।। सा विद्या या विमुक्तये ।।
स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड
"ज्ञानतीर्थ" परिसर, विष्णुपूरी, नांदेड - ४३१६०६ (महाराष्ट्र)
SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY NANDED
"Dnyanteerth", Vishnupuri, Nanded - 431606 Maharashtra State (INDIA)
Established on 17th September 1994 – Recognized by the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'A' Grade
ACADEMIC (1-BOARD OF STUDIES) SECTION
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संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदव्युत्तर स्तरावरील द्वितीय वर्षाचे **CBCS Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२०–२१ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, **दिनांक २० जून २०२० रोजी संपन्न झालेल्या ४७व्या मा. विद्या परिषद बैठकीतील विषय क्र.११/४७–२०२०**च्या ठरावानुसार प्रस्तुत विद्यापीठाच्या **संलग्नित महाविद्यालयांतील विज्ञान व तंत्रज्ञान विद्याशाखेतील पदव्युत्तर स्तरावरील द्वितीय वर्षाचे** खालील विषयांचे **C.B.C.S. (Choice Based Credit System) Pattern** नुसारचे अभ्यासक्रम शैक्षणिक वर्ष २०२०–२१ पासून लागू करण्यात येत आहेत.

1. M.Sc.-II Year-Botany
2. M.Sc.-II Year-Herbal Medicine
3. M.Sc.-II Year-Analytical Chemistry
4. M.Sc.-II Year-Biochemistry
5. M.Sc.-II Year-Organic Chemistry
6. M.Sc.-II Year-Physical Chemistry
7. M.Sc.-II Year-Computer Management
8. M.Sc.-II Year-Computer Science
9. M.Sc.-II Year-Information Technology
10. M.C.A. (Master of Computer Applications)-II Year
11. M.Sc.-II Year-Software Engineering
12. M.Sc.-II Year-System Administration & Networking
13. M.Sc.-II Year-Dairy Science
14. M.Sc.-II Year-Environmental Science
15. M.Sc.-II Year-Applied Mathematics
16. M.Sc.-II Year-Mathematics
17. M.Sc.-II Year-Microbiology
18. M.Sc.-II Year-Physics
19. M.Sc.-II Year-Zoology
20. M.Sc.-II Year-Biotechnology
21. M.Sc.-II Year-Bioinformatics

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

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.: शैक्षणिक–१/परिपत्रक/पदव्युत्तर–सीबीसीएस अभ्यासक्रम/२०२०–२१/**३३५**

दिनांक : १६.०७.२०२०.

स्वाक्षरित/–
उपकुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत माहिती व पुढील कार्यवाहीस्तव :
१) मा. कुलसचिव यांचे कार्यालय, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
३) प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) साहाय्यक कुलसचिव, पदव्युत्तर विभाग, प्रस्तुत विद्यापीठ.
५) उपकुलसचिव, पात्रता विभाग, प्रस्तुत विद्यापीठ.
६) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ.

Swami Ramanand Teerth Marathwada University, Nanded

(NAAC Re-accredited with 'A' Grade)

Syllabus of

Second Year M.Sc. (System Administration and Networking)*
(Revised CBCS pattern)
Introduced from Academic Year 2020-2021

*(BoS deserves the rights for minor corrections, typographical errors in this syllabus with due approval of Administrations)

M.Sc. System Administration and Networking

M.Sc. System Administration and Networking (2years) program / degree is a specialized program in system administration and network related issues. It builds the student on higher studies and research awareness in system administration, maintenance and networking so as to become competent in the current race and development of new computational sciences. The duration of the study is of four semesters, which is normally completed in two years.

CBCS pattern

The M.Sc. System Administration and Networking program as per CBCS (Choice based credit system) pattern, in which choices are given to the students under open electives and subject electives. The students can choose open electives from the wide range of options to them.

Eligibility and Fees

The eligibility of a candidate to take admission to **M.Sc. System Administration and Networking** program is as per the eligibility criteria fixed by the University. More details on admission procedure and fee structure can be seen from the prospectus of the college / institution as well as on website of the University.

Credit Pattern

Every course has corresponding grades marked in the syllabus structure. There are 25 credits per semester. A total of 100 credits are essential to complete this program successfully. The Grading pattern to evaluate the performance of a student is as per the University rules.

