Units
Mondays – 6:30 – 9:30 pm

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Office Hours: TBD

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Course Description

The healthcare industry is changing rapidly due to technological changes, regulatory changes, demographic shifts, and changes in consumer expectations. This course helps graduate students understand the basics of healthcare analytics, the challenges, the opportunities, and separate what is real and what is speculation and hype. This is a hands-on class where students will be analyzing real healthcare data and then presenting their actionable business strategy insights and recommendations. Students will be working on projects and other assignments both individually and in groups.

Learning Objectives

Upon successful completion of this course, students will be able to:

1. Explain how the basics of healthcare analysis contribute to research and development and improving clinical and health outcomes.
2. Explain how the basics of healthcare analysis are used to assess value vs. cost, financial performance, and perform risk analysis.
3. Describe the basics of the healthcare ecosystem including key constituents and shareholders, and their goals from the perspective of various disciplines.
4. Explain the current role of artificial intelligence in healthcare data analytics.
5. Research and analyze real healthcare data using a variety of software platforms and formulate business recommendations.

Required Materials

Burke, Jason. *Healthcare Analytics: Gaining the Insights to Transform Health Care*. Hoboken: John Wiley & Sons, 2013. We will use this book as a guideline for the course schedule.

Fombu, Emmanuel. *The Future of Healthcare: Humans and Machines Partnering for Better Outcomes*. Ithica: Athena, 2018.

Prerequisites and/or Recommended Preparation:

Students must be comfortable with analysis using regression, clustering, basic neural networks, and other basic AI/machine learning techniques.

The healthcare industry is both more nuanced and significantly more complicated than traditional industries that use data analysis extensively. Specifically factors that complicate the analysis and warrant having an industry-specific class include:

1. The healthcare industry is one of the fastest changing industries. The transition from a fee-for-service model to a value-based model requires a new generation of data analytics and business insights.
2. The human factor in healthcare is significantly different. While analyzing auto insurance payouts versus premiums and risk may be straightforward, developing ways to measure factors like patient compliance accurately is tricky, particularly with self-reported measures and subjective reporting. Luckily new innovations in wireless data gathering are significantly changing the field, and it is important for students to be aware of both the unique challenges in this field and the correspondent opportunities that can derive from those challenges.
3. For the field of medicine and the business of healthcare to advance and truly become more effective and efficient, there is a need for business professionals who are well-versed in the nuances of the healthcare industry.
4. Having industry-specific courses will give Marshall graduates seeking careers in the field of healthcare management a competitive advantage over others.

Data Analysis in the Class:

While students are free to use any software platforms that they are comfortable with, the following tools are recommended for data-analysis projects: R, Python, JMP, Excel. Methods used will include linear regression, multivariate regression, classification models and clustering.

This class is not about learning new data analytics skills – it is about applying those techniques and learning how to extract important business insights and actionable recommendations based on data analysis performed.

Course Notes:

Blackboard, Google Sheets, and Google Drive will be used for communicating course information and collecting assignments.

Grading Policies:

My grading is simple, fair, and mathematically calculated. Your final course grade will represent how you performed in the class relative to other students. Historically, the average grade for a graduate elective class at USC Marshall is about 3.5.

Teamwork Group Selection:

Groups for group projects will be self-selected and groups for in-class activities will be randomly selected.

ASSIGNMENTS AND GRADING DETAIL

<u>Assignments</u>	<u>Points</u>	<u>% of Grade</u>
Midterm Exam	100	20%
Final Exam	100	20%
Group Analytics Project	100	20%
Individual Analytics Project	100	20%
Reading	50	10%
Class participation	<u>50</u>	<u>10%</u>
TOTAL	500	100%

The assignments will assess your ability to formulate questions relevant to an organization, your knowledge of metrics, your proficiency with the software tools, your ability to analyze data, formulate business insights, and put it into context for decision-making.

Assignment overview:

- 1. Reading (pop quizzes, reading summaries):** It's important that students stay up to date with the reading topics. There will be in-class pop quizzes or written summaries to check your work.
- 2. Group Analytics Project:** the first data analysis project will be a four-person team project that consists of analyzing healthcare data, formulating insights, and making an action plan of your recommendations based on each of the KPIs. You will also be handing in a team evaluation form evaluating your peers and yourself: this will inform me regarding each student contribution. Please note that grades for individual student contributions to team projects are assigned by me, based on my observations of the team's working dynamics, my assessment of the team's project quality, and thoughtful consideration of the information provided through your peer evaluations.
- 3. Individual Analytics Project:** an individual project with a similar goal as the group Analytics Project: analyze healthcare data and create a list of actionable business recommendations based on your insights.
- 4. The Midterm and Final exams** will test students' level of preparedness and understanding of the topics covered in the first and second half of the course, respectively.
- 5. Class participation** plays an important role in this course as it creates a collaborative environment where everyone's learning experience is enhanced by the contribution of others' opinions. In-class activities (brainstorming/discussion on relevant topics and data analysis practice) will facilitate students' interaction and participation.

