



K.S. INSTITUTE OF TECHNOLOGY, BANGALORE – 560109
DEPARTMENT OF COMPUTER AND COMMUNICATIONS ENGINEERING
TEACHING AND LEARNING
CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	Ranjana S. Chakrasali
Course Name /Code	Introduction to Python Programming / 25BPLC105A
Semester/Section	I / A
Activity Name	Applications on Data Structures of Python
Topic Covered	Data Structures of Python
No. of Participants	32 (group of 2 or 3 was assigned with a Problem statement for each batch)
Objectives/Goals	Understand usage of different data structures and learn practical applications of it and henceforth improving their knowledge.
ICT Used	LCD + Systems with Jupyter Notebook/ Python IDLE.
Relevant CO's	CO1, CO2, CO3, CO4, CO5
Relevant PO's	PO1, PO2, PO3, PO5
Significance of Results/Outcomes	Students were able to: Implement mini applications for the assigned problem statement
Reflective Critique	<ul style="list-style-type: none">• Students learnt applicability of data structures such as Lists, Dictionaries, Tuples and Strings.• Students had hands-on experience of developing mini applications in Python.
Proofs attached: <ol style="list-style-type: none">1. Report is submitted by each batch2. The activity report consists of the following topics and was submitted by each group.<ol style="list-style-type: none">1. Cover page2. Bonafide certificate3. Table of contents4. Acknowledgement5. Abstract6. Introduction7. Implementation Details with code8. Applications of Topic9. Advantages and Disadvantages of Topic10. Conclusion11. References	

R. Chakrasali

Signature of the Course In-charge

[Signature]

Signature of HOD

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Dept. of Computers and Communication Engg.
K. S. Institute of Technology
Bengaluru - 560 109.



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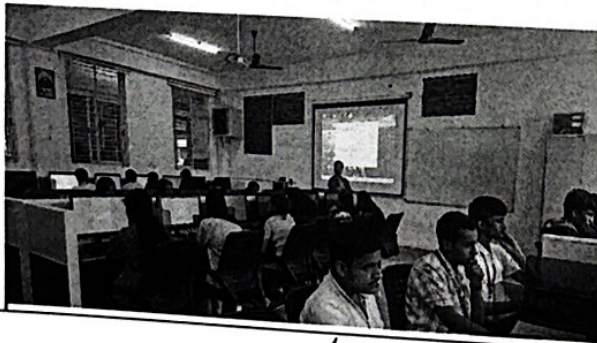
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CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	Dr.Chanda V Reddy
Course Name /Code	ESSENTIALS OF INFORMATION TECHNOLOGY / 25BESC104E
Semester / Section	I / J
Activity Name	HANDS ON ACTIVITY - FOR DEVELOPING WEB PAGE
Topic Covered	Introduction to HTML and Website Development
Date	
No. of Participants	32
Objectives/Goals	<ul style="list-style-type: none"> To create practical implementation awareness To generate practical Knowledge To use modern tool
ICT Used	Systems
Appropriate Method/Instructional materials/Exam Questions <ul style="list-style-type: none"> Lab session 	
Relevant PO's	5, 9,10,12
Significance of Results/Outcomes	<ul style="list-style-type: none"> Hands-on gives knowledge in depth. Hands-on gives practical knowledge
Reflective Critique	<ul style="list-style-type: none"> The activity improved the learning and communication skills of students The activity provided a platform for students to interact with peers, improve their communication skills and work as individuals. Learnt modern tool for implementation

Proofs : Report is attached

Photo:



Signature of Course Incharge

Signature of HOD CCE



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CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	SHRUTHI P
Course Name /Code	INTRODUCTION TO AI AND APPLICATIONS/25BETCK103
Semester/Section	I/ J
Activity Name	Online Certification (Infosys Springboard / Udemy)
Topic Covered	Introduction to AI and chatGPT
No. of Participants	32
Objectives/Goals	To provide an understanding of basics of AI and ChatGPT. This course explains concepts of and applications.
ICT Used	E-Learning
Appropriate Method/Instructional materials/Exam Questions	
Infosys Springboard: Learning Basics for Beginners: Introduction to AI and chatGPT Udemy: Learning Basics for Beginners: Learn Coding with Java	
Relevant PO's	PO1, PO2, PO3, PO5, PO10
Significance of Results/Outcomes	Students were able to understand the applications of AI like ChatGPT.
Reflective Critique	<ul style="list-style-type: none">• This courses help students understand the basics of AI and applications.• It supports students in developing problem-solving skills and automation skills.

