College of Arts,
Science &
Commerce (Autonomous)

SIES

RISE WITH EDUCATION

NAAC REACCREDITED - 'A' GRADE

SIES College of Arts, Science and Commerce (Autonomous)
Affiliated to University of Mumbai

Syllabus under NEP effective from June 2023

Programme: B.Sc.

Subject: Information Technology

Vocational Skill Course

Class: FYBSc(IT)

Semester : I and II

Course Name
Semester I : Computer Networks
Semester II : Operating Systems

Choice Based Credit System (CBCS)
with effect from the academic year 2023-24

SIES COLLEGE OF ARTS, SCIENCE AND COMMERCE, AUTONOMOUS, SION WEST

Semester I
Vocational Skill Course

This Core course is offered to students of BSc(IT) in Semester I, who have chosen Information Technology as Major & Minor subject

Name of Programme: Bachelor of Science			Subject: Information Technology			
Class	**Semester**	**Course Code**	**Course Name**	**No. of lectures/ practical per week**	**Credits**	**Marks**
FYBSc(IT)	I	SIUITVS111	Computer Networks	1L + 1P	2	50
P (Practical) = 2 Hours per week						

Course Name: Computer Networks
Credits: 1   Type: Theory

Expected Course Outcomes

On completion of this course, students will be able to

1. Describe the OSI layers with their services and protocols.

2. Use networking protocols in the context of a conceptual model, such as the OSI or TCP/IP framework.

Unit	Contents	No. of Lectures
I	**Introduction, Network Models**: Protocol layering, TCP/IP protocolsuite, The OSImodel. **Introduction to Physical layer:** Digital and Analog transmission,Transmission media, Switching **Introduction to the Data Link Layer:** Link Layer Addressing, data linklayer protocols **Introduction to the Network Layer:** Network layer services, packet switching, network layer performance, IPv4 addressing, Internet Protocol, IPv6 addressing and protocol,Unicast Routing: Introduction, routing algorithms **Introduction to the Transport Layer:** TCP and UDP Protocol Standard Client Server Protocols: World wide-web and HTTP, FTP,Electronic mail, Telnet, Secured Shell, Domain name system.	15

Course Name: Computer Networks	
Credits: 1 Type: Practical	

Expected Course Outcomes

On completion of this course, students will be able to

1. Solve problems related to IP Addressing
2. Execute the basic networking commands
3. Implement the routing protocols and application layer protocols

List of Practical (To be implemented using network simulators)

Practical No.	Title

1.	**IPv4 Addressing and Subnetting**
	a) Given an IP address and network mask, determine other information about theIP address such as:
	    • Network address
	    • Network broadcast address
	    • Total number of host bits
	    • Number of hosts
	b) Given an IP address and network mask, determine other information about theIP address such as:
	    • The subnet address of this subnet
	    • The broadcast address of this subnet
	    • The range of host addresses for this subnet
	    • The maximum number of subnets for this subnet mask
	    • The number of hosts for each subnet
	    • The number of subnet bits
	The number of this subnet

2.	Use of ping and tracert / traceroute, ipconfig / ifconfig, route and arp utilities.
3.	Configure IP static routing.
4.	Configure IP routing using RIP.
5.	Configuring OSPF.
6.	Configuring DHCP server and client.
7.	Configuring DNS Server and client.
8.	Scan and check the packet information of following protocols HTTP, ICMP, TCP, SMTP, POP3

References
1. Data Communication and Networking, Behrouz A Forouzan, Tata McGraw Hill, 5th Edition, 2013.
2. TCP/IP Protocol Suite, Behrouz A Forouzan, Tata McGraw Hill, 4th Edition, 2010.
3. Computer Networks, Andrew Tanenbaum, Pearson, 4th Edition, 2013.

Scheme of Evaluation:

I) Continuous Internal Evaluation (20 Marks)	
Class Test	20 Marks
II) Practical Examination (30 Marks)	
Certified Journal	5 marks
Viva Voce	5 marks
Practical exam	20 marks

Semester II
Vocational Skill Course

Name of Programme: Bachelor of Science			Subject: Information Technology			
Class	**Semester**	**Course Code**	**Course Name**	**No. of lectures/ practical per week**	**Credits**	**Marks**
FYBSc(IT)	II	SIUITVS121	Operating Systems	1L + 1P	2	50
P (Practical) = 2 Hours per week						

Course Name: Operating Systems
Credits: 1   Type: Theory

Expected Course Outcomes
On completion of this course, students will be able to

1. Understand the various services of the operating systems.
2. Compare and contrast various memory management schemes
3. Analyse various scheduling algorithms.

Unit	Contents	No. of Lectures
I	**Introduction:** What is an operating system? History of operating system, computer hardware, different operating systems, operating system concepts, system calls, operating system structure. **Processes and Threads:** Processes, threads, interprocess communication, scheduling, IPC problems. **Memory Management:** No memory abstraction, memory abstraction: address spaces, virtual memory, page replacement algorithms, design issues for paging systems, implementation issues, and segmentation. **Input-Output:** Principles of I/O hardware, Principles of I/O	15

| | software, I/O software layers, disks, clocks, user interfaces: keyboard, mouse, monitor, thin clients, and power management.

Deadlocks: Resources, introduction to deadlocks, the ostrich algorithm, deadlock detection and recovery, deadlock avoidance, Deadlock prevention, issues. | |

Course Name: Operating Systems Credits: 1 Type: Practical	
Expected Course Outcomes On completion of this course, students will be able to 1. Work on Command Line Operating systems like DOS and LINUX. 2. Understand the CPU scheduling algorithms and page replacement algorithms.	
Practical No.	**Title**
1.	Installation of virtual machine software.
2.	Installation of Linux operating system (RedHat / Ubuntu) on virtual machine..
3.	Installation of Windows operating system on virtual machine.
4.	**Linux commands: Working with Directories:** pwd, cd, absolute and relative paths, ls, mkdir, rmdir, file, touch, rm, cp. mv, rename, head, tail, cat, tac, more, less, strings, chmod
5.	**Linux commands: Working with files:** ps, top, kill, pkill, bg, fg, grep, locate, find, locate. date, cal, uptime, w, whoami, finger, uname, man, df, du, free, whereis, which. Compression: tar, gzip.
6.	**Windows (DOS) Commands:** Date, time, prompt, md, cd, rd, path. Chkdsk, copy, xcopy, format, fidsk, cls, defrag, del, move. Diskcomp, diskcopy, diskpart, doskey, echo. Edit, fc, find, rename, set, type, ver

7.	**CPU Scheduling Algorithms:**
	   a. First Come First Serve (FCFS)
	   b. First Come First Serve (FCFS)
	   c. Round Robin

8.	**Page Replacement Algorithms:**
	   a. First In First Out (FIFO)
	   b. Least Recently Used (LRU)

References
1. Modern Operating Systems, Andrew Tanenbaum and Herbert Bos, Pearson, 4th Edition, 2014.
2. Operating Systems-Internals and Design Principles, Willaim Stallings, Pearson, 8th Edition, 2009.
3. Operating System Concepts, Abraham Silberschartz, Wiley, 9th Edition, 2012.
4. Operating Systems, Godbole and Kahate, McGrawHill, 3rd Edition, 2017.

Scheme of Evaluation:

I) Continuous Internal Evaluation (20 Marks)	
Class Test	20 Marks
II) Practical Examination (30 Marks)	
Certified Journal	5 marks
Viva Voce	5 marks
Practical exam	20 marks