Program	Expert
……..	Ravi Ramineni

Syllabus

Proposed name: Introduction to Data Science and its Applications in TeamSport

Justification

An introductory Data Science in team sports course serves as a crucial foundation for students looking to understand the growing role of analytics in sports. This certificate bridges the gap between traditional sports knowledge and the data-driven approach that is revolutionizing the industry. It introduces students to the basic concepts of data science and statistics, specifically tailored to sports applications, allowing them to grasp how numbers can translate into actionable insights on the field.

This certificate covers fundamental statistical concepts such as descriptive statistics, probability, and basic inferential statistics, all contextualized within sports scenarios. Students learn about how sports data is collected, data cleaning, and analysis of sports-related data using entry-level tools and software like Excel and Tableau. Students will also be introduced to the programming language Python to do more advanced analyses.
This introductory certificate lays the groundwork for more advanced studies in sports analytics while also providing valuable skills for students pursuing various careers in team sports and the sports industry. It caters to a wide audience, from current and aspiring coaches and support staff working inside the teams to future data analysts who aspire to work inside sports teams. By the end of the program, students will have a solid understanding of how data is collected, analysed, and utilised in team sports, preparing them for a future where data literacy is increasingly important in all aspects of sports. This certificate will help facilitate the transfer of technical and physical information from the matches and training to assist the coaches and decision-makers in making informed decisions.

Syllabus objectives:

- General objective: Introduce data science and how it is applied to sport. Specific objectives:
    - Specific objective 1: Introduce and explain data science, the mathematics and statistics that form the foundation for data science
    - Specific objective 2: Data collection, cleaning and analysis
    - Specific objective 3: Different techniques and methods used in data analysis
    - Specific objective 4: Introduce the different technologies and software commonly used in data analysis

Graduate profile:

At the completion of this certificate, the graduate will have a good understanding of the fundamentals of data science. They will be able to identify types of data and how to use different streams of data. They will be able to perform exploratory data analysis and use the different software tools like Excel, Tableau and Python. Finally, graduates will be able to do some detailed and advanced data analysis in python and will be introduced to the basics of how to communicate findings from data analysis.

Aim to:

This certificate assumes no prior knowledge or experience in working with data. It caters to a wide audience, from current and aspiring coaches and support staff working inside the sport to future data analysts and sports journalists

Students of this course ideally have a basic college degree or have exposure to high school mathematics. Exposure to sports data and some basic level experience working with sports data is a plus.

Courses proposed for the development of the program:

- Course 1: Fundamentals of Data Science
- Course 2: Data collection, cleaning and analysis in sport
- Course 3: Data Analysis Basics
- Course 4: Advanced Data Analysis

ANNEX 1

Certificate / Diploma Program (complete annex 1 for the whole Certificate / Diploma)

1. Course 1: Fundamentals of Data Science

    1.1 Module 1: What is Data Science? – Definitions and basics
    1.2 Module 2: Data science career opportunities in sport
    1.3 Module 3: Statistics and the Math Behind Data Science
    1.4 Module 4: Application of data science in sport

2. Course 2: Data types, data collection and data cleaning in sports

    2.1 Module 1: Sports Data Types
    2.2 Module 2: Data collection in sports
    2.3 Module 3: Data Cleaning and Preparation
    2.4 Module 4: Data Storage and Combining Data Sources

3. Course 3: Principles of Data Analysis

    3.1 Module 1: Data Analysis Process
    3.2 Module 2: Data Analysis - Tools and Technologies
    3.3 Module 3: Data visualization
    3.4 Module 4: Data analysis techniques

4. Course 4: Advanced Data Analysis – Introduction to machine learning

    4.1 Module 1: Advanced data analysis techniques
    4.2 Module 2: Advanced data analysis examples
    4.3 Module 3: Communication and presentation of the analysis
    4.4 Module 4: Case study and course summary