

## Course descriptions

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## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Management	
<b>Course ID:</b> FM.KIS/269APE/21	<b>Course title:</b> Business Analytics and Business Processes Modeling
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week:</b> <b>per level/semester:</b> 32s <b>Form of the course:</b> combined	
<b>Number of credits:</b> 8	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> EXPECTED KNOWLEDGE THE STUDENT IS REQUIRED TO HAVE Basic understanding of processes, models and statistical methods. Working with MS Office, Teams. Skills to work with literature sources.	
<b>Course requirements:</b> To be able to perform business analytics using well known software tools and to be able to model different kinds of business processes. Scale of assessment (preliminary/final): 0 / 100%	
<b>Learning outcomes:</b> STATEMENT OF COURSE OBJECTIVES a) To assist students in understanding the issues and problems in modelling, prioritization, competency, assessment, and evaluation of analytical models. b) To enable students to learn the modelling of business processes, describing them with the use of BPMN. c) To prepare students for participation as users or managers in the modeling of business processes and simulation of their behavior. d) To assist students in research of the latest trends of business process analytics and modeling giving them necessary mathematical and analytical tools and methods.	
<b>Class syllabus:</b> COURSE DESCRIPTION The course concentrates on analytics of business processes. This course is built on the previous courses of management, statistics, ... It develops analytical skills in modelling, prioritization, competency, assessment, and evaluation of analytical models. It lays the foundation of the business process modelling, orchestration, choreographies and explaining the architecture and methodology. It explains the evolution of enterprise system architecture, describes processes in standard BPMN notation and highlights the typical architectures and methodologies. This course provides the student with the knowledge and skills necessary to understand and use information technology to in depth analyze and model business processes with all interactions with the environment. The	

necessary mathematical tools are discussed in the last part as such as Stochastic Decision-Making Models, Mathematical Programming Models, Multi-Attribute Decision-Making, Modeling with Game Theory, Regression, Discrete Dynamical Systems Models, Simulation modelling and others. This course provides the students with the knowledge and skills necessary to understand and use information technology to analyze and model business processes effectively and shows how business process analytics provides organizations with a strategic competitive advantage.

#### **SCHEDULE**

Lecture 1 Business Analytics Model

Lecture 2 Business Analytics at the Strategic Level and Functional Level

Lecture 3 Business Analytics at the Analytical Level and Data Warehouse Level

Lecture 4 Structuring Business Analytics Competency, Assessment and Prioritization

Lecture 5 BP Foundation

Lecture 6 Evolution of Enterprise Systems Architectures

Lecture 7 Business Process Modelling

Lecture 8 Process Orchestrations and Modelling

Lecture 9 Process Choreographies and Properties

Lecture 10 Architectures and Methodologies

Lecture 11 Introduction to Mathematical Modeling for Business Analytics

Lecture 12 Introduction to Stochastic Decision-Making Models for Business Analytics

To be able to benefit fully from each class, it is important to read the scheduled chapters and prepare the assigned Case Problems.

The general format of each class will be:

- review of assigned reading and discussion
- lectures interspersed with group and class discussion of relevant case studies
- class review of term projects
- online using MS Teams, otherwise on site if pandemic situation permits

#### **Recommended literature:**

- LAURSEN, Gert a Jasper THORLUND. Business analytics for managers : taking business intelligence beyond reporting. Second edition. vyd. Wiley, 2016, 2017. Wiley & SAS business series. ISBN 978-1-119-30252-0.
- WESKE, Mathias. Business Process Management: Concepts, Languages, Architectures. Third Edition. vyd. Berlin, Heidelberg: Springer Berlin Heidelberg, 2019. ISBN 978-3-662-59431-5. DOI: 10.1007/978-3-662-59432-2
- FOX, William P. Mathematical Modeling for Business Analytics. CRC Press Taylor & Francis Group, 2018. ISBN 978-1-138-55661-4.
- Natalia Kryvinska, Michal Greguš: SOA and its Business Value in Requirements, Features, Practices and Methodologies, Univerzita Komenského v Bratislave, 2014, ISBN 978-80223-3764-9
- Michal Greguš, Natalia Kryvinska: Service Orientation of Enterprises – Aspects, Dimensions, Technologies, Bratislava: Comenius University, 2015. ISBN: 978-80-223-3978-0
- Kathy Schwalbe: Information Technology Project Management, Course Technology, Fifth edition, 2008, ISBN 978-0324665215.