Every semester has a combination of Theory (core or elective) courses and Lab courses. Each theory course has 04 credits which are split as 02 external credits and 02 internal credits. The university shall conduct the end semester examination for 02 external credits. For theory internal credit, student has to appear for 02 class test (15 marks) and 01 assignment (20 marks). Every lab course has 02 credits which are split as 01 external credit and 01 internal credit. For lab internal credit, the student has to submit Laboratory Book (05 marks) and remaining 20 marks are for the Lab activities carried out by the student throughout the semester. For lab external credit, 20 marks are reserved for the examinational experiment and 05 marks are for the oral / viva examinations. There is a special skill based activity of 01 internal credits per semester which shall inculcate awareness regarding the domain of computers, IT, and ICT.

The open elective has 04 credits which are purely internal. If students are opting for MOOCs as open elective, then, there must be a Faculty designed as MOOCs course coordinator who shall supervise learning through MOOCS. This is intentionally needed as the MOOCs course coordinator shall verify the MOOC details including its duration, staring date, ending date, syllabus contents, mode of conduction, infrastructure feasibility, and financial feasibility during start of each semester. This is precautionary as the offering of the MOOCs through online platforms are time specific and there must be proper synchronization of semester duration with the MOOCs duration. Students must opt for either institutional / college level open elective or a course from University recognized MOOCs platforms as open electives.

The number of hours needed for completion of theory and practical courses as well as the passing rules, grading patterns, question paper pattern, number of students in practical batches, etc shall be as per the recommendations, norms, guidelines and policies of the UGC, State Government and the SRTM University currently operational. The course structure is supplemented with split up in units and minimum numbers of hours needed for completion of the course, wherever possible.

Under the CBCS pattern, students would graduate **M.Sc. System Administration and Networking** with a minimum number of required credits which includes compulsory credits from core courses, open electives and program specific elective course. All students have to undergo lab / practical activities leading to specific credits and project development activity as a part of professional UG program.

1. **M.Sc. System Administration and Networking** Degree / program would be of 100 Credits. Total credits per semester= 25
2. Each semester shall consist of three core courses, one elective course, one open elective course and two practical courses. Four theory courses (core+elective) = 16 Credits. Two practical / Lab courses= 4 Credits in total (02 credits each) , One Open elective= 4 credit, One skill enhancement activity of 01 credits.
3. One Credit = 25 marks , Two Credits = 50 Marks, Four Credits = 100 Marks

PEO, PO and CO Mappings

1. **Program Name** : MSc.(SAN)

2. **Program Educational Objectives**: After completion of this program, the graduates / students would

PEO I :Technical Expertise	Implement fundamental domain knowledge of core courses for developing effective computing solutions by incorporating creativity and logical reasoning.
PEO II : Successful Career	Deliver professional services with updated technologies in System Administration and NEtworking based career.
PEO III :Hands on Technology and Professional experience	Develop leadership skills and incorporate ethics, team work with effective communication & time management in the profession.
PEO IV :Interdisciplinary and Life Long Learning	Undergo higher studies, certifications and research programs as per market needs.

3. **Program Outcome(s):** Students / graduates will be able to

PO1: Apply knowledge of mathematics, science and algorithm in solving Computer problems.
PO2: Generate solutions by understanding underlying computational environment for administration and maintenance
PO3: Design component, or processes to meet the needs within realistic constraints.
PO4: Identify, formulate, and solve problems using computational temperaments.
PO5: Comprehend professional and ethical responsibility in computing profession.
PO6: Express effective communication skills.
PO7: Recognize the need for interdisciplinary, and an ability to engage in life-long learning.
PO8: Actual hands on technology to understand it's working.
PO9: Knowledge of contemporary issues and emerging developments in computing profession.
PO10: Utilize the techniques, skills and modern tools, for actual development process
PO11: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings in actual development work
PO12: Research insights and conduct research in computing environment.

4. **Course Outcome(s):** Every individual course under this program has course objectives and course outcomes (CO). The course objectives rationally match with program educational objectives. The mapping of PEO, PO and CO is as illustrated below

5. **Mapping of PEO& PO and CO**

Program Educational Objectives	Thrust Area	**Program Outcome**	Course Outcome
PEO I	Technical Expertise	PO1,PO2,PO3,PO6	All core courses
PEO II	Successful Career	PO4,PO5,PO11,	All discipline specific electives courses
PEO III	Hands on Technology and Professional experience	PO8,PO10	All Lab courses
PEO IV	Interdisciplinary and Life Long Learning	PO7,PO9,PO12	All open electives and discipline specific electives

