



स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड - ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

स्वामी रामानंद तीर्थ
मराठवाडा विद्यापीठ, नांदेड

Established on 17th September, 1994. Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'B++' grade

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विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत राष्ट्रीय
शैक्षणिक धोरण २०२० नुसार पदव्यूत्तर
द्वितीय वर्षाचे अभ्यासक्रम (Syllabus)
शैक्षणिक वर्ष २०२४-२५ पासून लागू
करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, या विद्यापीठा अंतर्गत येणा-या सर्व संलग्नित महाविद्यालयामध्ये शैक्षणिक वर्ष २०२४-२५ पासून राष्ट्रीय शैक्षणिक धोरणानुसार पदव्यूत्तर द्वितीय वर्षाचे अभ्यासक्रम लागू करण्याच्या दृष्टीकोनातून विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत येणा-या अभ्यासमंडळांनी तयार केलेल्या पदव्यूत्तर द्वितीय वर्षाच्या अभ्यासक्रमांना मा. विद्यापरिषदेने दिनांक १५ मे २०२४ रोजी संपन्न झालेल्या बैठकीतील विषय क्रमांक १५/५९-२०२४ च्या ठरावाअन्वये मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील खालील एम. एस्सी द्वितीय वर्षाचे अभ्यासक्रम (Syllabus) लागू करण्यात येत आहेत.

- 1) M. Sc. II year - Analytical Chemistry (Affiliated College)
- 2) M. Sc. II year - Biochemistry (Affiliated College)
- 3) M. Sc. II year - Organic Chemistry (Affiliated College)
- 4) M. Sc. II year - Physical Chemistry (Affiliated College)
- 5) M. Sc. II year - Inorganic Chemistry (Affiliated College)
- 6) M. Sc. II year - Analytical Chemistry (Campus)
- 7) M. Sc. II year - Industrial Chemistry (Campus)
- 8) M. Sc. II year - Medicinal Chemistry (Campus)
- 9) M. Sc. II year - Organic Chemistry (Campus)
- 10) M. Sc. II year - Physical Chemistry (Campus)
- 11) M. Sc. II year - Polymer Chemistry (Campus)
- 12) M. Sc. II year - Computer Management (Affiliated College)
- 13) M. Sc. II year - Computer Science (Affiliated College)
- 14) M. Sc. II year - Software Engineering (Affiliated College)
- 15) M. Sc. II year - System Administration & Networking (Affiliated College)
- 16) M. Sc. II year - Computer Application (Campus)
- 17) M. Sc. II year - Computer Network (Campus)
- 18) M. Sc. II year - Computer Science (Campus)
- 19) M. Sc. II year - Zoology (Campus)
- 20) M. Sc. II year - Zoology (Affiliated College)
- 21) M. Sc. II year - Physics (Campus)
- 22) M. Sc. II year - Physics (Affiliated College)

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या www.srtmun.ac.in या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

'ज्ञानतीर्थ' परिसर,

विष्णुपुरी, नांदेड - ४३१ ६०६.

जा.क्र.:शै-१/एनइपी/विवत्रविपदवी/२०२४-२५/११३

दिनांक १३.०६.२०२४

प्रत : १) मा. आधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.

२) मा. संचालक, परीक्षा व मुल्यमापन मंडळ, प्रस्तुत विद्यापीठ.

३) मा. प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.

४) मा. संचालक, सर्व संकुले परिसर व उपपरिसर, प्रस्तुत विद्यापीठ

५) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, सदर परिपत्रक संकेतस्थळावर

प्रसिध्द करण्यात यावे.

डॉ. सरिता लोसरवार

सहा.कुलसचिव

शैक्षणिक (१-अभ्यासमंडळ) विभाग

SWAMI RAMANAND TEERTH

MARATHWADA UNIVERSITY, NANDED - 431 606



**(Structure and Syllabus of Two Years PG Degree Program with
Multiple Entry and Exit Option)**

TWO YEAR MASTERS PROGRAMME IN
SCIENCE

**Subject System Administration and
Networking**

Under the Faculty of

Science and Technology

Effective from Academic year 2023 – 2024

(As per NEP-2020)

Swami RamanandTeerthMarathwada University

Nanded

(Affiliated Colleges)



Faculty of Science and Technology

NEP-2020 Oriented Structure of Post Graduate Programs

(as per Govt of Maharashtra GR dated 16-05-2023)

M.Sc. System Administration and Networking

(Affiliated Colleges)

(Second Year)

Introduced from Academic Year 2024-2025

Swami RamanandTeerthMarathwada University, Nanded

Faculty of Science and Technology

NEP-2020 oriented Structure of Two years Post Graduate Program

Subject: System Administration and Networking(Affiliated Colleges)

Introduced from Academic Year 2023-2024 (as per Govt of Maha GR dated 16-05-2023)