#### **Languages necessary to complete the course:**

English

#### **Notes:**

-

<b>Past grade distribution</b>						
Total number of evaluated students: 7						
A	ABS	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b> prof. Ing. Natalia Kryvinska, PhD., Mgr. Olena Shlyakhetko						
<b>Last change:</b> 25.08.2021						
<b>Approved by:</b>						

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Management	
<b>Course ID:</b> FM.KIS/270APE/21	<b>Course title:</b> Business Analytics and Business Processes Modeling
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week: per level/semester:</b> 32s <b>Form of the course:</b> combined	
<b>Number of credits:</b> 8	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> EXPECTED KNOWLEDGE THE STUDENT IS REQUIRED TO HAVE Basic understanding of processes, models and statistical methods. Working with MS Office, Teams. Skills to work with literature sources.	
<b>Course requirements:</b> To be able to perform business analytics using well known software tools and to be able to model different kinds of business processes. Scale of assessment (preliminary/final): 0 / 100%	
<b>Learning outcomes:</b> STATEMENT OF COURSE OBJECTIVES a) To assist students in understanding the issues and problems in modelling, prioritization, competency, assessment, and evaluation of analytical models. b) To enable students to learn the modelling of business processes, describing them with the use of BPMN. c) To prepare students for participation as users or managers in the modeling of business processes and simulation of their behavior. d) To assist students in research of the latest trends of business process analytics and modeling giving them necessary mathematical and analytical tools and methods.	
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Lecture 3 Business Analytics at the Analytical Level and Data Warehouse Level

Lecture 4 Structuring Business Analytics Competency, Assessment and Prioritization

Lecture 5 BP Foundation

Lecture 6 Evolution of Enterprise Systems Architectures

Lecture 7 Business Process Modelling

Lecture 8 Process Orchestrations and Modelling

Lecture 9 Process Choreographies and Properties

Lecture 10 Architectures and Methodologies

Lecture 11 Introduction to Mathematical Modeling for Business Analytics

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- WESKE, Mathias. Business Process Management: Concepts, Languages, Architectures. Third Edition. vyd. Berlin, Heidelberg: Springer Berlin Heidelberg, 2019. ISBN 978-3-662-59431-5. DOI: 10.1007/978-3-662-59432-2
- FOX, William P. Mathematical Modeling for Business Analytics. CRC Press Taylor & Francis Group, 2018. ISBN 978-1-138-55661-4.
- Natalia Kryvinska, Michal Greguš: SOA and its Business Value in Requirements, Features, Practices and Methodologies, Univerzita Komenského v Bratislave, 2014, ISBN 978-80223-3764-9
- Michal Greguš, Natalia Kryvinska: Service Orientation of Enterprises – Aspects, Dimensions, Technologies, Bratislava: Comenius University, 2015. ISBN: 978-80-223-3978-0
- Kathy Schwalbe: Information Technology Project Management, Course Technology, Fifth edition, 2008, ISBN 978-0324665215.

#### **Languages necessary to complete the course:**

English

#### **Notes:**

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<b>Past grade distribution</b>						
Total number of evaluated students: 11						
A	ABS	B	C	D	E	FX
63,64	0,0	36,36	0,0	0,0	0,0	0,0
<b>Lecturers:</b> prof. Ing. Natalia Kryvinska, PhD., Mgr. Olena Shlyakhetko						
<b>Last change:</b> 25.08.2021						
<b>Approved by:</b>						

## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Management	
<b>Course ID:</b> FM/Diz10/16	<b>Course title:</b> Dissertation Examination
<b>Number of credits:</b> 10	
<b>Educational level:</b> III.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	



## STATE EXAM DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Management	
<b>Course ID:</b> FM/O3/11	<b>Course title:</b> Dissertation Thesis Defence
<b>Number of credits:</b> 30	
<b>Educational level:</b> III.	
<b>State exam syllabus:</b>	
<b>Last change:</b>	
<b>Approved by:</b>	