Swami Ramanand Teerth Marathwada University Nanded

CBCS Revised Syllabus w.e.f:2020-21

Program: SY -M.Sc. (System Administration & Networking) – Affiliated Colleges

Sr.No	Course Category	Course Code	Course Title	Internal Credit	External Credit	Total Credits
1	Core Subject	SAN-301	Cloud Computing	1	3	4
2		SAN-302	Network Administration (Switching)	1	3	4
3		SAN-303	Windows ADC Part –I	1	3	4
Choose any one from the below Elective courses						
4	Elective Subject	SAN-304 A	Windows Operating Systems	1	3	4
5		SAN-304 B	VM Ware			
Practical/Lab						
6	Lab	SAN-305	Lab 5: Network Administration (Switching)	1	1	2
7		SAN-306	Lab 6: Windows ADC Part –I	1	1	2
8	Open Elective	SAN-307 A	University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses	4	0	4
9		SAN-307 B	Logical Reasoning			
10	Skill Based Activity	SK-308	SK-03: Seminar Presentation Activity	1	0	1
					Total	**25**

Sr.No	Course Category	Course Code	Course Title	Internal Credit	External Credit	Total Credits
1	Core Subject	SAN-401	Exchange Server	1	3	4
2		SAN-402	Windows ADC Part – II	1	3	4
3		SAN-403	Major Project Development Activity	0	4	4
Choose any one from the below Elective courses						
4	Elective Subject	SAN-404 A	Introduction to Next Generation Networks	1	3	4
5		SAN-404 B	Distributed System			
Practical/Lab						
6	Lab	SAN-405	Lab 7: Exchange Server	1	1	2
7		SAN-406	Lab 8 :Windows ADC Part – II	1	1	2
8	Open Elective	SAN-407 A	University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses	4	0	4
9		SAN-407 B	Numerical Aptitude			
10	Skill Based Activity	SK-408	SK-04 : Soft Skills	1	0	1
					Total	**25**

Code SAN-301	Third Semester	**Cloud Computing**	Credits:04

Course Objectives:

- To Study basics of cloud computing, and comprehend the terminology, tools and technologies associated with today's top cloud platforms.
- To provide the programmer's perspective of working of Cloud Computing.
- Implement Simple Cloud programs to solve simple problem.

Course Outcomes:

- Awareness of existing demanding trends for Clouds and Virtualizations in the IT industry in order to get placement as well as in research

Unit I	**Introduction**

Introduction, Mainframe architecture, Client-server architecture, 3-tier architectures with TP monitors, Internet technology and web-enabled applications, Web application servers, Internet of services

Unit II	**Software as a service and cloud computing**

Emergence of software as a service, Successful SaaS architectures, Dev 2.0 platforms, Cloud computing, Dev 2.0 in the cloud for enterprises, Infrastructure as a service: Amazon EC2, Platform as a service: Google App Engine, Microsoft Azure

Unit III	**Data in the cloud**

Relational databases, Cloud file systems: GFS and HDFS, Big Table, HBase and Dynamo, Cloud data stores: Data store and Simple DB

Unit IV	**Dev 2.0 platforms**

Salesforce.com's Force.com platform,TCS Instant Apps on Amazon cloud ,More Dev 2.0 platforms and related efforts , Advantages, applicability and limits of Dev 2.0

Unit V	**Web services, AJAX and mashups**

Web services: SOAP and REST, SOAP versus REST, AJAX: asynchronous 'rich' interfaces, Mashups: user interface services

Unit VI	**MapReduce and extensions**

Parallel computing, The MapReduce model, Parallel efficiency of MapReduce, Relational operations using MapReduce, Enterprise batch processing using MapReduce

Reference Books:

Enterprise Cloud Computing: Technology, Architecture, Application ByGautam Shroff

Code SAN-302	Third Semester	**Network Administration (Switching)**	Credits:04

Course Objectives:

- Describe the role of Virtual Trucking Protocol and place these protocols in the context of modern network design
- Understand trucking protocols like IEEE 802.1Q and ISL according to industry requirement
- Brief understanding of VLANs & Trunks & CISCO Switches.

Course Outcomes:

- Inter VLAN routine will help to establish End to End communication between devices.
- Best Practices for configuring IP Subnet & VLAN protocols
- Best Practices for configuring NAT & ACL

Unit I	**LAN Switching**

LAN Switching Concepts, Historical Progression. Hubs, Bridges, and Switches , Switching Logic, Accessing the Cisco Catalyst 2960 Switch CLI , Cisco Catalyst Switches and the 2960 Switch , Switch Status from LEDs , Accessing the Cisco IOS CLI , CLI Access from the Console , Accessing the CLI with Telnet and SSH , Password Security for CLI Access

Unit II	**Virtual LANs**

Virtual LAN Concepts, Trucking with ISL and 802.1Q, IP Subnets and VLANs, VLAN Trucking Protocol (VTP), VLAN and VLAN Trucking Configuration and Verification, VTP Configuration and Verification.

Unit III	**Infrastructure Services**

Configure and verify DHCP on a router, Configure, verify, and troubleshoot inside source NAT, Static NAT Configuring and Verification, Dynamic NAT Configuring and Verification, PAT Configuring and Verification, BGP protocol configuration & verification.

Unit IV	**IP Version 6**

Global Unicast Addressing, Routing, and Subnetting, IPv6 Protocols and Addressing, Configuring IPv6 Routing and Routing Protocols, IPv6 Transition Options

Unit V	**Infrastructure Security**

Configure, verify, and troubleshoot port security, Configure, verify, and troubleshoot IPv4 and IPv6 access list for traffic filtering – Standard ACL, Extended ACL, Configure, verify, and troubleshoot basic device -Local authentication, Secure password, Access to device Source address, Telnet/SSH

Unit VI	**Virtual Private Networks**

VPN Fundamentals, IPsec VPNs, SSL VPNs, Types of VPN

Reference Books:

CCENT/CCNA ICND1 (Second Edition) - Wendell Odom

Code SAN-303	Third Semester	**Windows ADC Part –I**	Credits:04

Course Objectives:

- Configure and Troubleshoot Domain Name System
- Maintain Active Directory Domain Services
- Manage User and Service Accounts
- Implement Group Policy Infrastructure

Course Outcomes:

- Best Practices for domain configuration
- Best Practices for group policy.

Unit I	**Installing and configuring servers**

Install servers, Configure servers, Configure local storage (Emphasis on windows server 2012)

Unit II	**Configuring server roles and features**

Configure file and share access, Configure print and document services, Configure servers for remote management

Unit III	**Configuring Hyper-V**

.Create and configure virtual machine settings Create and configure virtual machine storage, Create and configure virtual networks

Unit IV	**Deploying and configuring core network services**

Configure IPv4 and IPv6 addressing, Configure servers, Deploy and configure the DNS service

Unit V	**Installing and administering Active Directory**

Install domain controllers, Create and manage Active Directory users, Create and manage Active Directory groups

Unit VI	**Creating and managing Group Policy**

Create Group Policy Objects, Configure security policies, Configure application restriction policies, Configure Windows Firewall

Reference Books:

MCTS Self-Paced Training Kit (Exam 70-410): Installing and Configuring Windows Server 2012

Code SAN 304 A	Third Semester	**Elective** **Windows Operating Systems**	Credits:04

Course Objectives:

- Configure and manage the Windows 7 desktop
- Windows 7 remote capabilities and utilities
- How to use Windows Firewall with advanced features and network profiles
- Evolution of the Windows Desktop Operating System
- Configure and use the User account control in various network profiles

Course Outcomes:

- Monitor and troubleshoot Windows 7 computers for problems with the operating system, hardware, network security, and applications
- Best practice to Configure Bit-locker.
- You can configure application software policy.

Unit I	**Introduction**

Windows Operating system, History of Windows OS, Advantages of Windows 7 & Windows 8, Hardware Requirement, Installation Steps for Windows 7, Installation Steps for Windows8

Unit II	**Configuring and Deploying System Images**

Capturing System Images, Managing Virtual Hard Disk Files, Managing a System Image Before Deployment, Deploying Images.

Unit III	**Managing Devices**

.Managing Device Drivers and Devices, Managing Disks, Application Compatibility, Managing App Locker and Software, Configuring IPv4, Configuring IPv6, Network Configuration.

Unit IV	**Windows Services**

Managing Windows Firewall, Sharing Resources, Folder and File Access, Managing BitLocker, Managing User Account Control, Windows 7 Authentication and Authorization.

Unit V	**Windows Tools**

Managing DirectAccess, Remote Connections, Windows 7 Mobility, Updating Windows 7, Configuring Internet Explorer

Unit VI	**Monitoring & Backup**

Windows 7 Mobility, Updating Windows 7, Configuring Internet Explorer, Monitoring Systems, Configuring Performance Settings. Backup, System Recover, Recovering Files and Folders.

Reference Books:

MCTS 70-680 Configuring-Windows-7 Training Kit – Microsoft Publication

Code SAN 304 B	Third Semester	**Elective VMware**	Credits:04

Course Objectives:

- Describe the software defined data center
- Deploy an ESXihost and create virtual
- Describe vCenter Server architecture
- Configure virtual networks with vSphere standard switches

Course Outcomes:

- Install and configure virtualization technology such as VMware.
- Install and configure virtual server components such as vCenter
- Configure and manage virtual network and storage such as vCenter server or ESxi..

Unit I	**Introduction to Virtualization Technologies**

VMware workstation, VMware player, Virtual box, Introduce Virtualization Introduce Virtual machines, Introduce vSphere components

Unit II	**VMware ESX and ESXi (ESX/ESXi 4.1)**

.Introduce the architecture of ESX and ESXi, Manually configure ESX/ESXi

Unit III	**Virtual Machines**

.Deploy virtual machines using the Create New Virtual Machine wizard, templates, cloning, and VMware vCenter Converter Modify and manage virtual machines Perform Storage vMotion migrations

Unit IV	**Access Control AND Resource Monitoring**

.Control user access through roles and permissions, Control virtual machine access to CPU, memory, and I/O resources, Introduce VMkernel methods for optimizing CPU and memory usage, Monitor resource usage using vCenter Server performance graphs and alarms

Unit V	**Networking**

Create, configure, and manage vNetwork standard switches, Create, configure, and manage network connections, Create, configure, and manage port groups, Back up and recover virtual machines using VMware Data Recovery

Unit VI	**Data Protection**

Back up and recover virtual machines using VMware Data Recovery

Reference Books:

Virtualization For Dummies Paperback – November 16, 2007 by Bernard Golden (Author) ISBN-13: 978-0470148310 ISBN-10: 0470148314 Edition: 1 st

Code SAN 305	Third Semester	**Network Administration (Switching)**	Credits:02

Practical List:

1. Study of virtual LAN.
2. Study of VLAN Trucking.
3. Study of VTP protocol configuration.
4. Study of Static NAT.
5. Study of Dynamic NAT.
6. Study of PAT NAT.
7. Study of Standard ACL.
8. Study of Extended ACL

Code SAN 306	Third Semester	**Windows ADC Part –I**	Credits:02

Practical List:

1. Installation of windows server 2012
2. Installation of domain controllers.
3. Creating ADDS
4. Creating users
5. Creating Computers
6. Creating groups
7. Study of windows firewall.
8. Study of Group Policy

Code-SAN 307 A	Third Semester	**Open Elective**	Credits:04
University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses			

OR

Code-SAN 307 B **Elective**	Third Semester	**Open Elective** **Logical Reasoning**	Credits:04

Course Objectives:

- This course enables students to develop their ability to reason by introducing them to elements of reasoning
- Basics knowledge of different types of Series
- Study of Coding and Decoding
- Knowledge of Blood Relations, Directions and Puzles

Course Outcomes:

- Develops ability to think logically of student
- Understanding Relations, Directions, Arrangements, Logics, Puzzles.
- Improves Mental Alertness
- Construct a logically sound and well-reasoned argument.

Unit I	**Series, Analogy and Classification Lectures series, Examples on continues pattern series.**

A.Series: Types of series, Alphabet series, Alpha numeric
B. Analogy: Completing the Analogous Pair, Direct/Simple Analogy, Choosing the Analogous Pair, Double Analogy, Number analogy, Alphabet analogy, Correlation between letters/numbers.
C .Classification: Choosing the odd word, Choosing the odd numeral, Choosing the odd letter group

Unit II	**Coding-Decoding Lecturers**

A. Coding-Decoding: Letter coding, Direct Letter Coding, Number/Symbol Coding.
B .Substitution: Concept of substitution, Problem solving by using substitution
C. Deciphering: Deciphering messages word codes, Deciphering numbers/symbol codes for messages.

Unit III	**Blood Relation Lectures**

A. Introduction to relations
B. Concepts of deciphering relations based problems
C.Problems on deciphering jumbled up descriptions
D. Relation puzzle
E. Coded relations.

Unit IV	**Seating or Placing Arrangement Lectures**

A. Problems based on linear and circular based arrangement

Unit V	**Direction Sense Test Lectures**

A. Introduction B. Problems based on angular changes in direction C. Problems on Shadows D. General Problems based on Pythagoras Theorem	
Unit VI	**Syllogism and Data Sufficiency Lectures**
A.Syllogism: Introduction of logic, Rules of syllogism, Two statement problem, Three statement problem **B. Data Sufficiency:** Problems of Data sufficiency based on all Chapters.	
Reference Books:	

Sr. no.	**Name of the book**	**Author**	**Publication**
1.	A Modern Approach to Verbal & NonVerbal Reasoning	Dr.R.S Aggarwal	S.Chand andCompany
2.	Test of Reasoning	Edgar Thorpe	McGraw Hill Education
3.	www.practiceaptitudetests.com		
4.	www.allindiaexams.in		

Code SAN-308	Third Semester	**Skill Based Activity** **SK-03 : Seminar Presentation Activity**	Credits:01
		Every student must deliver a seminar on latest trends in the area. Two copies of the seminar report must be submitted to the college	

Code SAN-401	Fourth Semester	**Exchange Server**	Credits:04

Course Objectives:

- Install and deploy Exchange Server 2010
- Configure the Public folder database in Exchange Server 2010
- Manage Exchange mailbox in Exchange Server 2010

Course Outcomes:

- Deploying Exchange Server 2010
- Best practice to Configure Mailbox server roles
- Best practice to Manage mailboxes in Exchange Server 2010
- Best practice to configure the Distribution Groups

Unit I	**Exchange Databases**

Hardware and Software Requirements, Installing Exchange Server 2010, Deploying Exchange Databases, Configuring Exchange Databases

Unit II	**Address Lists**

Managing Mailbox Databases and Managing Public Folder Databases, Address List Configuration, Creating and 7Configuring an Address List, Working with Offline Address Books.

Unit III	**Exchange Mailboxes**

Mailbox Configuration, Creating Mailboxes, Linked Mailboxes, Configuring Mailbox Properties, Moving Mailboxes, Disabling, Removing, and Reconnecting, Mailboxes, Import and Export Mailboxes, Archive Mailboxes, Resources and Shared Mailboxes, Creating and Configuring Resource Mailboxes, Shared Mailboxes, Converting Mailboxes

Unit IV	**Distribution Groups and Public Folders**

Managing Recipients and Distribution Groups, Mail Contacts, Mail-Enabled Users, Distribution Groups, Setting Up Public Folders, Creating Public Folders Configuring Public Folder Permissions, Mail-Enable Public Folder, Configuring Public Folder Limits

Unit V	**Configuring Client Access & Transport Server**

Configure POP and IMAP, ActiveSync, Outlook Anywhere and RPC Clients, Outlook Anywhere, OWA, Exchange Control Panel, Hub Transport Servers, Accepted Domains, Remote Domains, Email Address Policies, Edge Transport Servers, Managing Database Availability Groups, DAGs, Create DAGs

Unit VI	**Configuring Transport Servers**

Hub Transport Servers, Accepted Domains, Remote Domains, Email Address Policies, Transport Settings and Transport, Dumpster, Edge Transport Servers, Edge Transport Role

Reference Books:

MCTS Self-Paced Training Kit (Exam 70-662): Configuring Microsoft Exchange Server 2010 Pro Certification (Microsoft Publication

Code SAN-402	Fourth Semester	**Windows ADC Part – II**	Credits:04

Course Objectives:

- Configure and Troubleshoot Domain Name System
- Maintain Active Directory Domain Services
- Install, Configure and Troubleshoot Network Policy Server
- Configure and Troubleshoot Remote Access

Course Outcomes:

- Client and Server architecture that provide request and response
- New Server Manager: Create, Manage Server Groups
- Expanded PowerShell Capabilities

Unit I	**Monitoring Servers**

Introducing the Microsoft Management Console (MMC), Using Event Viewer, Using Reliability Monitor, Managing Performance, Monitoring the Network

Unit II	**Configuring File Services and Disk Encryption**

Securing Files, Encrypting Files with EFS, Managing EFS Certificates Encrypting Files with BitLocker, Managing BitLocker Certificates Configuring the Network Unlock Feature

Unit III	**Configuring DNS Zones**

Understanding DNS, Configuring and Managing DNS Zones Using the DNS CMD Command to Manage Zones, Configuring DNS Record Types Using the DNS CMD Command to Manage Resource Records, Troubleshooting DNS Problems

Unit IV	**Configuring a Network Policy Server**

Configuring a Network Policy Server Infrastructure, Installing and Configuring Network Policy Server, Managing NPS Policies, Configuring Connection Request Policies Configuring Network Policies, Managing NPS Templates

Unit V	**Configuring Server Authentication**

Configuring Server Authentication, Managing Service Accounts, Understanding Domain Controllers, Installing and Configuring an RODC,Cloning a Domain Controller

Unit VI	**Maintaining Active Directory**

Automating User Account Management, Backing Up and Restoring Active Directory Optimizing an Active Directory Database, Cleaning Up Metadata

Reference Books:

Exam Ref 70-411). Administering Windows Server 2012- By Patrick Regan (Microsoft Official academic course

Code SAN 403	Fourth Semester	**Major Project Development Activity**	Credits:04

Course Objectives:

Understanding Project planning and workout. To provide a postgraduate level knowledge in computer science, including understanding, analysis, management, and handling of real-life information technology problems in workplace. Emphasis must be given on real life problems / Industry Requirements / Hackathon / Central Govt – State Govt Projects

Course Outcome:

Project based learning will increase their capacity and learning through shared cognition. Students will have an ability to identify, formulate and implement computing solutions. Students will be able to design a system, component or process as per needs and specification.