Program Year and Sem	Level	Semester	Faculty	Major / Mandatory / SDSC	Electives / SDSC	Other courses	RM /others	OJT/FP/ RP	Total Sem. credits	Cumulative Credits	
Second Year is program for PG programs in the affiliated colleges			Theory	Practical	Theory	Practical					
			(04 credits)	(01credits)	(04 credits)	(03+01)	(02 credits)	(04 credits)	(04 credits)		
M.Sc. SAN	6.5	Third Semester	SSANCP-501 SSANCP-02	SSANC-501 SSANC-502 SSANC-503	SSANE-501 (FROM SAME SCHOOL/DEPT)	-----	-----	-----	SSANR-551	22	66
M.Sc. SAN	6.5	Fourth Semester	SSANCP-551 SSANCP-552	SSANC-551 SSANC-552	SSANE-551 (FROM SAME SCHOOL/DEPT)	-----	SVECP -551 Publication ethics	-----	SSANR-552 (06 credits)	22	88
<p>Exit Option: After completion of Second year as above with cumulative 88 credits, student will be awarded M.Sc. in Computer Science Degree depending upon enrollment and completion of program specific core and electives courses **</p> <p>** (for students who have done 03 years UG program)</p>											

**Program Specific Syllabus: Third Semester
M.Sc. System Administration and Networking**

Core Courses Code	Title	Remarks Credits
SSANC-501	Cloud Computing	04
SSANC-502	Network Administration (Switching)	04
SSANC-503	Windows ADC Part –I	04
SSANCP-501	Lab 7: Network Administration (Switching)	01
SSANCP-502	Lab 8: Windows ADC Part –I	01
SSANE-501	Choose any one A. Windows Operating Systems B. VM Ware C. Data Mining and Data Warehousing D. Subject relevant MOOC (NPTEL / SWAYAM / RUSA sponsored Future Oriented Courses / Other recognized \$\$	03 Theory and 01 Lab
SSANR-551	Research Project	04

**Program Specific Syllabus: Fourth Semester
M.Sc. System Administration and Networking**

Core Courses Code	Title	Remarks Credits
SSANC-551	Exchange Server	04
SSANC-552	Windows ADC Part – II	04
SSANCP-551	Lab 9: Exchange Server	01
SSANCP-552	Lab 10: Windows ADC Part – II	01
SSANE-551	Choose any one A. Introduction to Next Generation Networks B. Distributed System C. Internet of Things (IoT) D. Subject relevant MOOC (NPTEL / SWAYAM / RUSA sponsored Future Oriented Courses / Other recognized \$\$	03 Theory and 01 Lab
SVECP-551	Publication Ethics	02
SSANR-552	Research Project	06

M. Sc. Second Year, Semester III (Level 6.5):Teaching Scheme

	Course Code	CourseName	CreditsAssigned per course			TeachingScheme (Hrs./ week) per course	
			Theory	Practical	Total	Theory	Practical
Major	SSANC-501 to SSANC-503	All Core Course	12	--	12	12	--
Elective	SSANE-501 and SSANE-551	All Elective Courses	03	--	03	03	--
Special Courses	SSANR-501	Research Project	--	04	04	--	02
Major Practical	SSANCP-501 to SSANCP-502	All Core labs	--	02	02	--	02
Elective Practical	SSANE-501	Elective lab	--	01	01	--	01
Total Credits per semester			15	07	22	15	05

M. Sc. Second Year, Semester IV (Level 6.5):Teaching Scheme

	Course Code	CourseName	CreditsAssigned per course			TeachingScheme (Hrs./ week) per course	
			Theory	Practical	Total	Theory	Practical
Major	SSANC-551 to SSEC-552	All Core Course	08	--	08	08	--
Elective	SSANE-551	All Elective Courses	03	--	03	03	--
Special Courses	SSANR-551	Research Project	--	06	06	--	04
Special Courses	SVECP -C551	Publication ethics	--	02	02		01
Major Practical	SSANCP -551 and SSANCP -552	All Core labs	--	02	02	--	02
Elective Practical	SSANE-551	Elective lab	--	01	01	--	01
Total Credits per semester			11	11	22	11	08

M. Sc. Second Year, Semester III and IV (Level 6.5) :Examination Scheme

Course Code (2)	CourseName (3)	Theory				Practical		Total Col (6+7) / Col (8+9) (10)
		Continuous Assessment (CA)			ESA	CA (8)	ESA (9)	
		Test I (4)	Test II (5)	Avg of (T1+T2)/2 (6)	Total (7)			
SSANC-501 to SSANC-503 and SSANC-551 to SSANC-552	All core courses	20	20	20	80	--	--	100
SSANE-501 and SSANE-551	All elective courses	15	15	15	60	--	--	75
Special Courses	SSER-501	--	--	--	--	25	75	100
Special Courses	SSER-551					50	100	150
SSANCP-501 to SSANCP-502 and SSANCP -551 to SSANCP -552	All Core Labs	--	--	--	--	05	20	25
SSANE-501 and SSANE-551	All Elective labs	--	--	--	--	05	20	25