Sample Course Completion Certificate



Udemy

CERTIFICATE OF COMPLETION

Introduction to AI and ChatGPT

Instructors: Imran Afzal

Deeksha.B.T.

Date: Jan. 13, 2026

Length: 7.5 total hours

Signature of the Course In-charge

Signature of HOD

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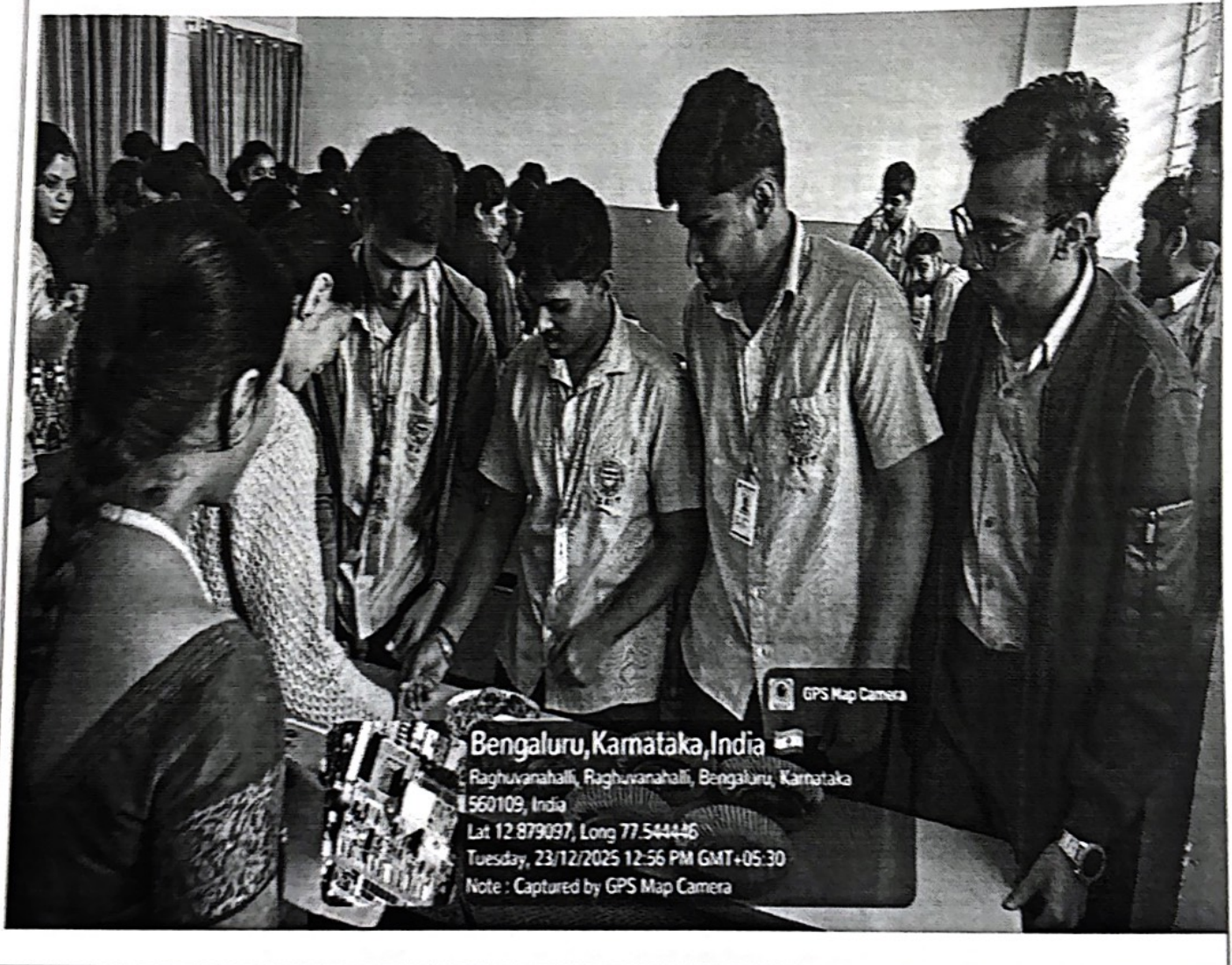
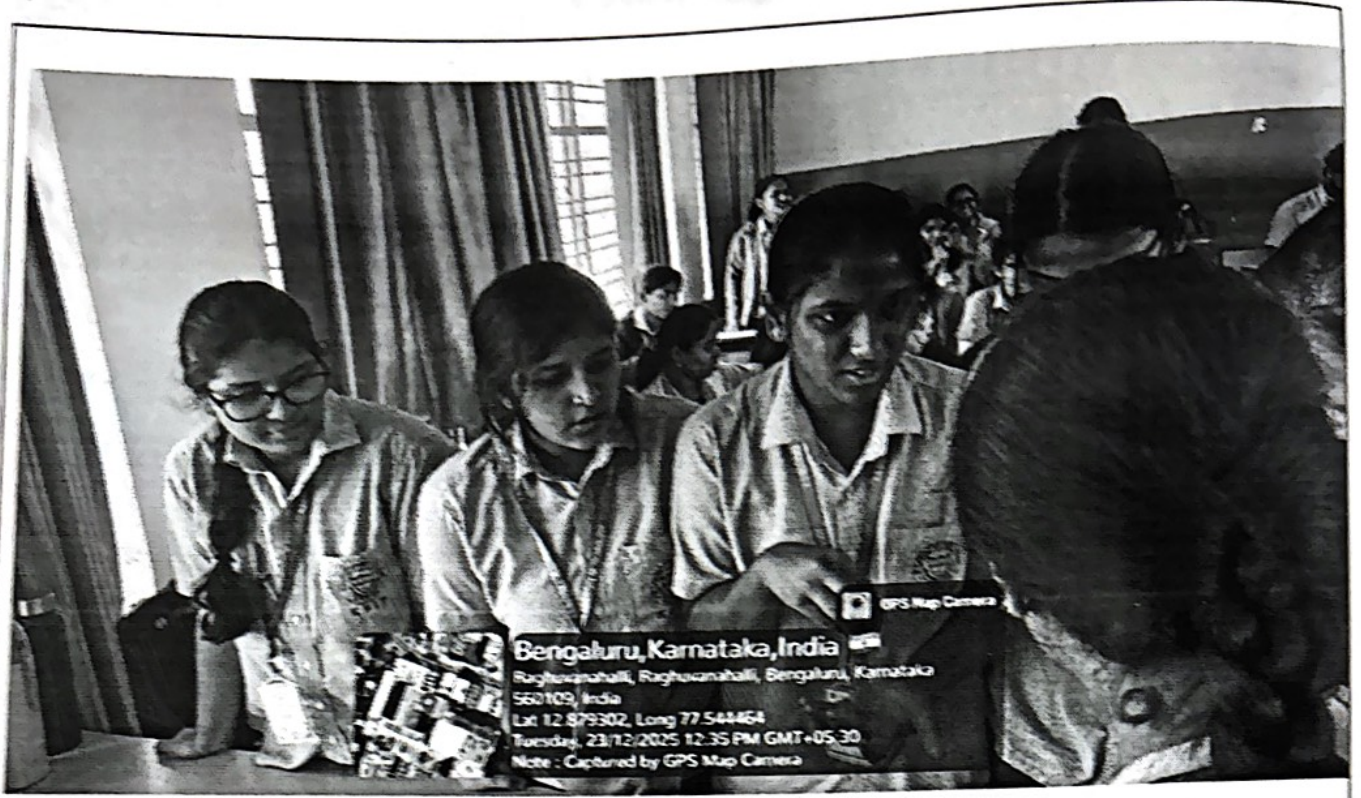
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

