Course Descriptions None 2019-2020

Course Title	Advanced Data Systems for Smart Services
Course Code	EBC4224
ECTS Credits	4,0
Assessment	Whole/Half Grades

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
4	3-2-2020	3-4-2020					

Level	Advanced
Coordinator	Visara Urovi For more information:v.urovi@maastrichtuniversity.nl
Language of instruction	
Goals	After following this course, you will have gained the following competences: •Knowledge acquisition: Understand the main concepts of data-driven distributed applications; understand relational database model, parallel data processing models, no-sql databases, understand the notions behind distributed computing architectures and large scale systems such as mHealth and Blockchain. •Knowledge application and judgement: in case studies and an assignment, students will learn to use and extend their knowledge on the basis of realistic problem cases. •Critical Thinking: students will be given literature to read upfront. The material also includes academic papers in which the research methodology to measure the impact of decision-making in the context of smart services is discussed. •Communication and professional attitude: to realize the above learning objectives, interaction, feedback, and teamwork will be key. As a result, students will also sharpen their communication skills and improve their professional attitude.
Description	The last decade has seen a big development in databases, distributed systems, and in the ways we build applications and services on top of them. There are several reasons for these developments amongst which: Internet based companies handle large volumes of data, which has pushed them to create new tools to efficiently handle data at a scale; businesses need short development cycles and flexible data models to respond quickly to rapidly changing markets; free and open source software has become very successful and is now preferred to commercial software; thanks to available infrastructures it is easier to build distributed and scalable systems. The development of smart services is largely driven by these latest trends in information technology. The Advanced Data Systems for Smart Services focuses on system architectures and solutions where data is the primary challenge. The goal of this course is to help you understand the concepts behind the fast-changing landscape of technologies for processing and storing data. While technology evolves fast, there are enduring principles that remain true, no matter which version of a particular tool you are using. If you understand those principles, you're in a position to see where each tool fits in, how to make good use of it, and how to avoid its pitfalls. This is why, in this course your efforts will be into understanding well the principles behind data intensive systems, rather than applied skills into a specific technology. We will focus on cloud computing which is playing an important role in defining new advanced services with an ever-expanding reach to the masses, a significant reduction of costs and an abundant choice of applications available. Through Internet services, cloud computing enables easy use of software platforms and computing infrastructures from any location. Along with this phenomenon, we are now witnessing an explosion of information generated through social media, messaging, emails and more. Big Data provides us with new intelligence from massive data sets, which can greatly improve the decision-making process. The explosion of information is also facilitated by the proliferation of connected devices (i.e., sensors and smartphones); Internet of things has enabled interoperability between many devices to a scale were the devices can collect and exchange large amounts of data. Finally, in such a distributed setting, the Blockchain platform offers a new model for handling transactions of value, without relying on trusted authorities. The models behind these systems contribute to new ways we exchange and consume information and how we take decisions.
Literature	•The lecture slides, available in the course's webpage; •Designing Data Intensive Applications by Martin Keppmann . •The academic papers and readings are listed in the course manual and are made available electronically. Articles have generally been selected from leading professional and academic journals in the field of Distributed Systems.
Prerequisites	
	Only for students who started the programme prior to September 2019. TRANSITIONAL REGULATION: Students started the programme prior to September 2019 will be able to finish their programme until September 2020 (excl.). For the educational units which no longer will be offered as of September 2019 and which students have not completed successfully, a resit option for (all components of) the educational unit will be given until September 2020 (excl.).
Keywords	
Teaching methods	PBL / Lecture
Assessment methods	Participation / Written Exam / Assignment
Evaluation in previous academic year	For the complete evaluation of this course please click http://iwio-sbe.maastrichtuniversity.nl/rapporten.asp?referrer=codeUM
This course belongs to the following programme / specialisation	