Emerging Topics in Operations Management: Data Analytics and OM-Finance Interface

Course instructor

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Application procedure

Goal and target audience

This graduate-level seminar is designed to provide doctoral candidates with a comprehensive understanding of two emerging research areas in the field of operations management: (i) business analytics and data-driven research and (ii) interface of operations management and finance (fintech). I will begin by conducting a systematic review of the existing literature in these areas, with an emphasis on key theories, concepts, and findings. I will then explore the latest research developments and examine their practical applications in various industries. Participants will also have the opportunity to develop and present their own research projects related to these topics.

This course is open to all interested doctoral candidates from all management disciplines. Candidates can be on any stage of their doctorate.

Application process

There is a limit of 15 participants maximum for this course. Please use the official application procedure for the TUM SoM Doctoral Summer School.

The application starts on May 2, 2023, 12:00 noon. The deadline for application is June 30, 2023, end of day. Registration works on a first come, first served basis. Registration is only possible for doctoral candidates of TUM School of Management.

Please find the link for registration here: https://www.mgt.tum.de/faculty-research/doctoral-program/course-program

Course aims

What this course is

This course serves as an introduction to two emerging topics in operations management: business analytics and the OM-Finance interface (fintech). In addition to covering key theories, the course will involve a significant amount of time spent reading and discussing papers, as well as generating and executing new ideas for publication. As a hands-on course, active

participation in class discussions is expected from all participants.

Course objectives

Knowledge Objectives

The knowledge objective of this graduate-level seminar is to provide students with a thorough understanding of emerging research areas in operations management, namely business analytics and OM-Finance interface, and equip them with the skills to develop their own research projects and target high-impact publications. Doctoral candidates will learn to conduct a systematic review of literature, explore the latest research developments and examine their practical applications, and develop a research perspective suitable for targeting high quality journals.

Skills Objectives

- Doctoral candidates will be able to conduct a systematic review of literature related to emerging research areas in operations management, namely business analytics and OM-Finance interface.
- Doctoral candidates will be able to develop and execute research projects related to business analytics and fintech, including identifying a general research problem, stylizing the problem for modeling purposes, selecting appropriate methodologies, and effectively presenting the results.
- Doctoral candidates will be able to communicate research findings and recommendations effectively to different audiences, including academics, practitioners, and policymakers.

Learning Objectives

The course aims to help doctoral candidates achieve the following learning objectives: (1) understand the fundamental concepts and theories in business analytics and OM-Finance interface, (2) acquire the necessary skills for conducting rigorous research in these areas, and (3) develop a research perspective that can lead to high-impact publications. By the end of the course, participants should be able to critically analyze relevant literature, design and execute research projects, and communicate research findings effectively.

Preliminary schedule

The course takes place in the second week of the **TUM School of Management Doctoral Summer School** from September 25 to September 29, 2023. We will meet in person each morning/noon. Students will review key concepts in the afternoon sessions, read and discuss papers and new ideas, and prepare for the next day's session.

Day 1 and 2: An Introduction to Business Analytics Research in Operations Management
- Prediction models using ML techniques
- Empirical models using big data
- Integrating prediction models with operating decisions: a data-driven decision making approach

Day 3: Operations Management and Finance Interface – an Introduction
- Fundamentals of OM-Finance Interface

- Supply Chain Finance Technologies, Fintech
- Block-chain driven operations and finance

Day 4: Operations Management and Finance Interface – Energy Operations Management

- Organization and functioning of electricity markets
- Integrated financial and operational risk management in energy markets
- Research opportunities in energy markets

Day 5: Final presentations

Please refer to the schedule for the Summer School for further details on the course schedule. The schedule for the Summer School can be found in the digital flyer on the Summer School: https://www.mgt.tum.de/faculty-research/doctoral-program/course-program

Core readings

- Feldman, J., Zhang, D. J., Liu, X., & Zhang, N. (2022). Customer choice models vs. machine learning: Finding optimal product displays on Alibaba. Operations Research, 70(1), 309-328.
- Cui, H., Rajagopalan, S., & Ward, A. R. (2020). Predicting product return volume using machine learning methods. European Journal of Operational Research, 281(3), 612-627.
- Griffis, S. E., Rao, S., Goldsby, T. J., & Niranjan, T. T. (2012). The customer consequences of returns in online retailing: An empirical analysis. Journal of Operations Management, 30(4), 282-294
- Chod, J., Trichakis, N., Tsoukalas, G., Aspegren, H., & Weber, M. (2020). On the financing benefits of supply chain transparency and blockchain adoption. Management science, 66(10), 4378-4396.
- Reindorp, M., Tanrisever, F., & Lange, A. (2018). Purchase order financing: Credit, commitment, and supply chain consequences. Operations Research, 66(5), 1287-1303.
- Kouvelis, P., Dong, L., & Turcic, D. (2020). Advances in supply chain finance and FinTech innovations overview. Foundations and Trends® in Technology, Information and Operations Management, 14(1–2), 1-4.
- Goel, A., & Tanrisever, F. (2017). Financial hedging and optimal procurement policies under correlated price and demand. Production and Operations Management, 26(10), 1924-1945.

I will announce and share additional literature during the course.

Course procedures

No prior preparation is necessary for the course. Attendance and active participation in every session are mandatory, with sessions typically held in the morning/early afternoon and group work expected in the afternoons.

Assessment

On the final day of the course, participants will need to present a preliminary research proposal/idea as a group. The size of the groups will depend on the number of participants, and

evaluation will be based on pass or fail criteria rather than detailed grading.

Workload
3 ECTS