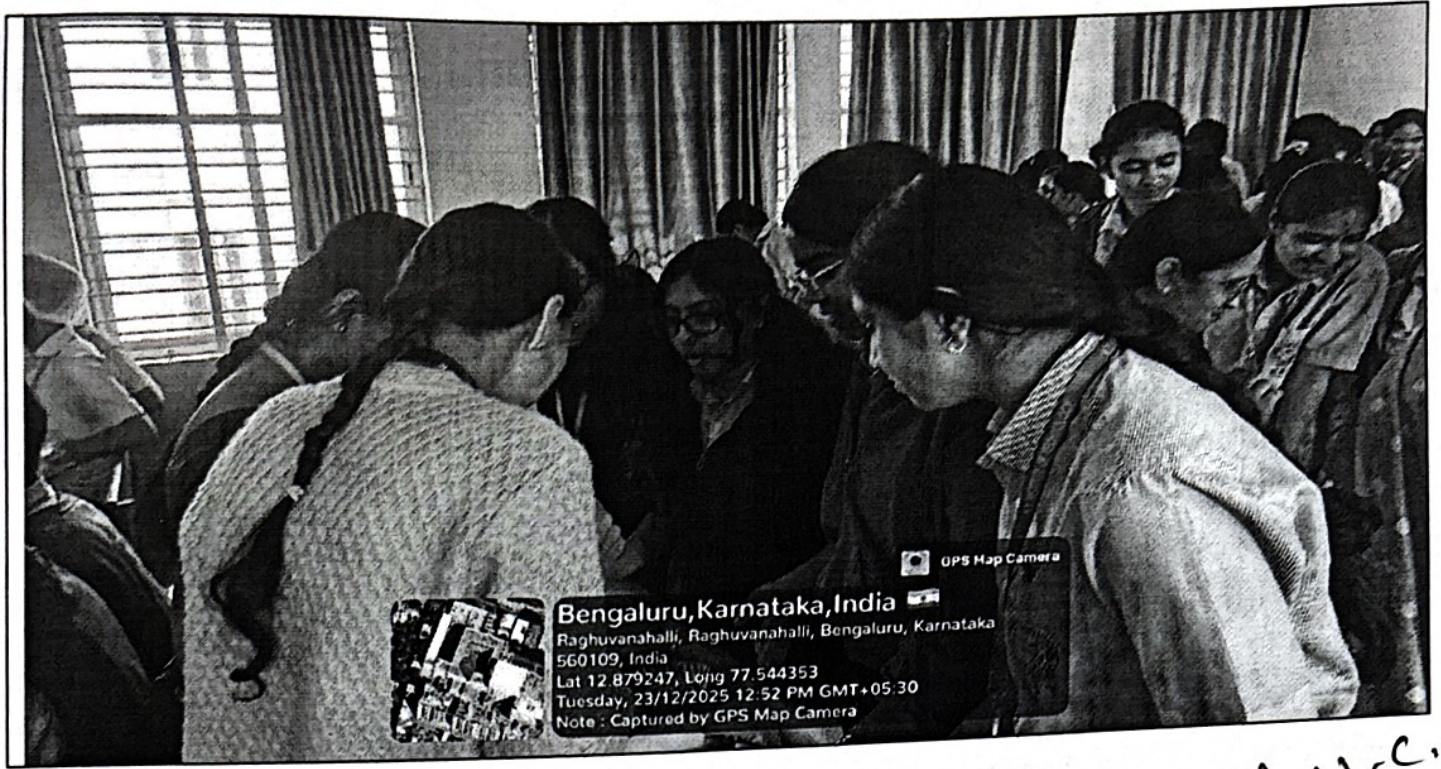
TEACHING AND LEARNING

CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	T. Naga Jyothi
Course Name /Code	Social Connect and Responsibility
Semester	III
Activity Name	Poster and Cooking without Fire
Topic Covered	Water Conservation, Organic Farming, Waste Management, Food Walk
Date	23/12/2025 & 29/12/2025
No. of Participants	56
Objectives/Goals	<ul style="list-style-type: none">• Awareness about Organic farming and Water Conservation• To use modern tool
ICT Used	PPT and Systems
Appropriate Method/Instructional materials/Exam Questions <ul style="list-style-type: none">• Utilising Canva/Figma tools to create Poster• Practical Preparation of Food Walk	
Relevant PO's	PO8,PO9,PO10,PO11,PO12
Significance of Results/Outcomes	<p>POSTER:s</p> <ul style="list-style-type: none">• Teamwork & Collaboration – working together to achieve common goals.• Communication Skills – expressing ideas clearly and listening actively.• Ethical Awareness – acting responsibly toward people and environment <p>COOKING WITHOUT FIRE</p> <p>Collaboration & Social Connect</p> <ul style="list-style-type: none">• Students work in teams, share tasks, and build stronger peer relationships. <p>Responsibility & Safety</p> <ul style="list-style-type: none">• Promotes safe cooking practices and responsibility in handling food. <p>Creativity & Innovation</p> <ul style="list-style-type: none">• Encourages new ideas, presentation skills, and problem-solving. <p>Ethical & Environmental Awareness</p> <ul style="list-style-type: none">• Reinforces sustainable cooking methods (no fuel, less pollution).
Reflective Critique	<ul style="list-style-type: none">• This activity focuses on Team Work• The activity provided a platform for students to interact with peers, improve their communication skills and work as individuals.• Learnt modern tool for implementation of poster

