



СОФИЙСКИ УНИВЕРСИТЕТ "СВ. КЛИМЕНТ ОХРИДСКИ"
ФАКУЛТЕТ ПО МАТЕМАТИКА И ИНФОРМАТИКА

УЧЕБНА ПРОГРАМА

ОКС „магистър”

Избираема дисциплина

Утвърдил:

/декан/

Утвърдена с решение на ФС с протокол:

№ от

редовна форма на обучение										
Магистърска програма:	(код и наименование)	М	І	І	3	3	2	1	2	1
Разпределени системи и мобилни технологии										

Дисциплина:	(код и наименование)	Ф	6	2	0
Автоматизиране на администрирането					
Administration Automation					

Учебната програма е разработена и предложена за утвърждаване от катедра:	
Информационни технологии	
от:	ас. Георги Георгиев

Преподавателските екипи се утвърждават ежегодно от Факултетен съвет.

Заетост и кредити			
		Обща заетост:	150
		Кредити:	5
Учебна заетост	Форма	Хорариум	
Аудиторна заетост	Лекции	30	
	Семинарни упражнения		
	Практически упражнения (хоспитиране)	30	
		<i>Обща аудиторна заетост:</i>	<i>60</i>
		<i>Кредити аудиторна заетост:</i>	<i>2</i>
Извънаудиторна заетост	Подготовка на домашни работи		
	Контролни работи и подготовка за тях	30	
	Учебен проект		
	Самостоятелна работа в библиотека или с интернет ресурси	30	
	Доклад/Презентация		
	Друг вид извънаудиторна заетост		
	Подготовка за изпит	30	
		<i>Обща извънаудиторна заетост:</i>	<i>90</i>
		<i>Кредити извънаудиторна заетост:</i>	<i>3</i>

Предвидена форма на оценяване:	КИ
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И - изпит, КИ - комбинирано изпитване; ТО - текущо оценяване

Формиране на оценката по дисциплината		
№	Показател	%
	Контролни работи	
	Участие в час	
	Домашни работи	
	Учебен проект (разработване и защита)	
	Тестова проверка	33%
	Текуща самостоятелна работа/контролна работа	
	Workshops (информационно търсене и колективно обсъждане)	
	Демонстрационни занятия	
	Участие в тематични дискусии	
	Решаване на казуси	
	Изпит - практика (решаване на задачи)	67%
	Изпит - теория	

Анотация на учебната дисциплина

Курсът е избираем за студентите от I и II курс в магистърската програма "Разпределени системи и мобилни технологии" на направление „Информатика“. Обучението в този курс дава необходимите знания и опит за администриране и автоматизиране на администрирането на сървъри.

Предварителни изисквания

Студентите следва да имат познания по мрежови технологии, опит в администриране, поддръжка и решаване на проблеми в Windows базирани операционни системи, опит в реализиране и поддръжка на Active Directory технологии, вкл. и групови политики.

Забележка: Предоставяните учебни материали в електронен вид, както и междинните тестове и финалния изпит са на английски език.

Очаквани резултати

След успешно преминат курс на обучение студентите ще могат да използват различни техники за автоматизиране на процесите по администриране в големи корпоративни мрежи.

Учебно съдържание

№	Тема	Хорариум л. / с.упр. / пр.
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1	<p>Module 1: Getting started with Windows PowerShell</p> <ul style="list-style-type: none"> • Overview and background of Windows PowerShell • Understanding command syntax • Finding commands <p>Lab: Configuring Windows PowerShell</p> <ul style="list-style-type: none"> • Configuring the Windows PowerShell console • Configuring the Windows PowerShell ISE application <p>Lab: Finding and running basic commands</p> <ul style="list-style-type: none"> • Finding commands • Running commands • Using the About files 	1	1
2	<p>Module 2: Cmdlets for administration</p> <ul style="list-style-type: none"> • Active Directory administration cmdlets • Network configuration cmdlets • Other server administration cmdlets <p>Lab: Windows Administration</p> <ul style="list-style-type: none"> • Creating and managing Active Directory objects • Configuring network settings on Windows Server • Creating a web site 	1	1
3	<p>Module 3: Working with the Windows PowerShell pipeline</p> <ul style="list-style-type: none"> • Understanding the pipeline • Selecting, sorting, and measuring objects • Filtering objects out of the pipeline • Enumerating objects in the pipeline • Sending pipeline data as output <p>Lab: Using the pipeline</p> <ul style="list-style-type: none"> • Selecting, sorting, and displaying data <p>Lab: Filtering objects</p> <ul style="list-style-type: none"> • Filtering objects <p>Lab: Enumerating objects</p> <ul style="list-style-type: none"> • Enumerating objects <p>Lab: Sending output to a file</p> <ul style="list-style-type: none"> • Exporting user information to a file 	2	2
4	<p>Module 4: Understanding how the pipeline works</p> <ul style="list-style-type: none"> • Passing the pipeline data • Advanced considerations for pipeline data <p>Lab: Working with pipeline parameter binding</p> <ul style="list-style-type: none"> • Predicting pipeline behaviour 	1	1