Grading Standards

A

The analysis is relevant, uses the correct data and is concise and complete. It identifies any assumptions that were used, data integrity issues, and issues that need to be further addressed (if any) before a manager can plan.

The analysis is targeted at a managerial audience, is clearly written, and is free of spelling and grammatical errors. It includes relevant charts and graphs with explanatory text. There are no 3D or other types of graphs in formats that obscure the trends or data points. It uses the correct colors, data labels, and font size, and has a plain white or otherwise unobtrusive background.

B

The analysis is relevant, uses the correct data, and is complete. It identifies assumptions that were used, data integrity issues, and issues that need to be further addressed (if any) before a manager can plan. The report and presentation have most, but not all, of the attributes of an "A" assignment.

C

The analysis is relevant and uses the correct data but isn't complete; it's a recitation of facts rather than an analysis. It can be used for decision-making if a manager can deduce some of the issues on

his/her own. The report and presentation have some of the attributes of an “A” assignment.

D

The analysis is relevant but doesn’t use the correct data and isn’t complete. It needs further work before it can be used for decision-making. The report and presentation have only a few of the attributes of an “A” assignment.

F

The analysis isn’t relevant, doesn’t use the correct data, and isn’t complete. The report and presentation don’t have any of the attributes of an “A” assignment.

Assignment Submission Policy:

Assignments must be turned in electronically via Blackboard by 11:59 PM on the day of class of the week specified in the course calendar. Any assignment turned in late, even if by only a few minutes, will receive a grade deduction for every day it is late (for example, if your work is a B+ grade, you will be given a B grade if you turn it in late by up to one day). If your Internet access breaks down on the due date, you must deliver a hard copy at the beginning of class on that day. If you are unable to attend class on that day, plan for it to be delivered to the classroom or to my box by the start of class. Late or not, however, you must complete all required assignments to pass this course.

Evaluation of Your Work:

I will do my best to make my expectations for the various assignments clear and to evaluate them as fairly and objectively as I can. If you feel that an error has occurred in the grading of any assignment, you may, within one week of the date the assignment is returned to you, write me a memo in which you request that I re-evaluate the assignment. Attach the original assignment to the memo and explain fully and carefully why you think the assignment should be re-graded. Be aware that the re-evaluation process can result in three types of grade adjustments: positive, none, or negative.

ADDITIONAL INFORMATION

Add/Drop Process

Please check <https://classes.usc.edu/> for the last day to add the class or withdraw without receiving a “W” (and receive a refund) as well as the last day to drop with a mark of a “W” (no refund). If you are absent 3 or more times prior to the last day to withdraw from a course with a grade of “W”, I may ask you to withdraw from the class by that date.

Retention of Graded Coursework

Final exams and all other graded work that affect the course grade will be retained for one year after the end of the course *if* the graded work has not been returned to the student (i.e., if I returned a graded paper to you, it is your responsibility to file it, not mine).

Technology Policy

Laptops are permitted during academic or professional sessions unless otherwise stated by the respective professor and/or staff. Laptop use must be limited to following PowerPoints and taking notes. Laptops may not be used for instant messaging, writing emails, watching videos, or surfing the web in ways that are unrelated to class discussion. Using laptops for non-academic activities may result in loss of in-class laptop privileges for the entire course.

Use of other personal communication devices, such as cell phones, is considered unprofessional and is not permitted during academic or professional sessions. ANY e-devices (cell phones, tablets, Apple watches, laptops) must be completely turned off during class time. Upon request, you must comply and put your device on the table in off mode and FACE DOWN. You might also be asked to deposit your devices in a designated area in the classroom.

Pursuant to the USC Student Handbook (www.usc.edu/scampus, Part B, 11.12), students may not record a university class without the express permission of the instructor and announcement to the class. In addition, students may not distribute or use notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than personal or class-related group study by individuals registered for the class. This restriction on unauthorized use applies to all information that is distributed or displayed for use in relation to the class.

USC Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or “recycle” work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the

semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

Emergency Preparedness/Course Continuity

In case of a declared emergency if travel to campus is not feasible, the *USC Emergency Information* web site (<http://emergency.usc.edu/>) will provide safety and other information, including electronic means by which instructors will conduct class using a combination of USC's Blackboard learning management system (blackboard.usc.edu), teleconferencing, and other technologies.

Legal Notices

By remaining enrolled in this course, you agree to adhere to the following intellectual property and confidentiality requirements.