Proof : Significant photos are attached






Signature of Course Incharge

For Sheetle H-C
Signature of HOD CCE



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CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	SHASHIKALA H.C.
Course Name /Code	DATA STRUCTURE AND APPLICATION /BCS304
Semester	III
Activity	HANDS ON EXPERIENCE
Topic Covered	TOWER OF HONAI PAZZLE
Date	21/10/2025 and 4/11/2025 (For experiment 5)
No. of Participants	63
Objectives/Goals	<ul style="list-style-type: none"> To create practical implementation awareness To generate practical Knowledge
ICT Used	PPT and Systems
Appropriate Method/Instructional materials/Exam Questions	
<ul style="list-style-type: none"> Lab session 	
Relevant PO's	5, 9,10
Significance of Results/Outcomes	<ul style="list-style-type: none"> Hands-on gives knowledge in depth. Hands-on gives practical knowledge
Reflective Critique	<ul style="list-style-type: none"> The activity improved the learning and communication skills of students The activity provided a platform for students to interact with peers, improve their communication skills and work as individuals.

The Tower of Hanoi is a classic mathematical puzzle invented by Édouard Lucas in 1883, consisting of three rods and n disks of different sizes. The objective is to move the entire stack to another rod, obeying the rules: only one disk moves at a time, only the top disk can be moved, and no larger disk may be placed on a smaller one. The minimum moves required is $(2^n - 1)$.

Key Details of the Tower of Hanoi

- Origin:** Created by French mathematician Édouard Lucas in 1883, sometimes associated with a legend of Brahma's temple with 64 gold disks.
- Rules:**
 - Only one disk can be moved at a time.
 - Only the uppermost disk from a stack can be moved.
 - A larger disk cannot be placed on top of a smaller disk.
- Objective:** Move all disks from the source peg to the destination peg using an auxiliary peg.
- Mathematical Complexity:** The minimum number of moves required to solve a puzzle with n disks is $2^n - 1$.

- 3 disks = 7 moves
- 4 disks = 15 moves
- 5 disks = 31 moves

Recursive Algorithm and Solution

The problem is famously solved using recursion:

Goal is to move the entire stack to another rod (rod C) while following these rules:

Move only one disk at a time.

At each step, you can take the top disk from any rod and place it on another rod.

A disk can only be moved if it is the topmost disk of a rod.

No larger disk may be placed on top of a smaller disk.

Examples:

Input: $n = 3$

Output:

Disk 1 moved from A to C

Disk 2 moved from A to B

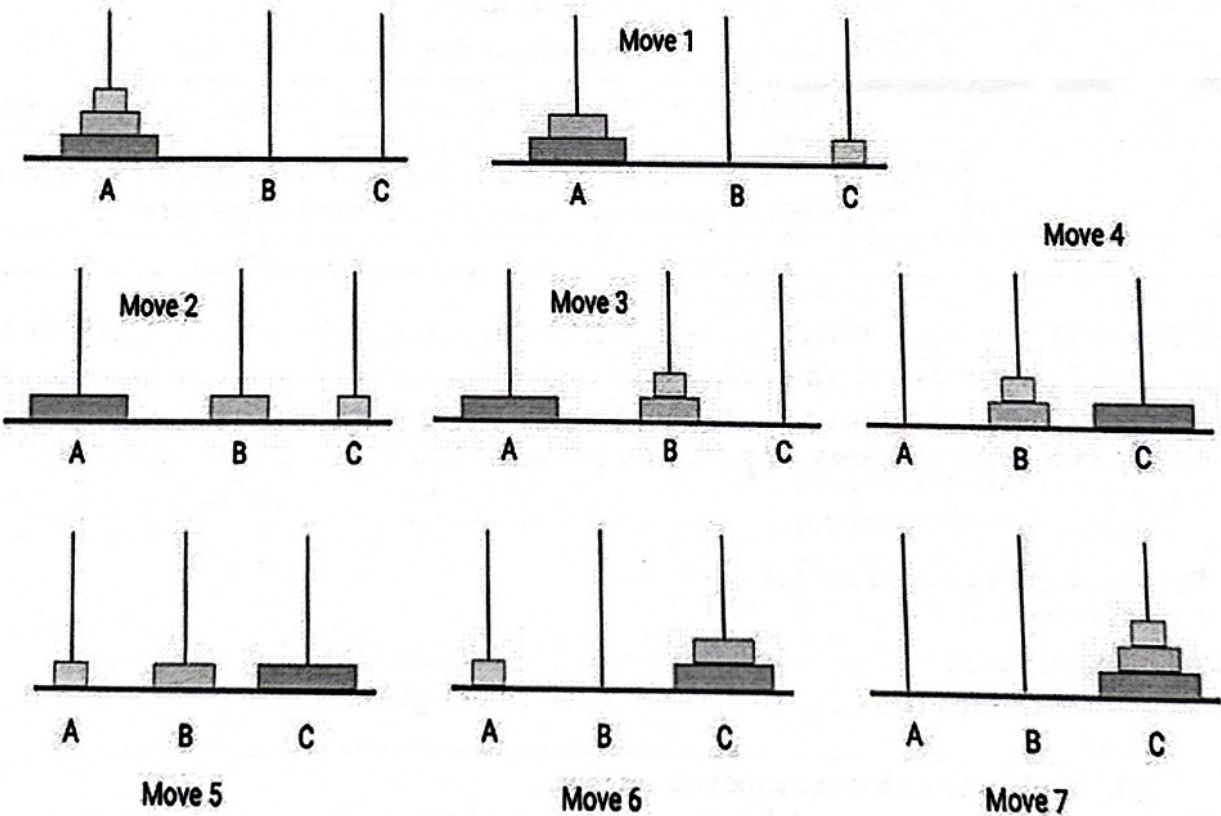
Disk 1 moved from C to B

Disk 3 moved from A to C

Disk 1 moved from B to A

Disk 2 moved from B to C

Disk 1 moved from A to C



Applications and Significance

- **Computer Science:** Frequently used to teach recursion in programming.
- **Psychology:** Used to test cognitive function, problem-solving abilities, and executive functioning.
- **Variations:** While the classic puzzle has 3 pegs, variations include more pegs to increase complexity.

Shree H.C.

Signature of Course In charge



Signature of HOD CCE

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Details of Content beyond syllabus Activities-2025-26 (ODD)

SEMESTER: III

SUBJECT: Operating Systems

Academic year	2025-2026
Name of the Faculty	T NAGA JYOTHI
Course Name/Course Code	OPERATING SYSTEMS BCS303
Semester	III
Activity Name	Course on Infosys Springboard
Topic Covered	All Modules
Date	November 2025
No of Participants	56
Objectives/Goals	<ul style="list-style-type: none">• Complete knowledge of Operating system, System calls, Memory Management, Virtual Memory
ICT used	Laptop
Appropriate Method /Instructional Materials/Exam Questions <ul style="list-style-type: none">• Assessment on Introduction to Operating Systems	
Relevant PO's	1,2,3,4,11
Significance of results/Outcomes	Students understood concept of Operating Systems
Proof: Sample Certificate attached	


Signature of Course-Incharge

For

Signature of HOD



PROGRAM COMPLETION CERTIFICATE

The certificate is awarded to

Manya Siddappaji

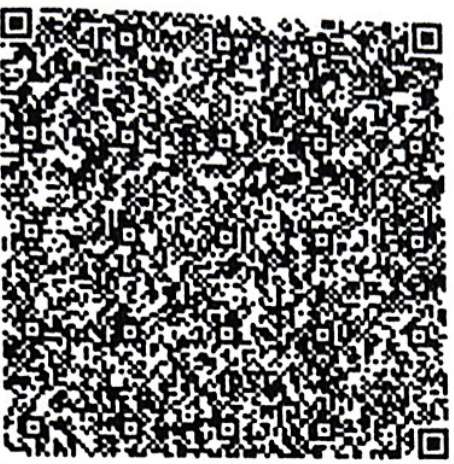
for successfully completing the program

Introduction to Operating Systems Journey

on November 9, 2025

Infosys | Springboard

Congratulations! You make us proud!