Guidelines for Project Development:

1. A group of maximum three students should be formed at the beginning of the semester
2. Each project will be allotted one project guide.
3. Students must submit the project topic and synopsis to the project guide.
4. Students will be given a project approval letter signed by the head of department and the project guide.
5. After receiving a project approval letter, students must submit at least three progress reports of their development in project to the guide, one per month.
6. After completion of project students have to give pre-exam demo to his guide.
7. After finalization of the project, students must prepare minimum 03 copies of the project reports, out of which one copy is for the college and one copy is for the university records. University/College copy must be bind with black covering with golden embossment and it should contain
   i. First Page
   ii. Certificate
   iii. Declaration
   iv. Acknowledgement
   v. Project Approval letter
   vi. Three Progress reports
   vii. System Flow Diagram/DFD
   viii. Chapter wise briefing, results, conclusions, snapshots, code, etc
   ix. Bibliography

Code SAN 404 A	Fourth Semester	**Elective** **Introduction to Next Generation Networks**	Credits:04

Course Objectives:

- Study of GSM/UMTS
- Study of CDMA systems and OFDMA systems.
- Manage wireless network.
- Configure Wireless network

Course Outcomes:

- Deploying WLAN & Wi-Fi
- To understand the GSM & GPRS

Unit I	**Converged Services for Next Generation Networks**

GSM/UMTS Network protocols: SS7 and 14tandardi basics, Supplementary Services: UMTS procedures. Intelligent Network: IN principles, CAMEL, Services: what are the challenges? , Integration, deployment issues.

Unit II	**Introduction to Next Generation Networks**

IMS: the convergence. NGN architecture, NGN control architectures and protocols, Multi-access to the services: 3G, WiFi, DSL, Cable. TISPAN, SIP, Service architectures, Transition of networks (PSTN, IP-based) to NGN

Unit III	**Wireless Access and Transport Technologies**

RAN architecture : Radio Access Network Architecture for GSM, GPRS and UMTS, network devices, interfaces and protocols , QoS definition and management in GPRS and UMTS, Access methods and radio resource management in mobile networks, mainly for: TDMA systems

Unit IV	**CDMA systems and OFDMA systems**

Scheduling issues for GPRS, UMTS and WiMAX: downlink, uplink Physical to logical channel mapping: for GSM, for UMTS Procedure and protocol used for resource allocation ,PDP Context and TBF allocation

Unit V	**WPAN, WLAN, WMAN and Broadcast technologies**

WLAN, WPAN, WMAN, WiFi: WiMAX, DVB-H:Usage and standard, Security :Basics, architectures, algorithms, Bluetooth: Standard, performance, usage and applications , Zigbee

Unit VI	**Security**

UWB: Standards and usage, Service discovery in wireless Networks (jxta, UPnP, Security in Wireless Networks: PANs, LANs and cellular Wireless Networks Simulation (tools and methods)

Reference Books:

Next Generation Network Services: Technologies & Strategies by Neill Wilkinson, Publication, Edition 1

Code SAN 404 B	Fourth Semester	**Elective Distributed System**	Credits:04

Course Objectives:

- Introduce distributed computing environment.
- Emphasize on design techniques and constraints of distributed computing environment
- Emphasize on analysis of distributed computing environment

Course Outcomes:

- Distinguish between distributed computing and parallel computing.
- Understand concepts of architectural Styles, Communication, and Synchronization.
- Demonstrate different naming & synchronization technologies
- Explore various distributed concepts

Unit I	**Introduction & Architectures**

Definition of distributed system, Goals, Types of Distributed systems, Architectural styles

Unit II	**System Architectures**

Centralized Architectures, Decentralized Architectures, Hybrid Architectures, Architectures Versus Middleware · Self-Management in Distributed systems

Unit III	**Processes**

Threads · Virtualization · Clients · Servers · Code Migration

Unit IV	**Communication**

Fundamentals · Remote Procedure Call · Message oriented communication · Stream oriented communication · Multicast communication

Unit V	**Naming System**

Names, Identifiers, and Addresses · Flat Naming · Structured Naming · Attribute-Based Naming

Unit VI	**Synchronization**

Clock synchronization: Physical clocks, Global positioning system, Clock synchronization Algorithms · Logical Clocks · Mutual Exclusion: Centralized Algorithm, A Decentralized Algorithm, A Distributed Algorithm, A Token Ring Algorithm. · Global Positioning of Nodes · Election Algorithms