Intellectual Property

You will be working with real projects and companies in this class. All their materials, including anything you contribute to them will be considered the companies' intellectual property and they will retain all rights for unrestricted use of all materials.

All student work that is not for specific company projects is considered to be in the public domain unless the student turns it in with a copyright notice on it. Under no conditions may students commercialize anything they have created in this class without prior written consent of the professor who has the right to withhold consent for any reason.

Occasionally classes may be filmed by the professor, clubs or other organizations. If you choose not to be filmed, please tell the professor at the beginning of that class session and you will be seated out of view of the camera. Choosing not to be filmed will have no impact on your grades in this class and is entirely optional.

COURSE CALENDAR/READINGS/CLASS SESSIONS (subject to change)

	Topics/ Daily Activities	Readings and Homework	Deliverables and Due Dates
Week 1	- Intro, class assignments - Expectations - Changes in healthcare: old model vs. new model- Convergence	Chapters 1-3	<i>In-class activities</i>
Week 2	- Health analytics basics - Big Data: hype vs. reality - Financial performance - Artificial intelligence in healthcare data analytics	Chapters 4-6 + Study for Midterm Exam	<i>In-class activities</i>
Week 3	- Midterm Exam - In-class work on Group Analytics Project	Study for midterm exam	<i>In-class activities</i>
Week 4	- Health outcomes analysis - Value and cost - Issues in behavioral health	Chapters 7-9	<i>In-class activities</i>
Week 5	- Consumer insights - Risk management - Quality/safety management	Chapters 10-12	<i>Group Analytics Project Due; In-class activities</i>
Week 6	- Research and development - Analytical value-based innovation - Exam Review	Chapters 13-14, Study for Final Exam	<i>In-class activities</i>
Week 7	- Final Exam - In-class work on Individual Analytics Project	<i>Study for final Exam</i>	<i>In-class activities</i>
Week 8	- Future of healthcare - Class discussion	<i>EF book</i>	<i>Individual Analytics Project Due; EF Book discussion; In-class activities</i>

OPEN EXPRESSION AND RESPECT FOR ALL

An important goal of the educational experience at USC Marshall is to be exposed to and discuss diverse, thought-provoking, and sometimes controversial ideas that challenge one's beliefs. In this course we will support the values articulated in the USC Marshall "[Open Expression Statement](https://www.marshall.usc.edu/open-expression-statement)" (<https://www.marshall.usc.edu/open-expression-statement>).

Appendix I

CLASS PARTICIPATION

Class participation is an extremely important part of the learning experience in this course as the richness of the learning experience will be largely dependent upon the degree of preparation by *all* students prior to each class session.

A course that incorporates the frequent use of case analyses to illustrate the practical application of concepts and practices requires the student to diligently and thoroughly prepare cases and actively offer the results of the analyses and conclusions derived as well as recommendations during each class session. My expectation and that of your classmates are that you are prepared for *all* classes and will actively participate in and meaningfully contribute to class discussions.

In-class participation is also a critical part of this course's learning experience. Cold calling may take place to encourage active participation and to gain multiple perspectives and points of view, thus lending itself to the richness of the learning experience. In-class participation grading will be based on students' demonstrated willingness to participate, and the quality of the comments expressed, rather than quantity. While some students are far more comfortable than others with class participation, *all* students should make an effort to contribute meaningfully.

Students will offer their opinions in group settings many times in their careers; thus, class participation serves to prepare students for this business experience.

The evaluating of in-class participation is based on the following:

- *Relevance* – Does the comment or question meaningfully bear on the subject at hand? Irrelevant or inappropriate comments can detract from the learning experience.
- *Responsiveness* – Does the comment or question connect to what someone else has said?
- *Analysis* – Is the reasoning employed consistent and logical? Has data from course materials, personal experience, or general knowledge been employed to support the assertions/findings?
- *Value* – Does the contribution further the understanding of the issues at hand?
- *Clarity* – Is the comment concise and understandable?

During class sessions, I frequently assume the role of a facilitator to encourage a discussion that includes perspectives from a variety of viewpoints and, secondly, to help pull together prevailing analyses and recommendations. The direction and quality of a discussion is the *collective responsibility of the class*.

For each in-class session two (2) points will be awarded to a student for relevant and meaningful participation, one (1) point for modest contributions to the class and zero (0) points for no participation or absence.

To underscore the importance of participation, 10 percent of the course grade or 50 of 500 points are allocated to class participation.