Guidelines for Course Assessment:

- A. Continuous Assessment (CA) (20% of the Maximum Marks):** This will form 20% of the Maximum Marks and will be carried out throughout the semester. It may be done by conducting **Two Tests** (Test I on 40% curriculum) and **Test II** (remaining 40% syllabus). Average of the marks scored by a student in these two tests of the theory paper will make his **CA** score (col. 6).
- B. End Semester Assessment (80% of the Maximum Marks):** *(For illustration we have considered a paper of 04 credits, 100 marks and need to be modified depending upon credits of an individual paper)*
1. **ESA Question paper will consists of 6 questions, each of 20 marks.**
 2. **Students are required to solve a total of 4 Questions.**
 3. **Question No.1 will be compulsory and shall be based on entire syllabus.**
 4. **Students need to solve ANY THREE of the remaining Five Questions (Q.2 to Q.6) and shall be based on entire syllabus.**
- C. Question paper of campus and affiliated colleges shall be different**

Note:Number of lectures required to cover syllabus of a course depends on the number of credits assigned to a particular course. One credit of theory corresponds to 15 Hours lecturing and for practical course one credit corresponds to 30 Hours. For example, for a course of two credits 30 lectures of one hour duration are assigned, while that for a three credit course 45lectures.

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Code SSANC- 501	ThirdSemester	CloudComputing	Credits:04 Marks:80 Hours-50
CourseObjectives:			
<ul style="list-style-type: none"> ToStudybasicsofcloudcomputing,andcomprehendtheterminology,toolsandtechnologiesassociatedwithtoday's topcloud platforms. Toprovidetheprogrammer'sperspectiveofworkingofCloudComputing. ImplementSimpleCloudprogramstosolvesimpleproblem. 			
CourseOutcomes:			
Students will be able to:			
<ul style="list-style-type: none"> Explore Cloudcomputing Explore Webservices,AJAXandmashups Understand MapReduceandextensions 			
UnitI	Introduction		
Introduction,Mainframearchitecture,Client-serverarchitecture,3-tierarchitectureswithTPmonitors,Internettechnologyandweb-enabledapplications,Webapplicationservers,Internetofservices			
UnitII	Softwareasaserviceandcloudcomputing		
Emergenceofsoftwareasaservice,SuccessfulSaaSarchitectures,Dev2.0platforms,Cloudcomputing,Dev2.0inthecloudforenterprises,Infrastructureasaservice:AmazonEC2,Platformasaservice:Google App Engine, MicrosoftAzure			
UnitIII	Datainthecloud		
Relationaldatabases,Cloudfilesystems:GFSandHDFS,BigTable,HBBaseandDynamo,Clouddatastores: Data store and Simple DB			
UnitIV	Dev2.0platforms		
Salesforce.com'sForce.complatform,TCSInstantAppsonAmazoncloud,MoreDev2.0platformsandrelated efforts,Advantages,applicabilityandlimitsofDev2.0			
UnitV	Webservices,AJAXandmashups		
Webservices:SOAPandREST,SOAPversusREST,AJAX:asynchronous'rich'interfaces,Mashups: userinterfaceservices			
UnitVI	MapReduceandextensions		
Parallelcomputing,TheMapReducemodel,ParallelefficiencyofMapReduce,RelationaloperationsusingMapReduce,Enterprisebatchprocessingusing MapReduce			
ReferenceBooks:			
EnterpriseCloudComputing:Technology,Architecture,ApplicationByGautamShroff			