Reference Books:

Distributed systems principles and Pargadigms, Second Edition- by Andrew S.Tanenbaum, Maarten Van Steen

Code SAN 405	Fourth Semester	**Lab 7: Exchange Server**	Credits:02

Practical List:

1. Installation of Exchange Server.
2. Deploying & configuring Exchange Databases.
3. Creating and Configuring an Address List
4. Creating public folder.
5. Creating Distribution Groups
6. Creating Mailboxes
7. Creating Link mailbox
8. Creating Resource mailbox.
9. Creating & configure accepted domain.
10. Configure E-mail Address policy.
11. Create DAG.
12. Study of Hub transport role.

Code SAN 406	Fourth Semester	**Lab 8 : Windows ADC II**	Credits:02

Practical List:

1. Managing DNS zones.
2. Troubleshooting DNS Problems.
3. Managing Network policy.
4. Backup & Restore Active Directory.
5. Creating MMC.
6. Managing Event viewer
7. Creating RODC
8. Cloning DC

Code-SAN 407 A	Fourth Semester	**Open Elective**	Credits:04

University recognized MOOC (NPTEL / SWAYAM / others) OR Intra / Inter Departmental courses

OR

Code-SAN 407 B **Elective**	Third Semester	**Open Elective** **Numerical Aptitude**	Credits:04

Course Objectives:

- Practicing Basics of mathematics
- Use of Numbers
- Finding Percentage and Profit or Loss, Average
- Finding Time, Speed, Distance,
- Use of permutation and combination and Probability

Course Outcomes:

- Develops problem solving skills of student
- Improves Basic and advanced calculations used in day to day life.
- Improves Mental Alertness
- Analytical Thinking

Unit I	**Introduction of Number system**

A. Numbers: Types of numbers, Divisibility tests of numbers, arithmetic progression, Geometric progression, Relationship between Arithmetic progression and Geometric progression.
B. HCF and LCM : Methods of calculating highest common factor and greatest common divisor, factorization method, Division method, Finding HCF and LCM more than two numbers, LCM factorization method, Division method, Finding HCF and LCM more than two numbers, LCM and HCF of fractions and decimal numbers, Applications of LCM and HCF.

Unit II	

A. Average: Definition of average, Formulae and theoretical problem on average.
B. Problem on ages: simultaneous equations and their applications, Theoretical problems on ages, Theoretical problems on numbers.

Unit III	

A. Percentage: Concept of percentage, Application of percentage, Results on populations, Result on depreciations, Theoretical problem on percentage.
B. Profit and Loss: Definition of cost price, selling price and profit, Formulae of profit and loss, Theoretical problems on profit and loss.

Unit IV	

A .Time and Distance: Concept of time and distance, Formulae of time and distance, Theoretical problems on time and distance.
B. Problems on Train: Formulae of problems on train, Theoretical problems on train
C. Boat and streams: Concept of boat and streams, Formulae of boat and streams, Theoretical problems on boat and streams.

Unit V	

A. Time and Work: Concept of time and work, Relationship between time and work, Theoretical problems on time and work.

B. Allegations and Mixtures: Definition of allegation and mixtures, Rules of allegation's, Theoretical problems on mixture and allegation.

Unit VI

A . Simple and Compound Interest: Definition of simple and Compound interest, Formulae of simple and compound interest, Relationship between simple and compound interest, Theoretical problems on simple and compound interest.

B. Permutations and combinations: Definition of permutations and combinations, Formulae of permutation and combinations, Relationship between permutation and combinations, Problems on permutations and combinations.

C. Probability: Definition of probability, Examples of performing a random experiment, Probability of occurrence of an event, Results on probability, Theoretical problems on probability.

Reference Books:

Sr. no.	Name of the book	Author	Publication
1.	Quantitative Aptitude	Dr.R.S Aggarwal	S.Chand and Company
2.	Quantitative Aptitude	AbijitGuha	Tata McGraw Hill Education

Code SAN-408	Fourth Semester	**Skill Based Activity SK-04 : Soft Skills**	Credits:01

- Soft skill Necessary for IT recruitment and further studies
- Strong technical skills are essential for any IT (information technology) position. However, IT employees also need soft skills, sometimes known as interpersonal skills. IT professionals need to be able to interact successfully with others, as well as manage projects and teams.
- Employers have found that many IT professionals possess as many interpersonal skills as anyone else. Technology experts suffering from more severe social handicaps (such as functional forms of autism) are able to practice and learn interpersonal and other soft skills to help them integrate well within a team.