

Biomatrics and Applied Artificial Intelligence Institute			Elective subject 2025-26-2			
Name of the subject:	Code of the subject:	Credits:	Weekly hours:			
				lec	sem	lab
Enterprise Infrastructure in Practice	NBWN11EBNF	4	full-time	2	0	0
Responsible person for the subject: Valéria PÓSER, PhD			Classification: associate professor			
Subject lecturer(s): Valéria Póser, PhD, Experts from Morgan Stanley						
Prerequisites:	NKXKSAEBNF	Comprehensive Exam				
Way of the assessment:	exam					

Course description

Goal:	<p>The course aims to provide students with an insight into the challenges faced by many large organizations today. The challenges of scale (i.e., the challenges of managing and organization with 100,000 desktops are very different to those managing 100), commercial pricing, managing service quality, managing risk, and working effectively in a global organization will be discussed.</p> <p>An appreciation for these challenges and how industry is meeting them will be developed via a review of a number of case studies and practical hands-on examples. Students completing this course will develop a deep appreciation for enterprise technology.</p>
Course description:	<p>Data Center infrastructure and technologies; Enterprise Networks; Virtualization Technologies in Practice; Enterprise IT Components and Operation; Enterprise features of the Linux kernel; Web Technology and Security; Containerization; Cloud Technologies; Agile development; Real Time Market Data; Data Driven Decision Making; Technologies to support ITIL; Ask Us Anything.</p>

Lecture schedule

Education week	Topic
1.	Data Center infrastructure and technologies: How we can better optimize Data center infrastructure by going from physical hardware to virtual solutions.
2.	Virtualization Technologies in Practice: Session overviews the challenges of running thousands of virtual machines, with the aspect of the required software elements, computing resources, storage, networking and managing all of these at that scale
3.	Enterprise Networks: This session gives an overview on providing reliable connectivity in a large enterprise to interconnect tens of thousands of servers and desktops across the globe, using state-of-the-art data networking technology.
4.	Enterprise features of the Linux kernel: A generic introduction to the system that powers a significant portion of enterprises' backend. The lecture also focuses on leveraging eBPF (Extended Berkeley Packet Filter) to add new functionality to the Linux kernel.
5.	Storage: How the IT industry reacted to scalability and high-availability challenges? Lecture will have some typical questions and answers from technology perspective. We are going to focus on traditional (non-cloud) infrastructure.
6.	Enterprise IT Components and Operation: Morgan Stanley continuously maintains and operates a huge and complex infrastructure to run the business. This presentation explains the details of building

	out and manage such large infrastructure. The second part covers some of typical troubleshooting cases one can come across in a complex environment.
7.	Web Technology and Security: Web Technology and security lecture will cover secure web communication and related technologies, TLS, cypher sets, key exchange methods. Additionally, we will cover typical vulnerabilities of web applications like SQL injection and cross side scripting.
8.	Holiday
9.	Containerization: This lecture shows the importance and effects of containerization in modern software development and deployment. The topic will cover different container platforms, such as Podman, and how they can streamline application deployment and scalability.
10.	Cloud Technologies: The presentation covers the exec level perspective for Cloud adoption at a large financial institution, touching on the main barriers of cloud adoption, namely the complexity of the current ICT estate, the cost of migration & integration of legacy & on-premise systems with Cloud applications, the security and compliance with regulatory requirements plus the incompatibility of internal process & the skills of the internal staff. The second part of the presentation gives a few examples how Morgan Stanley addresses these concerns.
11.	Data Driven Decision Making, Machine Learning & integration to platforms, Data Visualization, Data Modeling and Data Quality, Agile methodology.
12.	Agile development: The session will cover both the theoretical (providing answers to questions like: what is the agile “mindset”?, what are the typical roles?, what are the rituals of the teams?, etc.) and the practical aspects of implementing agile development practices (New team or already existing? What are the first steps in moving from waterfall to agile? Typical pitfalls in implementing it, etc.)
13.	Real Time Market Data: Real Time Market data is an essential pillar of electronic trading on modern financial markets such as stock exchanges. The presentation will give an overview of what market data means and how technology helps us in delivering market data with low latency to Morgan Stanley’s trading systems.
14.	Technologies to support ITIL: High level overview of ITIL’s history, structure, key areas & expressions. Hands-on experiences on implemented tools and practices at global companies (Morgan Stanley / AB InBev / BOSCH / Daimler), most popular applications, business-specific opportunities and challenges.
Mid-term requirements	
Conditions for obtaining a mid-term grade/signature	The lectures and the presentations are on English language. The visit of the lectures is obligatory. Requirement of the exam: must not miss more than 50% of the lectures.
Assessment schedule	
Education week	Topic

Method used to calculate the <i>mid-term grade</i> (to be filled out only for subjects with mid-term grades)	
Type of the replacement	
Type of the replacement of written test/mid-term grade/signature	
Type of the exam (to be filled out only for subjects with exams)	
Written exam on English language (Moodle test)	
Calculation of the exam mark (to be filled only for subjects with exams)	
The exam grade will be determined based on the Moodle test.	
Final grade calculation methods:	
0% - 49%: fail (1) 50% - 61%: pass (2) 62% - 73%: satisfactory (3) 74% - 85%: good (4) 86% - 100%: excellent (5)	
References	
Obligatory:	Class materials published in Moodle.
Recommended:	
Other references:	