SECOND YEAR OF BACHELOR OF SCIENCE MINOR PHYSICS REVISED SYLLABUS ACCORDING TO CBCS NEP2020

SEMESTER-III
W.E.F. 2024-2025

Recommended by the Board of Studies in PHYSICS
And
Approved by the Academic Council
Devrukh Shikshan Prasarak Mandal's
Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and
Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.
Tal Sangmeshwar, Dist. Ratnagiri-415804, Maharashtra, India

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce and Vid. Dadasaheb Pitre Science College, Devrukh (An Autonomous College Affiliated with University of Mumbai)

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Academic Council Item No: _____

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangmeshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Department	:	Physics
Name of the Class	:	Second Year
Semester	:	Third
Paper	:	I
No. of Credits	:	02
Title of the Course	:	Digital Communication
Course Code	:	S307PHT
Name of the Vertical in adherence to NEP 2020	:	Minor
Eligibility for Admission	:	Any 12th Pass seeking Admission to Degree Programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra
Passing Marks	:	40%
Mode of Assessment	:	Formative and Summative
Level	:	UG
Pattern of Marks Distribution for TE and CIA	:	60:40
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2024-2025
Ordinances /Regulations (if any)		

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Syllabus for Second Year of Bachelor of Science

(With effect from the academic year 2024-2025)

SEMESTER - III   **Paper No.– Minor(CS) – I**

Course Title: Digital Communication   **No. of Credits - 02**

Type of Vertical: Minor   **COURSE CODE: S307PHT**

Learning Outcomes Based on BLOOM's Taxonomy:

After completing the course, the learner will be able to…		
Course Learning Outcome No.	Blooms Taxonomy	Course Learning Outcome
CLO-01	Remember	To gain the knowledge of the basic computer network technology.
CLO-02	Understand	To understand the network models and associated layers
CLO-03	Understand	To understand the functions of each layer in the OSI & TCP/IP reference models.
CLO-04	Apply	To describe the essential protocols of computer networks.
CLO-05	Apply	To setup a local area network.

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	COURSE CONTENT		
Module	**Content**	**Credits**	**No. of Lectures**
1	**Theory** Network hardware, Network software, OSI, TCP/IP Reference models, Example Networks: ARPANET, Internet. Physical Layer: Guided Transmission media: twisted pairs, coaxial cable, fiber optics, Wireless Transmission. Data link layer: Design issues, framing, Error detection and correction. Elementary data link protocols: simplex protocol, A simplex stop and wait protocol for an error-free channel, A simplex stop and wait protocol for noisy channels. Sliding Window protocols: A one-bit sliding window protocol, A protocol using Go-Back-N, A protocol using Selective Repeat, Example data link protocols. Medium Access sublayer: The channel allocation problem, Multiple access protocols: ALOHA, CSMA protocols, collision free protocols. Wireless LANs, Data link layer switching. Network Layer: Design issues, Routing algorithms: shortest path routing, Flooding, Hierarchical routing, Broadcast, Multicast, distance vector routing, Congestion Control Algorithms, Quality of Service, Internetworking, The Network layer in the internet. Transport Layer: Transport Services, Elements of Transport protocols, Connection management, TCP and UDP protocols. Application Layer –Domain name system, SNMP, Electronic Mail; the World WEB, HTTP, Streaming audio and video.	**01**	**15**
2	**Practicals** • Understanding the working of NIC cards, Ethernet/Fast /Gigabit Ethernet. • Crimping of Twisted-Pair Cable with RJ45connector for Straight-Through, Cross-Over, Roll-Over. • To understand their respective role in networks/internet. • Problem solving with IPv4, which will include concept of Classful addressing. (supportive Hint: use Cisco Binary Game) • Using, linux-terminal or Windows-cmd, execute following networking commands and note the output: ping, traceroute, netstat, arp, ipconfig. • Using Packet Tracer, create a basic network of two computers using appropriate network wire. • Using Packet Tracer, connect multiple (min.6) computers using layer 2 switch. • Using Packet Tracer, connect a network in triangular shape with three layer two switches and every switch will have four computer. Verify their connectivity with each other. • Using Packet Tracer, create a wireless network of multiple PCs using appropriate access point. • Using Wireshark, network analyzer, set the filter for ICMP, TCP, HTTP, UDP, FTP and perform respective protocol transactions to show/prove that the network analyzer is working.	**01**	**30**
	Total	**02**	**45**

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TEXT BOOK:
- Computer Networks -- Andrew S Tanenbaum, David. J. Wetherall, 5th Edition. Pearson
- Education/PHI
- Techmax publication book

REFERENCE BOOKS:
- An Engineering Approach to Computer Networks-S. Keshav, 2nd Edition, Pearson Education
- Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH.

Required Previous Knowledge

Basic Computer Knowledge would be beneficial but not essential.

Access to the Course

The course is available for all the students admitted for Second Year Bachelor of Computer Science as a Minor. Students seeking admission to other disciplines may select the course as a minor considering the terms and conditions laid down by the University of Mumbai, the Government of Maharashtra, and the college, from time to time.

Forms of Assessment

The assessment of the course will be of Diagnostic, Formative and Summative type. At the beginning of the course diagnostic assessment will be carried out. The formative assessment will be used for the Continuous Internal Evaluation whereas the summative assessment will be conducted at the end of the term. The weightage for formative and summative assessment will be 60:40. The detailed pattern is as given below.

Term End Evaluation (30 Marks)
Question Paper Pattern
Time: 1 hr 15 min

Question No.	Unit/s	Question Pattern	Marks
Q.1	All	Fill in the Blanks	
Q.2	All	Theory questions (any five out of eight)	
Q.3	All	Find the output (any five out of eight)	
Q.4	All	Programming exercises (any five out of eight)	
		Total	**30**

Internal Evaluation (20 Marks)

Sr. No.	Description	Marks
1	Mid Term Examination	
2	Classroom Performance based on self-study	
3	Assignments	
	Total	**20**

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Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade on the grading scale, and grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

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