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023						
<b>University:</b> Comenius University Bratislava						
<b>Faculty:</b> Faculty of Management						
<b>Course ID:</b> FM/002P/18		<b>Course title:</b> Publications, participation in conferences, teaching, projects solving etc.				
<b>Educational activities:</b> <b>Type of activities:</b> <b>Number of hours:</b> <b>per week: per level/semester:</b> <b>Form of the course:</b> on-site learning, combined						
<b>Number of credits:</b> 153						
<b>Recommended semester:</b> 1., 2., 3., 4., 5., 6..						
<b>Educational level:</b> III.						
<b>Prerequisites:</b>						
<b>Course requirements:</b>						
<b>Learning outcomes:</b>						
<b>Class syllabus:</b>						
<b>Recommended literature:</b>						
<b>Languages necessary to complete the course:</b>						
<b>Notes:</b>						
<b>Past grade distribution</b> Total number of evaluated students: 176						
A	ABS	B	C	D	E	FX
9,09	90,91	0,0	0,0	0,0	0,0	0,0
<b>Lecturers:</b> Mgr. Andrea Studeničová						
<b>Last change:</b>						
<b>Approved by:</b>						

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Management	
<b>Course ID:</b> FM.KIS/267APE/21	<b>Course title:</b> Service Analytics and Service Systems Modeling
<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week: per level/semester:</b> 32s <b>Form of the course:</b> combined	
<b>Number of credits:</b> 8	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
<b>Prerequisites:</b>	
<b>Recommended prerequisites:</b> -	
<b>Course requirements:</b> To be able to perform service analytics using well known software tools and to be able to model different kinds of service processes. Scale of assessment (preliminary/final): 0 / 100%	
<b>Learning outcomes:</b> Course Description and Objectives At large, the term “services” is associated with Web services and alike. However, there is a much vaster layer to be considered within the remarkable growth of the service sector, which has come to dominate business activity in most advanced economies over the last decades. Besides, the opportunity to innovate in services, to realize the business and societal value from knowledge about service, to research, develop, and deliver new information services and business services increases continuously. Making up a significant part of the world economy, the service sector is a rapidly evolving field that is relied on to dictate the public's satisfaction and success in various areas of everyday life, from banking and communications to education and healthcare. Accordingly, the objective of the course of is to provide students of the service-related disciplines with the qualitative and quantitative skills necessary to model key decisions and performance metrics associated with services, including the management of resources, distribution of goods and services to customers, and the analysis and design of service systems. This course covers several aspects including: service systems, modeling, innovation, and service-oriented architectures. The course will investigate also the nature of services, the need for interdisciplinary approaches to services innovation, and the technology and tools needed to provide services innovation. At the end of this course, students will be able to: <ul style="list-style-type: none"> <li>• understand and critique the ways in which researchers and practitioners are defining services and SA;</li> <li>• articulate the motivation behind the study of SA and relate their own experiences to the study of it;</li> <li>• apply theories that are emerging in the area of SA and identify current limitations in applying</li> </ul>	

those theories;

- identify the multidisciplinary aspects of research projects;
- demonstrate ways in which organizations are changing what they do through innovative uses of service-oriented technologies and discuss the implications of these changes;
- evaluate ways in which social computing technologies are providing innovations in services (specifically in providing greater opportunities for co-production);

describe and discuss the general notion of service-oriented architecture and how its techniques can be used to architect services.

### **Class syllabus:**

Part 1: What are Services? - This part focuses on introducing a comprehensive set of definitions of services. It includes materials that provide early definitions and thoughts on services. This survey of services is meant to provide some context around the burgeoning study of services and impact on modern economies.

Part 2: Management of Services / Service Level Management - The focus of this part is to introduce students to the notions about what differs in the management of services versus traditional operations or manufacturing management, namely:

- creating a services strategy and the unique aspects of services management planning;
- competitive role of information in services development;
- process analysis;
- diverse marketing&management challenges in services.

Part 3: Productivity and Innovation - This part is the foundation for uncovering different types of service innovation opportunities. It aims to gain a frame of reference about productivity conundrums, develop a point of view and be able to discuss this with others. It also considers the issue - what are the relationships between innovation and productivity.

Part 4: Service Engineering and Systems - This part focuses on the general description of systems and their relevance to services. Services can be viewed as socio-technological systems and differ somewhat from a manufacturing system or economic system. All three systems include elements, interconnections, attributes, and stakeholders. These components can be represented by an input, throughput, output process model where, in a services system there is a feedback loop that defines a service engagement.

Part 5: Service Science and Modeling - This part includes specific considerations for the use of methods in the services lifecycle from engagement through solutions design and delivery. The primary context for the discussions in this part is an IT services business. The part-5 depends on the students to have an understanding of today's increasing globalization of business and familiarity with the "What are Services". The queuing theory methods as well as techniques in optimization and adaptive decision-making will be introduced.

Part 6: Services and Software Architectures Infrastructure and Engineering - The Internet-based economy is gearing towards the real world of fully automated business processes. Automated services have emerged as the next generation of Web based technology for exchanging information over the Internet and promise to revolutionize the process of developing and deploying distributed software applications. Service Oriented Architecture is a logical way of analyzing and designing a software system to provide services to either end-user applications or to other services distributed in the Internet, via published and discoverable interfaces. The objective of this part is to present the principles and fundamental underpinnings of Web Services and Service Oriented Architectures, concentrating on service analysis and design.

Part 7: Service Economics - This part covers service description and structuring as well as the financial evaluation and economic planning behind the services provided. This includes the following topics:

- service portfolio management;
- service level management;

- planning and calculation;
- costing and charging.

**Recommended literature:**

- Daskin, Mark S., Service Science, 1. Edition, John Wiley & Sons, November 2010.
- Katzan Harry Jr, Service Science: Concepts, Technology, Management, iUniverse, Incorporated, November 2008.
- Maglio Paul and Spohrer Jim, Fundamentals of service science, Journal of the Academy of Marketing Science, Vol. 36, Iss. 1, 2008.
- Ching M. Chang, Service Systems Management and Engineering: Creating Strategic Differentiation and Operational Excellence, 1 edition, Wiley, April 2010.
- Bettencourt Lance, Service Innovation: How to Go from Customer Needs to Breakthrough Services, 1 edition, McGraw-Hill, May 2010.
- Papazoglou Michael, Web Services: Principles and Technology, Prentice Hall; 1st Edition, September 2007.
- Michael Bell, Service-Oriented Modeling (SOA): Service Analysis, Design, and Architecture, Wiley, 2008.
- Glushko Robert, Designing a Service Science Discipline with Discipline, IBM Systems Journal, 47(1): 15 27, 2008.
- Glushko Robert, Seven Contexts for Service System Design, in Maglio, P. P., Kieliszewski, C, & Spohrer, J. Handbook of Service Science, 219 249, 2010.
- M. Gregus, N. Kryvinska, "Service Orientation of Enterprises - Aspects, Dimensions, Technologies", 2015, Comenius University in Bratislava, ISBN: 9788022339780.
- N. Kryvinska, M. Gregus, "SOA and its Business Value in Requirements, Features, Practices and Methodologies", 2014, Comenius University in Bratislava, ISBN: 9788022337649.

**Languages necessary to complete the course:**

English

**Notes:**

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**Past grade distribution**

Total number of evaluated students: 9

A	ABS	B	C	D	E	FX
55,56	0,0	44,44	0,0	0,0	0,0	0,0

**Lecturers:** prof. Ing. Natalia Kryvinska, PhD., Mgr. Olena Shlyakhetko

**Last change:** 25.08.2021

**Approved by:**

## COURSE DESCRIPTION

<b>Academic year:</b> 2022/2023	
<b>University:</b> Comenius University Bratislava	
<b>Faculty:</b> Faculty of Management	
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<b>Educational activities:</b> <b>Type of activities:</b> seminar <b>Number of hours:</b> <b>per week: per level/semester:</b> 32s <b>Form of the course:</b> combined	
<b>Number of credits:</b> 8	
<b>Recommended semester:</b>	
<b>Educational level:</b> III.	
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Part 2: Management of Services / Service Level Management - The focus of this part is to introduce students to the notions about what differs in the management of services versus traditional operations or manufacturing management, namely:

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- competitive role of information in services development;
- process analysis;
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**Languages necessary to complete the course:**

English

**Notes:**

-

**Past grade distribution**

Total number of evaluated students: 6

A	ABS	B	C	D	E	FX
100,0	0,0	0,0	0,0	0,0	0,0	0,0

**Lecturers:** prof. Ing. Natalia Kryvinska, PhD., Mgr. Olena Shlyakhetko

**Last change:** 25.08.2021

**Approved by:**