5	<p>Module 5: Using PSProviders and PSDrives</p> <ul style="list-style-type: none"> • Using PSProviders • Using PSDrives <p>Lab: Using PSProviders and PSDrives</p> <ul style="list-style-type: none"> • Creating files and folders on a remote computer • Creating a registry key for your future scripts • Create a new Active Directory group 	1	1
6	<p>Module 6: Querying system information by using WMI and CIM</p> <ul style="list-style-type: none"> • Understanding WMI and CIM • Querying data by using WMI and CIM • Making changes with WMI/CIM <p>Lab: Working with WMI and CIM</p> <ul style="list-style-type: none"> • Querying information by using WMI • Querying information by using CIM • Invoking methods 	2	2
7	<p>Module 7: Working with variables, arrays, and hash tables</p> <ul style="list-style-type: none"> • Using variables. • Manipulating variables. • Manipulating arrays and hash tables. <p>Lab: Working with variables</p> <ul style="list-style-type: none"> • Working with variable types • Using arrays • Using hash tables 	1	1
8	<p>Module 8: Basic scripting</p> <ul style="list-style-type: none"> • Introduction to scripting • Scripting constructs • Importing data from files <p>Lab: Basic scripting</p> <ul style="list-style-type: none"> • Setting a script • Processing an array with a ForEach loop • Processing items by using If statements • Creating a random password • Creating users based on a CSV file 	2	2

9	<p>Module 9: Advanced scripting</p> <ul style="list-style-type: none"> • Accepting user input • Overview of script documentation • Troubleshooting and error handling • Functions and modules <p>Lab: Accepting data from users</p> <ul style="list-style-type: none"> • Querying disk information from remote computers • Updating the script to use alternate credentials • Documenting a script <p>Lab: Implementing functions and modules</p> <ul style="list-style-type: none"> • Creating a logging function • Adding error handling to a script • Converting a function to a module 	2	2
10	<p>Module 10: Administering Remote Computers</p> <ul style="list-style-type: none"> • Using basic Windows PowerShell remoting • Using advanced Windows PowerShell remoting techniques • Using PSSessions <p>Lab: Using basic remoting</p> <ul style="list-style-type: none"> • Enabling remoting on the local computer • Performing one-to-one remoting • Performing one-to-many remoting <p>Lab: Using PSSessions</p> <ul style="list-style-type: none"> • Using implicit remoting • Managing multiple computers 	2	2
11	<p>Module 11: Using background jobs and scheduled jobs</p> <ul style="list-style-type: none"> • Using background jobs • Using scheduled jobs <p>Lab: Using background jobs and scheduled jobs</p> <ul style="list-style-type: none"> • Starting and managing jobs • Creating a scheduled job 	1	1
12	<p>Module 12: Using advanced Windows PowerShell techniques</p> <ul style="list-style-type: none"> • Creating profile scripts • Using advanced techniques <p>Lab: Practicing advanced techniques</p> <ul style="list-style-type: none"> • Creating a profile script • Verifying the validity of an IP address • Reporting disk information • Configuring NTFS permissions • Creating user accounts with passwords from a CSV file <p>Lab: Practicing script development (optional)</p> <ul style="list-style-type: none"> • TBA 	2	2