Class Participation—Behavioral Anchor Rating Scale:

Excellent Performance

- Initiates information relative to topics discussed
- Accurately exhibits knowledge of assignment content
- Clarifies points that others may not understand
- Shares personal experiences or opinions related to topic
- Offers relevant / succinct input to class
- Actively participates in class exercises
- Demonstrates ability to apply, analyze, evaluate & synthesize course material.
- Demonstrates willingness to attempt to answer unpopular questions
- Builds on other students' contributions

Average Performance

- Participates in group discussions when asked
- Demonstrates knowledge of course material
- Offers clear, concise, “good” information on class assignments
- Offers input, but tends to reiterate the intuitive
- Attends class regularly

Unacceptable Performance

- Fails to participate even when directly asked
- Gives no input to discussions
- Does not demonstrate knowledge of the readings
- Shows up to class: does nothing
- Distracts group / class
- Irrelevant discussion

Appendix II.

MARSHALL GRADUATE PROGRAMS LEARNING GOALS

How DSO 599 Contributes to Marshall Graduate Program Learning Goals

Marshall Graduate Program Learning Goals	DSO 599 Objectives that support this goal	Assessment Method*
<i>Learning Goal #1: Develop Personal Strengths.</i> Our graduates will develop a global and entrepreneurial mindset, lead with integrity, purpose and ethical perspective, and draw value from diversity and inclusion.		
1.1 Possess personal integrity and a commitment to an organization’s purpose and core values.	Students may briefly discuss cultural factors, but this class probably won’t have time to explore healthcare systems of other countries.	In-class activities
1.2 Expand awareness with a global and entrepreneurial mindset, drawing value from diversity and inclusion.	Students will through their group projects and class discussions demonstrate various emotional intelligences and leadership skills such as self-awareness, self-management, teamwork and collaboration to better understand the potential complexities in organizations and the value of diversity and inclusion.	Group Project and class activities
1.3 Exhibit awareness of ethical dimensions and professional standards in decision making.	Ethical challenges and appropriate courses of action will be discussed in the class.	In-class activities
<i>Learning Goal #2: Gain Knowledge and Skills.</i> Our graduates will develop a deep understanding of the key functions of business enterprises and will be able to identify and take advantage of opportunities in a complex, uncertain and dynamic business environment using critical and analytical thinking skills.		
2.1 Gain knowledge of the key functions of business enterprises.	Students will understand the basics of the healthcare ecosystem including key constituents and shareholders, their aligned and misaligned goals in the U.S.	Midterm and Final Exam, in-class activities
2.2 Acquire advanced skills to understand and analyze significant business opportunities, which can be complex, uncertain and dynamic.	Students will be analyzing real healthcare data in order to understand and solve real business problems.	Individual and group projects

<p>2.3 Use critical and analytical thinking to identify viable options that can create short-term and long-term value for organizations and their stakeholders.</p>	<p>Students will demonstrate various emotional intelligences and leadership skills such as self-awareness, self-management, teamwork and collaboration to better understand the potential complexities in organizations.</p>	<p>Individual and group projects, in-class activities</p>
<p><i>Learning Goal #3: Motivate and Build High Performing Teams.</i> Our graduates will achieve results by fostering collaboration, communication and adaptability on individual, team, and organization levels.</p>		
<p>3.1 Motivate and work with colleagues, partners, and other stakeholders to achieve organizational purposes.</p>	<p>Students will learn about the roles, responsibilities and behaviors of world class managers and leaders in diverse business roles as related to identifying, analyzing, and solving healthcare business problems.</p>	<p>Individual and group projects, in-class activities</p>
<p>3.2 Help build and sustain high-performing teams by infusing teams with a variety of perspectives, talents, and skills and aligning individual success with team success and with overall organizational success.</p>	<p>Students will demonstrate various emotional intelligences and leadership skills such as self-awareness, self-management, teamwork and collaboration to better understand the potential complexities in organizations.</p>	<p>Individual and group projects, in-class activities</p>
<p>3.3 Foster collaboration, communication and adaptability in helping organizations excel in a changing business landscape.</p>	<p>Students will have one group project as well as in-class interaction on how to more effectively work together.</p>	<p>Group projects, in-class activities</p>

Appendix III

Peer Input Forms

Grades for individual student contributions to team projects are assigned by me, based on my observations of the team's working dynamics, my assessment of the team's project quality, and thoughtful consideration of the information provided through your peer evaluations.

Please identify your team and team members for the Group Project that you worked on. Then rate all your team members, *including yourself*, based on the **contributions** of each team member for the selected assignment according to the criteria listed below. On a scale of 0 – 2 with 0 indicating does not meet expectations, 1 meets expectations and 2 exceeds expectations, rate each person on each of the five criteria. Lastly, add up the points for each person with the maximum number of points for each person being 10. In the box below, describe the exact contributions of each team member, including yourself.

Team Members/ Assessment Criteria of Team Contributions	Team Member 1	Team Member 2	Team Member 3	Yourself
1. Role Performance				
2. Assists Team Members				
3. Listening and Discussing				
4. Research and Information Sharing				
5. Time Management				
Total				

Contribution details: