School of Management and Law

Moduledescription	Summer/Winter School in Data Science	w.MA.WI.SUMMERSCHOOL

Abstract to the Data Science Summer/Winter School 2023-2027

Our Summer/Winter Schools last 1 - 6 weeks and take place during the lecture free period at different partner universities in France, India and the United States of America. Each session covers one field of practice in Data Science. Through company visits and on-site practicums, students gain insight and experience around the innovative applications of data science in fields including health analytics, smart cities, financial services, and the supply chain. Depending on the period of exams at the ZHAW, the schools take place in week 5/6/7 or 6/7/8 (Winter School) and summer 26/27 or 27/28 (Summer School). The schools are designed both to develop a practical knowledge and skills in the field of Data Science and to help the participants understand the context of working internationally and are thus ideal complements to the modules offered on campus. The curriculum of each session is unique so that it is possible to combine two schools during the master study program. Each session requires a minimum number of twenty participants.

Next schools:

- FS 2023: Summer School, July 2023
  Place: Bayonne, Biarritz (France)
  Partner: L'Université de Pau et des Pays de l'Adour (UPPA)
  https://organisation.univ-pau.fr/fr/index.html
  Minimum number of participants: 20

- HS 2023: Winter School, February 2024
  Place: Prague (Czech Republic)
  Partner: Vysoká škola ekonomická v Praze, Prague University of Economics and Business
  https://www.vse.cz/
  Minimum number of participants: 20

- FS 2024: Summer School, July 2024, Place: Bayonne, partner as above, confirmed

- HS 2024: Winter School, February 2025, Place: Bangkok (Thailand) - not confirmed yet

- FS 2025: Summer School, July 2025, Place: Bayonne, partner as above, confirmed

- HS 2025: Winter School, February 2026, Place: Hawaii (USA) - not confirmed yet

- FS 2026: Summer School, July 2026, Place: Bayonne, partner as above, confirmed

- HS 2026: Winter School, February 2027, Place: Mysore (India) - not confirmed yet

Curricula development partner: The Business Analytics Institute, Bayonne (France), https://www.baieurope.com

Item	Description
Module Code	w.MA.WI.SUMMERSCHOOL

Item	Description
Session on the Essence of Data Science. Summer School, July 2023, 2024	On the campus of the Université de Pau et des Pays de l'Adour (UPPA) in Bayonne/Biarritz (France), we will learn how to process structured and unstructured data using modern analytics tools. You will also learn how to apply machine learning and blockchain technology to help develop Fintech businesses. In a workshop participants will work through an integrative case study using Microsoft Machine Learning Studio and H20 Flow to analyze and apply real-life data to address the managerial issues facing a traditional European retail bank. In small groups, participants will identify and address the organization's data science practices using the content, methodologies, and knowledge presented in the summer session. The participants will be asked to work collaboratively, producing an executive vision and presentation focusing on the vision and implementation strategy for the institution. This case study provides the opportunity to assimilate the lessons learned from each of the session's modules in dealing with the practicalities of retail banking in Europe. Participants will be asked to analyze the regulatory environment, as well the evolution of consumer demands, to identify potential scenarios for new service offers. They will then qualify the data at hand, paying particular attention to the issues of cleansing, transforming, and consolidating the data for use in machine learning. Each group will then ideate scenarios for improving the bank's service offer, as well as identify the methods and algorithms that can be used to operationalize this vision. Finally, the participants will debate and discuss the technical, organizational, and ethical considerations needed to transform their vision into reality. During the case, participants will apply business insights, data engineering and data science techniques to explore one or several of the following subcases: • Segment delinquent borrowers, identify self-cure customers, and propose collection strategies to improve on-time payment rates • Explore customer purchasing patterns, categorize customer profiles, and propose customer service strategies • Analyze customer behavior to determine which set of new financial services can be recommended, target primed customers for upselling, and propose virtual agents to promote hyper-personalization. • Detect patterns of interest (outliers, exceptions, peculiarities, etc.) that deviate from expected behavior, identify contextual or collective anomalies that point to fraudulent activity, and propose a model for automating fraud detection. • The ethical challenges and opportunities in developing artificial intelligence in key banking processes • The ethical considerations developing human potential, dealing the consequences of implicit bias, and encouraging the evolution of managerial responsibility in the industry. • Given a digital banking practice, describe the ethical challenges, build an operational framework, and formulate recommendations to address these concerns Further participants will gather and practice following skills: • Understand the basic concepts and value chains in Data Science • Get familiar with the most common tools and frameworks in Data Science • Learn to process and exploit structured and unstructured data • Learn to define, train and validate first machine learning models • Learn to understand how blockchain technology works and develop a minimal chain

Item	Description
Program and Specialization	Business Information Technology
Legal Framework	Academic Regulations MSc in Business Information Technology dated 14.06.2012, Appendix to the Academic Regulations for the degree program in Business Information Technology, first adopted on 10.07.2012
Module Category	**Module Type:** Elective module
ECTS	receiving 4, accredited 3
Organizational Unit	W Abteilung Institut für Wirtschaftsinformatik
Module Coordinator	Christian Hitz
Deputy Module Coordinator	Mike Krey
Prerequisite Knowledge	-
Contribution to Program Learning Goals (Affected by Module)	- Professional Competence - Methodological Competence - Social Competence - Self-Competence

Item	Description
Contribution to Program Learning Objectives	Professional Competence • Knowing and Understanding Content of Theoretical and Practical Relevance • Apply, Analyze, and Synthesize Content of Theoretical and Practical Relevance • Evaluate Content of Theoretical and Practical Relevance Methodological Competence • Problem-Solving & Critical Thinking • Scientific Methodology • Work Methods, Techniques, and Procedures • Information Literacy • Creativity & Innovation Social Competence • Written Communication • Oral Communication • Teamwork & Conflict Management • Intercultural Insight & Ability to Change Perspective Self-Competence • Self-Management & Self-Reflection • Ethical & Social Responsibility • Learning & Change

Item	Description
Module Learning Objectives	Students... • are familiar with the important technical terms related to information systems and information technologies used in business intelligence and performance management. • explain the interrelationships between various technical terms. • analyze specific business issues based on the knowledge structure taught. • apply business intelligence tools and methods in short practical exercises. • develop concrete solutions to business issues. • evaluate solutions for specific issues on the basis of the criteria taught. • weigh up the advantages and disadvantages of business intelligence and performance management systems in the creation of competitive advantage. • demonstrate the knowledge they have acquired in presentations and discussions. • work in groups to achieve a shared goal. • develop a willingness to engage more deeply with selected business intelligence and performance management approaches in an operational context. • appreciate different points of view in the evaluation of solution strategies and problem areas.

Item	Description
Module Content	The content depends on the various sessions (see above) but in general and in addition, students understand • Application of information systems at various management levels of a corporation • Defining the scope of transactional and analytical information systems • Architecture and components of business intelligence and corporate performance management systems • Information processes and forms of organization of operational reporting • Reporting, budgeting, and forecasting using integrated enterprise systems • Processes of data collection, data reduction, and data analysis • Basic methods of data mining, data analysis, and information provision • Practical handling of IT-based systems to assist decision-making • Innovations in the field of business intelligence • Maturity level models of business intelligence solutions • Business intelligence and data governance • Enhancements to internal reporting of external data and information flows (Web 2.0, Web 3.0, big data, Industry 4.0) • Abolition of the separation of transactional and analytical information systems • Process mining methodologies and tools
Methods of Instruction	 • Lecture • Interactive Instruction • Case Studies • Exercises • Problem-Oriented Teaching • Discussion • Presentation • Group work

References

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Version History

Version	Date	Changes
0.1	29.9.2020	Initial Draft Version
0.2	30.9.2020	Update References
0.3	1.10.2020	Final Review Version
0.4	1.10.2020	Published Version
0.5	14.07.2022	Revised Version
0.6	07.09.2022	Revised Version
0.7	12.04.2023	Revised Version, added Prague, Bangkok, Hawaii

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