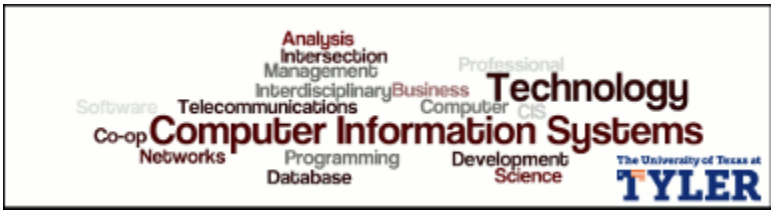


Sports Data Analytics

COSC 4342 / CSCI 5342

Fall – 2022

Course Description

Prerequisites: MATH 1342 and MATH 1343, or other statistics course. Identifying the metrics, types of analyses and making sense of sports-related data from a managerial business perspective. Use of industry tools to gather, learn, make predictions and visualize large sports data sets.

Class Time

Tuesdays and Thursdays 11:00am – 12:20pm
COB 255

Instructor Information

Dr. Robert P. Schumaker
Professor, Computer Science Dept.
rschumaker@uttyler.edu

Office Hours

DM through Slack (preferred), Zoom, email
If your inquiry is grade-related, please make a Zoom or physical appointment.
No appointment needed for Tuesdays and Thursdays 9:30am – 11:00am in COB 315.05

Textbook Information

Required

Analytic Methods in Sports – Severini, 2020 ISBN: 978-0367469382

Course Objective

This course is designed with the following goals:

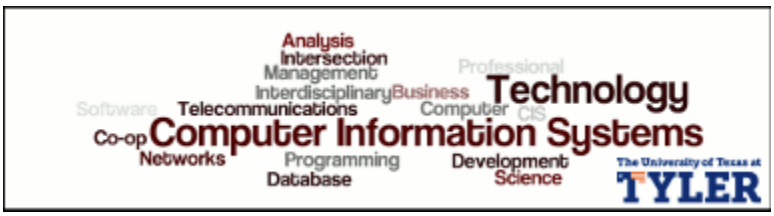
- Identify a broad range of methods used in sports data acquisition, representation, analysis and reporting
- Demonstrate an understanding of statistics and their application to sport
- Develop the ability to recognize, formulate and analyze decision-making in sport
- Improve overall problem solving/analysis skills and critical thinking
- Conduct sports data acquisition, representation and prediction activities
- Assess current sports analytics trends and how they can apply to new areas

Computer Account Access

Students will need a Patriot account and password for computer access. This information can be found at http://www.uttyler.edu/ccs

Course Documents and Slides

This class will use Canvas for course documents, slides and other class-related materials. Students are encouraged to check the website frequently during the course of the semester to keep up to date about class changes.



Sports Data Analytics

COSC 4342 / CSCI 5342

Fall – 2022

Course Grading

Course evaluation will be based on the following:

MLB Playoff Decision Analysis Report (Tentative)	20
Fantasy Football Decision Analysis Report (Tentative)	20
Topic Report (Undergraduates)	20 or
Sports Analytics Project (Graduates)	20
Case Discussion (5 cases @ 5 points)	25
Lifelong Learning	5
Class Participation	10
Total Points	100

Grading Scale

A	90.0 points or more
B	80.0 to 89.999 points
C	70.0 to 79.999 points
D	60.0 to 69.999 points
F	59.999 points or less

Course Policies

1. MLB Decision Analysis Report – Students will use their analytics skill to determine the winners of each round of MLB playoffs. Students will make predictions of winning teams using quantitative evidence from multiple analytic techniques and defend their choices. The report will be evaluated based on backtesting on the prior year's playoffs (5 points), spelling/grammar (5 points) and correctly picking matchups (10 points, +1 for every correct pick) with a possibility of 5 bonus points. More details will be given during the semester. Students that correctly pick their entire bracket will also be immortalized in this syllabus forever.

Your name here
(2021)

Favorite quote that won't land either of us in the Dean's Office

2019 – One person was 2 picks away from immortalization, but failed.
2020 – The entire class picked the Twins and lost in the first round. 😬
2021 – No one made it past the Division Series

2. Fantasy Football Decision Analysis Report – Students will put their analytics skill to the test by competing against each other in a fantasy football league. Students will keep a diary of every decision made in managing their team. The report will be evaluated based on depth of their pre-draft strategy (5 points), each week's lineup selection rationale (5 points, +1 for each week), spelling/grammar (5 points) and winning (5 points, +1 for every win), with a possibility of bonus points based upon their end of season ranking. More details will be given during the semester.

3. Topic Report (Undergraduates) – Each student will produce a report on a current, state-of-the-art topic in sports analytics. Topics can be obtained from a news article, webpage, blog, or other source. This is an opportunity for the students to learn more about a cutting edge technology. Students must have approval from the instructor fourteen days in advance (5 points) and will be further evaluated on depth of research (5 points), spelling/grammar (5 points) and references (5 points, +1 each).

4. Sports Analytics Project (Graduates) – Graduate students will work in groups to produce a sports analytics project. Students will work with the Instructor to identify a project, determine overall project goals, expected individual contributions and a project grading rubric. This project will be software/programming related and commensurate in difficulty to graduate student education. Undergraduate students **may** elect the sports analytics project in lieu of a topic report.

5. Case Discussion – Throughout the semester we will analyze business technology cases through Canvas. Students will post their discussion questions and answer others. More details will be provided in Canvas.

6. Lifelong Learning – It is imperative for successful individuals to continue learning throughout their lifetime. Professional organizations are a wonderful opportunity to reinvent, retool and build connections with industry leaders. Students that attend a professional technology organization meeting (and email proof of attendance) will receive credit. Upcoming meetings and events can be found on Canvas. Online webinars will be accepted.

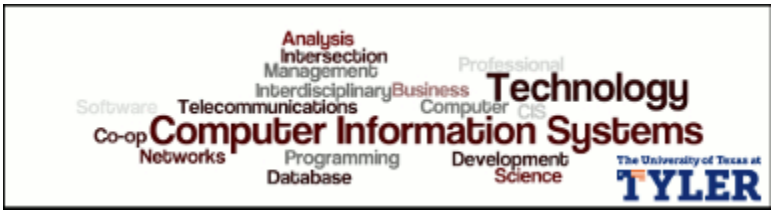
7. Class Participation – Class Participation points will be scored by the quantity of quality discussion a student contributes regarding relevant technology-related articles. The maximum points that can be earned is ten.

8. Missed Work: Business professionals must also take responsibility for attending all scheduled meetings and activities. Attendance is absolutely necessary in order to be successful in this class**.** We will cover a new topic each class period and each subsequent class will build upon prior skills and concepts. If you miss a class you will miss an entire topic and any materials and assignments passed out. **Students who miss class are responsible for getting missed materials and lecture information on their <u>own time</u> from their peers**.

9. Time Outside of Class: This course is a computer application course that requires students to complete computer application exercises and projects**.** It is the responsibility of the student to make a **backup** of all assignments or application projects. *If your work is not saved and accessible by the instructor, then it cannot be evaluated and a grade of F will be given for that particular project or assignment.* BACKUPS of projects and tests are imperative in order to avoid lost or damaged data.

10. Meow. If you send the Instructor a DM through Slack of a lolcat before Sept 3 at 5pm, you will receive a bonus point. Keep this to yourself and do not share it with classmates.

11. Classroom Lab Rules
    - Please do not surf the Web during class unless instructed to access the Internet.
    - Do not access inappropriate Web sites during class. This will lead to dismissal from the class.
    - Please do not work on other computer assignments during class.
    - Please do not talk to your neighbor during class.
    - Please do not bring food or an uncovered drink into the computer classroom lab.
    - Please do not order food to be delivered to the classroom.
    - Do not use your phone during class.



Sports Data Analytics

COSC 4342 / CSCI 5342

Fall – 2022

Tentative Course Schedule and Assignments:

Scheduled dates may vary depending on the pace of the class.

Date	Concept	Readings	Assignments
Aug 23	Introduction and Analytics in the AFL		
Aug 25	Introduction to RStudio		
Aug 30	Introduction to Baseball		
Sep 1	Baseball – A Brief History of Baseball Statistics		
Sep 6	Baseball – Batting Statistics		
Sep 8	Baseball – Pitching Statistics		
Sep 13	Baseball – Fielding Statistics		
Sep 15	Baseball – Park Statistics		
Sep 20	Baseball – Valuing Players		
Sep 22	Baseball – Decision Making		
Sep 27	Introduction to Football		
Sep 29	Football – Metrics, State & Value Analysis and Decision Making		MLB Postseason Predictions
Oct 4	Football – Passing, Rushing and Conversions		
Oct 6	Football – EPA, Advanced Analytics and Visualization	AM Ch 7	
Oct 11	Football – Stat This!		
Oct 13	Introduction to Fantasy Football		
Oct 18	Fantasy Football Draft		FF Pre-draft and Draft
Oct 20	Introduction to Basketball		FF Week 1 lineup
Oct 25	Basketball – Metrics, Linear Weights and +/- Ratings		
Oct 27			FF Week 2 lineup
Nov 1			
Nov 3			FF Week 3 lineup
Nov 8			
Nov 10			FF Week 4 lineup
Nov 15			
Nov 17			FF Week 5 lineup
Nov 22	No Classes – Thanksgiving		
Nov 24	No Classes – Thanksgiving		FF Week 6 lineup
Nov 29			
Dec 1			

MLB Decision Analysis Report due before the first pitch of the playoffs.
NFL Decision Analysis report due 5pm, one week after the last game played.