13	<p>Module 13: Creating advanced functions</p> <ul style="list-style-type: none"> • Converting a command into an advanced function • Creating a script module • Defining parameter attributes and input validation • Writing functions that accept pipeline input • Producing complex pipeline output • Documenting functions by using comment-based help • Supporting -WhatIf and -Confirm <p>Lab: Converting a command into an advanced function</p> <ul style="list-style-type: none"> • Converting a command into an advanced function <p>Lab: Creating a script module</p> <ul style="list-style-type: none"> • Creating a script module <p>Lab: Defining parameter attributes and input validation</p> <ul style="list-style-type: none"> • Defining parameter attributes and input validation <p>Lab: Writing functions that accept pipeline input</p> <ul style="list-style-type: none"> • Writing functions that accept pipeline input <p>Lab: Producing complex pipeline output</p> <ul style="list-style-type: none"> • Producing complex pipeline output <p>Lab: Documenting functions by using comment-based help</p> <ul style="list-style-type: none"> • Documenting functions by using comment-based help <p>Lab: Supporting -WhatIf and -Confirm</p> <ul style="list-style-type: none"> • Supporting -WhatIf and -Confirm 	2	2
14	<p>Module 14: Using Microsoft .NET Framework and REST API in Windows PowerShell</p> <ul style="list-style-type: none"> • Using Microsoft .NET Framework in Windows PowerShell • Using REST API in Windows PowerShell <p>Lab: Using Microsoft .NET Framework in Windows PowerShell</p> <ul style="list-style-type: none"> • Using Microsoft .NET Framework in Windows PowerShell <p>Lab: Using REST API in Windows PowerShell</p> <ul style="list-style-type: none"> • Using REST API in Windows PowerShell 	2	2
15	<p>Module 15: Writing controller scripts</p> <ul style="list-style-type: none"> • Introducing controller scripts • Writing controller scripts that display a user interface • Writing controller scripts that produce reports <p>Lab: Writing controller scripts</p> <ul style="list-style-type: none"> • Writing controller scripts that display a user interface • Writing controller scripts that implement a text-based menu <p>Lab: Writing controller scripts that produce HTML reports</p> <ul style="list-style-type: none"> • Writing functions to be used in the controller script • Writing a controller script that produces HTML reports 	2	2

16	<p>Module 16: Handling script errors</p> <ul style="list-style-type: none"> • Understanding error handling • Handling errors and timeouts in a script <p>Lab: Handling errors in a script</p> <ul style="list-style-type: none"> • Handling errors in a script 	1	1
17	<p>Module 17: Using XML, JSON, and custom-formatted data</p> <ul style="list-style-type: none"> • Reading, manipulating, and writing XML-formatted data • Reading, manipulating, and writing JSON-formatted data • Reading and manipulating custom-formatted data <p>Lab: Reading, manipulating, and writing XML-formatted data</p> <ul style="list-style-type: none"> • Testing the provided tools • Updating an XML inventory document 	1	1
18	<p>Module 18: Enhancing server management with Desired State Configuration and Just Enough Administration</p> <ul style="list-style-type: none"> • Understanding Desired State Configuration • Creating and deploying a DSC configuration • Implementing Just Enough Administration <p>Lab: Creating and deploying a DSC configuration</p> <ul style="list-style-type: none"> • Creating and deploying a DSC configuration <p>Lab: Configuring and using JEA</p> <ul style="list-style-type: none"> • Configuring and using JEA 	2	2
19	<p>Module 19: Analyzing and debugging scripts</p> <ul style="list-style-type: none"> • Debugging in Windows PowerShell • Analyzing and debugging an existing script <p>Lab: Analyzing and debugging an existing script</p> <ul style="list-style-type: none"> • Analyzing and debugging an existing script 	1	1
20	<p>Module 20: Understanding Windows PowerShell Workflow</p> <ul style="list-style-type: none"> • Understanding Windows PowerShell Workflow <p>Lab: Creating and running a Windows PowerShell Workflow</p> <ul style="list-style-type: none"> • Creating and running a Windows PowerShell Workflow 	1	1

Конспект за изпит	
№	Въпрос
1	Getting started with Windows PowerShell
2	Cmdlets for administration
3	Working with the Windows PowerShell pipeline
4	Understanding how the pipeline works
5	Using PSProviders and PSDrives

6	Querying system information by using WMI and CIM
7	Working with variables, arrays, and hash tables
8	Basic scripting
9	Advanced scripting
10	Administering Remote Computers
11	Using background jobs and scheduled jobs
12	Using advanced Windows PowerShell techniques
13	Creating advanced functions
14	Using Microsoft .NET Framework and REST API in Windows PowerShell
15	Writing controller scripts
16	Handling script errors
17	Using XML, JSON, and custom-formatted data
18	Enhancing server management with Desired State Configuration and Just Enough Administration
19	Analyzing and debugging scripts
20	Understanding Windows PowerShell Workflow

Библиография	
Основна	
1. http://rsmt.it.fmi.uni-sofia.bg/moc10961/	
Допълнителна	
1. MOC # 10961-C: Automating Administration With Windows PowerShell/ Student book	
2. MOC # 10962-C: Advanced Automated Administration With Windows PowerShell/ Student book	

Дата: 17.05.2021

Съставил: Г.Георгиев

Програмата е приета на заседание на КС – протокол от