Code SSANC-502	ThirdSemester	NetworkAdministration(Switching)	Credits:04 Marks:80 Hours-50
CourseObjectives:			
<ul style="list-style-type: none"> • DescribetherolesofVirtualTruckingProtocolandplacetheseprotocolsinthecontextofmodernnetworkdesign • UnderstandtruckingprotocolslikeIEEE802.1QandISLaccordingtoindustryrequirement • BriefunderstandingofVLANs&Trunks&CISCOSwitches. 			
CourseOutcomes:			
Students will be able to:			
<ul style="list-style-type: none"> • EstablishEndtoEndcommunicationbetweendevices. • ConfigureIPSubnet&VLANprotocols • ConfigureNAT&ACL • Understands VirtualPrivateNetworks 			
UnitI	LANSwitching		
LANSwitchingConcepts,HistoricalProgression.Hubs,Bridges,andSwitches,SwitchingLogic,Accessing the Cisco Catalyst 2960 Switch CLI , Cisco Catalyst Switches and the 2960 Switch , SwitchStatusfromLEDs,AccessingtheCiscoIOSCLI,CLIAccessfromtheConsole,AccessingtheCLI withTelnetandSSH,PasswordSecurityforCLIAccess			
UnitII	VirtualLANs		
VirtualLANConcepts,TruckingwithISLland802.1Q,IPSubnetsandVLANs,VLANTrucking Protocol(VTP), VLANandVLANTruckingConfigurationandVerification,VTPConfigurationandVerification.			
UnitIII	InfrastructureServices		
ConfigureandverifyDHCPonarouter,Configure,verify,andtroubleshootinsidesourceNAT,Static NATConfiguringandVerification,DynamicNATConfiguringandVerification,PATConfiguringandVerification, BGPprotocolconfiguration&verification.			
UnitIV	IPVersion6		
GlobalUnicastAddressing,Routing,andSubnetting,IPv6ProtocolsandAddressing,ConfiguringIPv6Routing andRoutingProtocols, IPv6TransitionOptions			
UnitV	InfrastructureSecurity		
Configure,verify,andtroubleshootportsecurity,Configure,verify,andtroubleshootIPv4andIPv6 accesslistfortrafficfiltering–StandardACL,ExtendedACL,Configure,verify,andtroubleshootbasicdevice - Localauthentication,Securepassword,AccesstodeviceSourceaddress,Telnet/SSH			
UnitVI	VirtualPrivateNetworks		
VPNFundamentals,IPsecVPNs,SSLVPNs,TypesofVPN			
ReferenceBooks:			
CCENT/CCNAICND1(SecondEdition)-WendellOdom			

Code SSANC- 503	ThirdSemester	WindowsADCPart-I	Credits:04 Marks:80 Hours-50
CourseObjectives:			
<ul style="list-style-type: none"> • ConfigureandTroubleshootDomainNameSystem • MaintainActiveDirectoryDomainServices • ManageUserandServiceAccounts • ImplementGroupPolicyInfrastructure 			
CourseOutcomes:			
Students will be able to:			
<ul style="list-style-type: none"> • Perform domainconfiguration • Performgrouppolicy. • ConfigureHyper-V 			
UnitI	Installingandconfiguringservers		
Installservers,Configureservers,Configurelocalstorage(Emphasisonwindowsserver2012)			
UnitII	Configuringserverrolesandfeatures		
Configurefileandshareaccess,Configureprintanddocumentservices,Configureserversforremotemanagement			
UnitIII	ConfiguringHyper-V		
.CreateandconfigurevirtualmachinesettingsCreateandconfigurevirtualmachinestorage,Createandconfigure virtual networks			
UnitIV	Deployingandconfiguringcorenetworkservices		
ConfigureIPv4andIPv6addressing,Configureservers,DeployandconfiguretheDNSservice			
UnitV	InstallingandadministeringActiveDirectory		
Installdomaincontrollers,CreateandmanageActiveDirectoryusers,CreateandmanageActive Directorygroups			
UnitVI	CreatingandmanagingGroupPolicy		
CreateGroupPolicyObjects,Configuresecuritypolicies,Configureapplicationrestrictionpolicies, ConfigureWindowsFirewall			
ReferenceBooks:			
MCTSSelf-PacedTrainingKit(Exam70-410):InstallingandConfiguringWindowsServer2012			

Code SSANCP-501	ThirdSemester	NetworkAdministration(Switching)	Credits:01
Note: Conduct at least 15 practicals on the given syllabus			

CodeSS ANCP- 502	ThirdSemester	WindowsADCPart-I	Credits:01
Note: Conduct at least 15 practicals on the given syllabus			

CodeSS ANE- 501A	ThirdSemester	Elective WindowsOperatingSystems	Credits:03
CourseObjectives:			
<ul style="list-style-type: none"> • ConfigureandmanagetheWindows7desktop • Windows7remotecapabilitiesandutilities • HowtouseWindowsFirewallwithadvancedfeaturesandnetworkprofiles • EvolutionoftheWindowsDesktopOperatingSystem • ConfigureandusetheUseraccountcontrolinvariousnetworkprofiles 			
CourseOutcomes:			
Students will be able to:			
<ul style="list-style-type: none"> • MonitorandtroubleshootWindows7computersforproblemswiththeoperatingsystem,hardware, networksecurity,andapplications • ConfigureBit-locker. • Configureapplicationsoftwarepolicy. 			
UnitI	Introduction		
WindowsOperatingSystem,HistoryofWindowsOS,AdvantagesofWindows7&Windows8, HardwareRequirement,InstallationStepsforWindows7,InstallationStepsforWindows8			
UnitII	ConfiguringandDeployingSystemImages		
CapturingSystemImages,ManagingVirtualHardDiskFiles,ManagingaSystemImageBeforeDeployment, Deploying Images.			
UnitIII	ManagingDevices		
.ManagingDeviceDriversandDevices,ManagingDisks,ApplicationCompatibility,Managing AppLockerandSoftware,ConfiguringIPv4,ConfiguringIPv6,Network Configuration.			
UnitIV	WindowsServices		
ManagingWindowsFirewall,SharingResources,FolderandFileAccess,ManagingBitLocker,ManagingUserAccountControl,Windows7AuthenticationandAuthorization.			
UnitV	WindowsTools		
ManagingDirectAccess,RemoteConnections,Windows7Mobility,UpdatingWindows7,Configuring InternetExplorer			
UnitVI	Monitoring&Backup		
Windows7Mobility,UpdatingWindows7,ConfiguringInternetExplorer,MonitoringSystems, ConfiguringPerformanceSettings.Backup,SystemRecover,RecoveringFilesandFolders.			
ReferenceBooks:			
MCTS70-680Configuring-Windows-7TrainingKit–MicrosoftPublication			

CodeSS ANE- 501A	ThirdSemester	Elective WindowsOperatingSystems	Credits:01
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Note: Conduct at least 15 practical on the given syllabus

CodeSS ANE- 501B	ThirdSemester	Elective VMware	Credits:03
CourseObjectives:			
<ul style="list-style-type: none"> • Describethesoftwaredefineddatacenter • DeployanESXihostandcreatevirtual • DescribevCenterServerarchitecture • ConfigurevirtualnetworkswithvSpherestandardswitches 			
CourseOutcomes:			
<ul style="list-style-type: none"> • InstallandconfigurevirtualizationtechnologysuchasVMware. • InstallandconfigurevirtualservercomponentsuchasvCenter • ConfigureandmanagevirtualnetworkandstoragesuchasvCenterserverorESXi.. 			
UnitI	IntroductiontoVirtualizationTechnologies		
VMwareworkstation,VMwareplayer,Virtualbox,IntroduceVirtualizationIntroduceVirtualmachines, IntroducevSpherecomponents			
UnitII	VMwareESXandESXi(ESX/ESXi4.1)		
.IntroducethearchitectureofESXandESXi,ManuallyconfigureESX/ESXi			
UnitIII	VirtualMachines		
.DeployvirtualmachinesusingtheCreateNewVirtualMachinewizard,templates,cloning,andVMwarevCenterCon verterModifyandmanagevirtualmachinesPerformStoragevMotionmigrations			
UnitIV	AccessControlANDResourceMonitoring		
.Controluseraccessthroughrolesandpermissions,ControlvirtualmachineaccesstoCPU,memory,and I/Oresources,IntroduceVMkernelmethodsforoptimizingCPUandmemoryusage,Monitorresourceusage usingvCenterServerperformancegraphsand alarms			
UnitV	Networking		
Create,configure,andmanagevNetworkstandardswitches,Create,configure,andmanagenetworkconnections,Cr eate,configure,andmanageportgroups,Backupandrecovervirtualmachinesusing VMwareDataRecovery			
UnitVI	DataProtection		
BackupandrecovervirtualmachinesusingVMwareDataRecovery			
ReferenceBooks:			
VirtualizationForDummiesPaperback–November16,2007byBernardGolden(Author)ISBN-13: 978-0470148310ISBN-10:0470148314Edition:1st			

CodeSSANE-501B	ThirdSemester	Elective VMware	Credits:01
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Note: Conduct at least 15 practicals on the given syllabus

Code-SSANE-501C	ThirdSemester	Elective Data Mining and Data Warehousing	Credits:03
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CourseObjectives:

- i. To understand the principles of Data warehousing and Data Mining.
- ii. To be familiar with the Data warehouse architecture and its Implementation.
- iii. To know the Architecture of a Data Mining system.
- iv. To understand the various Data Preprocessing Methods.
- v. To perform classification and prediction of data.

CourseOutcomes:

After successful completion of this course, students should be able to:

- Understand the usage, need and cost of Data Warehouse
- Learn various techniques for Data Warehouse and Data Mining
- Understand Market Basket Analysis

UnitI	Introduction
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Basic Data Mining task, Data Mining Vs Knowledge discovery in databases, Data mining metrics, Social Implication of Data Mining.

UnitII	Related Concepts and Data Mining Techniques
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Database/OLTP systems, Information Retrieval, Decision Support Systems, Dimensional Modelling, OLAP, Web Search Engines, Statistical perspective on Data Mining, Decision Tree, Neural networks

UnitIII	Classification
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Introduction, Statistical based algorithms, Distance based algorithms, Decision tree-based algorithms, Neural network-based algorithm.

UnitIV	Clustering and Association Rules		
Introduction, Hierarchical algorithms, Partitioned algorithms, clustering large databases, Basic algorithms, Parallel and distributed algorithms.			
UnitV	Web Mining		
Introduction, Web content mining, Web structure mining, Web usage mining			
UnitVI	Data Warehousing		
Data warehousing Components, building a Data warehouse, Data Warehouse Architecture, DBMS Schemas for Decision Support, Data Extraction, Clean-up, and Transformation Tools			
ReferenceBooks:			
<ol style="list-style-type: none"> 1. Data Mining Introductory and Advanced Topics, 2008, Margaret H.Dunham and S. Sridhar, Pearson Education, ISBN 81-7758-785-4 2. Data Warehousing Fundamentals, 2009, PaulrajPonniah, Wiley India Publication, ISBN 978-81-265-0919-5 3. Alex Berson and Stephen J. Smith “Data Warehousing, Data Mining & OLAP”, Tata McGraw – Hill Edition, Tenth Reprint 2007. 4. K.P. Soman, ShyamDiwakar and V. Ajay “Insight into Data mining Theory and Practice”, Easter Economy Edition, Prentice Hall of India, 2006. 5. G. K. Gupta “Introduction to Data Mining with Case Studies”, Easter Economy Edition, Prentice Hall of India, 2006. 6. Pang-Ning Tan, Michael Steinbach and Vipin Kumar “Introduction to Data Mining”, Pearson Education, 2007. 			
Code- SSANE- 501C	ThirdSemester	Elective Data Mining and Data Warehousing	Credits:01
Note: Conduct at least 15 practical’s on the given syllabus			

Code- SSANE -501D	ThirdSemester	Elective	Credits:03
UniversityrecognizedMOOC(NPTEL/SWAYAM/others)ORIntra/InterDepartmentalcourses			

CodeSS ANR- 551	ThirdSemester	ResearchProject	Credits:04
Students have to complete the research project			

Code SSANC- 551	FourthSemester	ExchangeServer	Credits:04 Marks:80 Hours-50
CourseObjectives:			
<ul style="list-style-type: none"> • InstallanddeployExchangeServer2010 • ConfigurethePublicfolderdatabaseinExchangeServer2010 • ManageExchangemailboxinExchangeServer2010 			
CourseOutcomes:			
After completing the course student will able to:			
<ul style="list-style-type: none"> • DeployExchangeServer2010 • ConfigureMailboxserverroles • ManagemailboxesinExchangeServer2010 • ConfiguretheDistributionGroups 			
UnitI	ExchangeDatabases		
HardwareandSoftwareRequirements,InstallingExchangeServer2010,DeployingExchangeDatabases,ConfiguringExchangeDatabases			
UnitII	AddressLists		
ManagingMailboxDatabasesandManagingPublicFolderDatabases,AddressListConfiguration,Creatingand7ConfiguringanAddressList,WorkingwithOfflineAddressBooks.			
UnitIII	ExchangeMailboxes		
Mailbox Configuration, Creating Mailboxes, Linked Mailboxes, Configuring Mailbox Properties, MovingMailboxes, Disabling, Removing, and Reconnecting, Mailboxes, Import and Export Mailboxes, ArchiveMailboxes,ResourcesandSharedMailboxes,CreatingandConfiguringResourceMailboxes,Shared Mailboxes,ConvertingMailboxes			
UnitIV	DistributionGroupsandPublicFolders		
ManagingRecipientsandDistributionGroups,MailContacts,Mail-EnabledUsers,DistributionGroups, SettingUpPublicFolders,CreatingPublicFoldersConfiguringPublicFolderPermissions,Mail-EnablePublic Folder,ConfiguringPublicFolder Limits			
UnitV	ConfiguringClientAccess&TransportServer		
ConfigurePOPandIMAP,ActiveSync,OutlookAnywhereandRPCClients,OutlookAnywhere,OWA,ExchangeControlPanel,HubTransportServers,AcceptedDomains,RemoteDomains,EmailAddress Policies,EdgeTransportServers,ManagingDatabaseAvailabilityGroups,DAGs,CreateDAGs			
UnitVI	ConfiguringTransportServers		
HubTransportServers,AcceptedDomains,RemoteDomains,EmailAddressPolicies,TransportSettingsandTransport,Dumpster,EdgeTransportServers,EdgeTransportRole			
ReferenceBooks:			
MCTSSelf-PacedTrainingKit(Exam70-662):ConfiguringMicrosoftExchangeServer2010Pro Certification(MicrosoftPublication			

Code SSANC- A552	FourthSemester	WindowsADCPart–II	Credits:04 Marks:80 Hours-50
CourseObjectives:			
<ul style="list-style-type: none"> • ConfigureandTroubleshootDomainNameSystem • MaintainActiveDirectoryDomainServices • Install,ConfigureandTroubleshootNetworkPolicyServer • ConfigureandTroubleshootRemoteAccess 			
CourseOutcomes:			
After completing the course student will be able to:			
<ul style="list-style-type: none"> • Configure Server Authentication • Configure File Services and Disk Encryption • ConfigureDNSZones • Maintain Active Directory 			
UnitI	MonitoringServers		
IntroducingtheMicrosoftManagementConsole(MMC),UsingEventViewer,UsingReliabilityMonitor,ManagingPerformance,MonitoringtheNetwork			
UnitII	ConfiguringFileServicesandDiskEncryption		
SecuringFiles,EncryptingFileswithEFS,ManagingEFSCertificatesEncryptingFileswithBitLocker,ManagingBitLockerCertificatesConfiguringtheNetworkUnlockFeature			
UnitIII	ConfiguringDNSZones		
UnderstandingDNS,ConfiguringandManagingDNSZonesUsingtheDNSSCMDCommandtoManageZones,ConfiguringDNSRecordTypesUsingtheDNSSCMDCommandtoManageResourceRecords,TroubleshootingDNSProblems			
UnitIV	ConfiguringaNetworkPolicyServer		
ConfiguringaNetworkPolicyServerInfrastructure,InstallingandConfiguringNetworkPolicyServer,ManagingNPPolicies,ConfiguringConnectionRequestPoliciesConfiguringNetworkPolicies,ManagingNPSTemplates			
UnitV	ConfiguringServerAuthentication		
ConfiguringServerAuthentication,ManagingServiceAccounts,UnderstandingDomainControllers,InstallingandConfiguringanRODC,CloningaDomainController			
UnitVI	MaintainingActiveDirectory		
AutomatingUserAccountManagement,BackingUpandRestoringActiveDirectory OptimizinganActiveDirectoryDatabase, CleaningUp Metadata			
ReferenceBooks:			
ExamRef70-411).AdministeringWindowsServer2012-ByPatrickRegan(MicrosoftOfficialacademic course			

CodeS SANCP- 551	FourthSemester	Lab7:ExchangeServer	Credits:01
Note: Conduct at least 15 practical's on the given syllabus			

CodeS SANCP- 552	FourthSemester	Lab8:WindowsADCII	Credits:01
Note: Conduct at least 15 practical's on the given syllabus			

SSANE -551A	FourthSemester	Elective IntroductiontoNextGenerationNetworks	Credits:03
CourseObjectives:			
<ul style="list-style-type: none"> • StudyofGSM/UMTS • StudyofCDMA systemsandOFDMA systems. • Managewirelessnetwork. • ConfigureWirelessnetwork 			
CourseOutcomes:			
After completing the course student will be able to:			
<ul style="list-style-type: none"> • DeployingWLAN&Wi-Fi • Configure GSM&GPRS • Configure CDMA systemsandOFDMA systems 			
UnitI	ConvergedServicesforNextGenerationNetworks		
GSM/UMTS Network protocols:SS7and 14tandardi basics, Supplementary Services:UMTS procedures.IntelligentNetwork:INprinciples,CAMEL,Services:whatarethechallenges?,Integration,deployment issues.			
UnitII	IntroductiontoNextGenerationNetworks		
IMS:theconvergence.NGNarchitecture,NGNcontrolarchitecturesandprotocols,Multi-access totheservices:3G,WiFi,DSL,Cable.TISPAN,SIP,Servicearchitectures,Transitionofnetworks(PSTN,IP-based)toNGN			
UnitIII	WirelessAccessandTransportTechnologies		
RANarchitecture:RadioAccessNetworkArchitectureforGSM,GPRSandUMTS,networkdevices,interfacesand protocols,QoSdefinitionandmanagementinGPRSandUMTS,Accessmethodsand radioresource managementinmobilenetworks,mainlyfor:TDMAsystems			
UnitIV	CDMA systemsandOFDMA systems		
SchedulingissuesforGPRS,UMTSandWiMAX:downlink,uplinkPhysicalto logicalchannelmapping:forGSM,for UMTSPcedureandprotocolusedforresourceallocation,PDPContextandTBF allocation			
UnitV	WPAN,WLAN,WMANandBroadcasttechnologies		
WLAN,WPAN,WMAN,WiFi:WiMAX,DVB-H:Usageandstandard,Security:Basics,architectures, algorithms,Bluetooth:Standard,performance,usageandapplications,Zigbee			
UnitVI	Security		
UWB:Standardsandusage,Service discoveryinwirelessNetworks(jxta,UPnP,SecurityinWireless Networks:PANs,LANsandcellularWirelessNetworksSimulation(toolsandmethods)			
ReferenceBooks:			
NextGenerationNetworkServices:Technologies&StrategiesbyNeillWilkinson,Publication,Edition1			

Code SSANE -551 A	FourthSemester	Elective IntroductiontoNextGenerationNetworks	Credits:01
Note: Conduct at least 15 practical's on the given syllabus			

Code SSANE -551B	FourthSemester	ElectiveDistri butedSystem	Credits:03
CourseObjectives:			
<ul style="list-style-type: none"> • Introducedistributedcomputingenvironment. • Emphasizeondesigntechniquesandconstraintsofdistributedcomputingenvironment • Emphasizeonanalysisofdistributedcomputingenvironment 			
CourseOutcomes:			
<ul style="list-style-type: none"> • Distinguishbetweendistributedcomputingandparallelcomputing. • UnderstandconceptsofarchitecturalStyles,Communication,andSynchronization. • Demonstratedifferentnaming&synchronizationtechnologies • Explorevariousdistributedconcepts 			
UnitI	Introduction&Architectures		
Definitionofdistributedsystem,Goals,TypesofDistributedsystems,Architecturalstyles			
UnitII	SystemArchitectures		
CentralizedArchitectures,DecentralizedArchitectures,HybridArchitectures,ArchitecturesVersusMiddleware·Self-Managementin Distributedsystems			
UnitIII	Processes		
Threads·Virtualization·Clients·Servers·CodeMigration			
UnitIV	Communication		
Fundamentals·RemoteProcedureCall·Messageorientedcommunication·Streamorientedcommunication·Multicastcommunication			
UnitV	NamingSystem		
Names,Identifiers,andAddresses·FlatNaming·StructuredNaming·Attribute-BasedNaming			
UnitVI	Synchronization		
Clocksynchronization:Physicalclocks,Globalpositioningsystem,ClocksynchronizationAlgorithms·LogicalClocks·MutualExclusion:CentralizedAlgorithm,ADecentralizedAlgorithm,ADistributedAlgorithm,ATokenRingAlgorithm.·GlobalPositioningofNodes·ElectionAlgorithms			
ReferenceBooks:			
DistributedsystemsprinciplesandPargadigms,SecondEdition-byAndrewS.Tanenbaum,MaartenVanSteen			

Code SSANE -551B	FourthSemester	ElectiveDistri butedSystem	Credits:01
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Note: Conduct at least 15 practical's on the given syllabus

Code- SSANE- 551 C	FourthSemester	ElectiveInternet of Things (IoT)	Credits:03
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CourseObjectives:

- i. To study the fundamentals about IoT
- ii. To study about IoT Access technologies
- iii. To study the design methodology and different IoT hardware platforms.
- iv. To study the basics of IoT supporting services.
- v. To study about various IoT case studies and industrial applications.

CourseOutcomes:

After successful completion of this course, students should be able to:

- Understand the basics of IoT.
- Implement the state of the Architecture of an IoT.
- Understand design methodology and hardware platforms involved in IoT.
- Explore IoT Sensors, Actuators and Microcontroller devices

UnitI Basics of IoT Networking

Overview of Internet of Things, Wireless Sensor Networks, Machine-to-Machine Communications Cyber Physical Systems

UnitII Introduction to Internet of Things

Evolution of IoT, Enabling IoT and the Complex Interdependence of Technologies, IoT Networking Components, Addressing Strategies in IoT

UnitIII IoT Sensors, Actuators and Microcontroller devices

Sensors, Sensor Characteristics, Sensing Types, Actuators, Actuator Characteristics, Actuator Types Arduino, Raspberry Pi

UnitIV Processing in IoT

Data Format, Importance of Processing in IoT, Processing Topologies, IoT Device Design and Selection Considerations

UnitV IoT Connectivity Technologies

IEEE 802.15.4, Zigbee, RFID, DASH7, NFC, Z-Wave, Cloud Computing, Virtualization, Cloud Models
Sensor-Cloud: Sensors-as-a-Service, Fog Computing and Its Applications

UnitVI Application Areas and Futures of IoT

Agricultural IoT, Components of an agricultural IoT, Advantages of IoT in agriculture, Smart irrigation management system, Vehicular IoT, Components of vehicular IoT, Advantages of vehicular IoT, Healthcare IoT, Components of healthcare IoT, Advantages and risk of healthcare IoT, Evolution of New IoT Paradigms, Challenges Associated with IoT, Emerging Pillars of IoT

References:

1. Introduction to IoT by SudipMisra, Anandarup Mukherjee, Arijit Roy | Publication Cambridge University Press | ISBN 9781108842952, ISBN 9781108959742.
2. The Internet of things_ do-it-yourself projects with Arduino, Raspberry Pi, and BeagleBone Black | ISBN: 978-0-07-183521-3
3. The Internet of Things – Key applications and Protocols, Olivier Hersent, David Boswarthick Omar Elloumi and Wiley, 2012.| ISBN 978-1-11999435-0

Code- SSANE- 551 C	FourthSemest er	Elective Internet of Things (IoT)	Credits:01
Note: Conduct at least 15 practical's on the given syllabus			

Code- SSANE- 551D	FourthSe mester	Elective	Credits:03
UniversityrecognizedMOOC(NPTEL/SWAYAM/others)ORIntra/InterDepartmentalcourses			

CodeSS ANR- 552	FourthSemester	ResearchProject	Credits:06
Student Have to Complete the Research project			