# QUANTITATIVE METHODS IN SPORTS (S): FALL 2024

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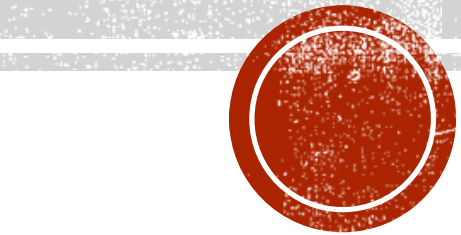


University of Zurich[UZH]

- **Language:**
  - English

- **Schedule:**
  - Friday, 20.09.2024, 09:00 – 12:30
    - Overview of the seminar & logistics
    - Two guest speakers: Prof. Jan van Ours  and Prof. Mario Guajardo
    - Overview of other potential topics for the student reports & presentations
  - Friday, 08.11.2024, 09:00 – 17:00
    - Student presentations
  - Friday, 15.11.2024, 09:00 – 17:00
    - Student presentations

- **Lecture room:**
  - TBD

- UZH Course Catalogue

- **Course Objectives:**
  - The seminar will review the mainstream literature on applications of quantitative methods in various sports related contexts
  - We will discuss multiple thought-provoking application examples ranging from classical scheduling problems in different sport leagues to modern "fantasy" sports
  - The seminar participants will become familiar with challenges and opportunities arising when applying quantitative methods to modern sports
- **Structure:**
  - We have scheduled two guest speakers for the first seminar on September 20
  - Two additional sessions are for the students' presentations
  - The class relies on the active participation of the students
- **Grading:**
  - Class Participation (20%) + Presentations (40%) + Final Report (40%)

## Session 1 (Friday, September 20,2024):

- Introduction into the seminar & logistics
- Two guest speakers:
  - "On economics in sports," Prof. Jan van Ours
  - "Applying mathematical programming to schedule sports tournaments", Prof. Mario Guajardo
- Quick overview of potential topics for students

## Later:

- Form groups (if needed)
- September 27: topic proposal is due (see slide 7 for details)
- October 4: all proposals should be approved
- November 1: 1st draft of the report is due (see slide 8 for details)
- **November 8 (Session 2)** and **November 15 (Session 3)**: student presentations
- November 22: feedback for the reports is provided
- December 16: final report is due (see slide 8 for details)

- "On economics in sports," Prof. Jan van Ours (Erasmus School of Economics, Erasmus University Rotterdam)
  - **Abstract:** Behavior of individuals and the consequences of that behavior are studied by economists but also by sociologists and psychologists. What makes economists different is that they are obsessed by causality: what is affecting what? The idea is that once they know the nature of causal relationships they can come up with policy recommendations to improve consequences of behavior. Establishing causality in relationships is non-trivial as these are often complicated. Studying sports can be helpful with this since sports provide a laboratory environment to study human behavior in a real-life setting. The seminar will present and discuss five topics to illustrate the economics in sports, i.e. how studying sports can be helpful in understanding economic relationships. The topics are the following: Do managers matter for firm performance (football)? Does implicit racial discrimination by sports journalists occur (football)? How do individual workers affect team productivity (hockey)? How do high temperatures affect labor productivity of individual workers (tennis)? Do better workers match with better firms (running)?

- "Applying mathematical programming to schedule sports tournaments", Prof. Mario Guajardo (NHH Norwegian School of Economics)
  - **Abstract:** A main problem in the organization of sports leagues is to define a schedule of games. This involves decisions on when and where the teams should meet to play against each other. The problem is challenging because many conditions must be taken into account on behalf of different stakeholders, such as league officials, players, television broadcasters, and football fans. Some examples of these conditions include stadium availability, travel distances, home and away sequences on consecutive games, fairness, and tournament attractiveness. The progress of optimization methods and computational resources have made possible to address this problem in a more efficient way than simple manual or random approaches. This seminar will give an overview on sports scheduling, referring to the different criteria considered in the literature and illustrating with real-world cases how the application of mathematical programming models has helped decision makers to schedule football leagues.

- **Short-term expectations (for September 20):**
  - Follow the talks to obtain a feeling for SpORts
  - Participate actively: ask questions, give feedback! (Quality, not only quantity is important.) Individually, you obtain one participation grade for each day we meet. Your participation grade will be the average of all participation grades. (20%)
- **Mid-term expectations (after September 20):**
  - Pick your topic based on:
    - the ideas discussed during Session 1
    - additional references (provided by the instructors), or your interests
  - Identify and read related literature
  - Pick one or two research papers (P) that will form the basis for your presentation and report:
    - it should not be a survey paper
    - the papers should be published after 2000
  - By September 27: send an email to Prof. Oleg Prokopyev including
    - the proposed topic (the title and a short abstract, 1-2 paragraphs long)
    - the papers
    - names of all group members

    You may also schedule a meeting with instructors before September 27$^{th}$ to discuss options.
  - By October 4: all proposals (and the respective papers) should be approved. If multiple groups pick the same topic, approval is on a first-come first-served basis.

- **Long-term expectations (after October 4th):**
  - Understand the paper(s) (P) that you picked in detail
  - Write a seminar thesis of 10-15 pages including:
    - A literature review and a detailed discussion of the model in (P)
    - Potential future opportunities for application of quantitative methods in the considered sport setting
    - Discussion of potential implementation challenges and desired outcomes
  - Submit this "first draft" of your seminar thesis via Olat by November 1st
  - Present your topic, in particular managerial issues, in a 45-minute class presentation (40% of the grade):
    - Give some background and explain the model presented in (P) in detail
    - Identify potential future opportunities for application of quantitative methods in the considered sport setting
    - Discuss potential implementation challenges and desired outcomes
  - Use the feedback that is provided to improve your "first draft" and submit the final report by December 16th (40% of your grade)