Issued on: Tuesday, November 11, 2025
To verify, scan the QR code at <https://verify.onwingspan.com>

Satheesha B N

Satheesha B. Nanjappa
Senior Vice President and Head
Education, Training and Assessment
Infosys Limited



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CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	Dr.Chanda V Reddy
Course Name /Code	Digital Design and Computer Organization / BCS30 2
Semester	III
Activity Name	HANDS – ONACTIVITY
Topic Covered	HDL
Date	27/03/2025
No. of Participants	58
Objectives/Goals	<ul style="list-style-type: none">• To create practical implementation awareness• To generate practical Knowledge• To use modern tool
ICT Used	Systems – HDL
Appropriate Method/Instructional materials/Exam Questions <ul style="list-style-type: none">• Lab session	
Relevant PO's	5, 9,10,12
Significance of Results/Outcomes	<ul style="list-style-type: none">• Hands-on gives knowledge in depth.• Hands-on gives practical knowledge
Reflective Critique	<ul style="list-style-type: none">• The activity improved the learning and communication skills of students• The activity provided a platform for students to interact with peers, improve their communication skills and work as individuals.• Learnt modern tool for implementation

Proofs : Report is attached

Signature of Course Incharge

Signature of HOD CCE

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ENGINEERING

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CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	MANGALA S. HIREMATH
Course Name /Code	OBJECT ORIENTED PROGRAMMING WITH JAVA/BCS306A
Semester/Section	III/ A
Activity Name	Online Certification (Infosys Springboard / Udemy)
Topic Covered	Learning Basics for Beginners: Learn Coding with Java
No. of Participants	60
Objectives/Goals	To provide an understanding of fundamental programming concepts using Java. This course explains basic syntax, control structures, Object-oriented features and problem-solving approaches essential for beginner-level coding.
ICT Used	E-Learning
Appropriate Method/Instructional materials/Exam Questions	
Infosys Springboard: Learning Basics for Beginners: Learn Coding with Java Udemy: Learning Basics for Beginners: Learn Coding with Java	
Relevant PO's	PO1, PO2, PO3, PO5, PO10
Significance of Results/Outcomes	Students were able to understand the concepts of Java.
Reflective Critique	<ul style="list-style-type: none">• Java courses help students understand basic programming concepts and improve their coding proficiency.• It supports students in developing problem-solving skills and prepares them for higher-level programming courses and career opportunities.

Head of the Department

Dept. of Computer and Communication
K. S. Institute of Technology
Bangalore - 560109

Sample Course Completion Certificate



Infosys®
Navigate your next

===== COURSE COMPLETION CERTIFICATE =====


The certificate is awarded to
Ganesh Gurav
for successfully completing the course
Java Basics for Beginners: Learn Coding with Java
on November 17, 2025



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Congratulations! You make us proud!

Sathesha B N
Sathesha B. Narajappa
Senior Vice President and Head
Education, Training and Assessment
Infosys Limited

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Udemy

Certificate no. 132-06220164-4409-4050-4744-4014401600
Certificate url: <https://udemy.com/certificate/verify-credential?certificate=132-06220164-4409-4050-4744-4014401600>
Reference Number: 6604

CERTIFICATE OF COMPLETION

Java Basics for Beginners: Learn Coding with Java

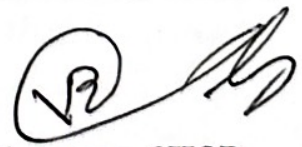
Instructors: **Victor Gorinov**

Tejas Reddy B

Date: **Nov. 21, 2025**
Length: **2 total hours**



Signature of the Course In-charge



Signature of HOD

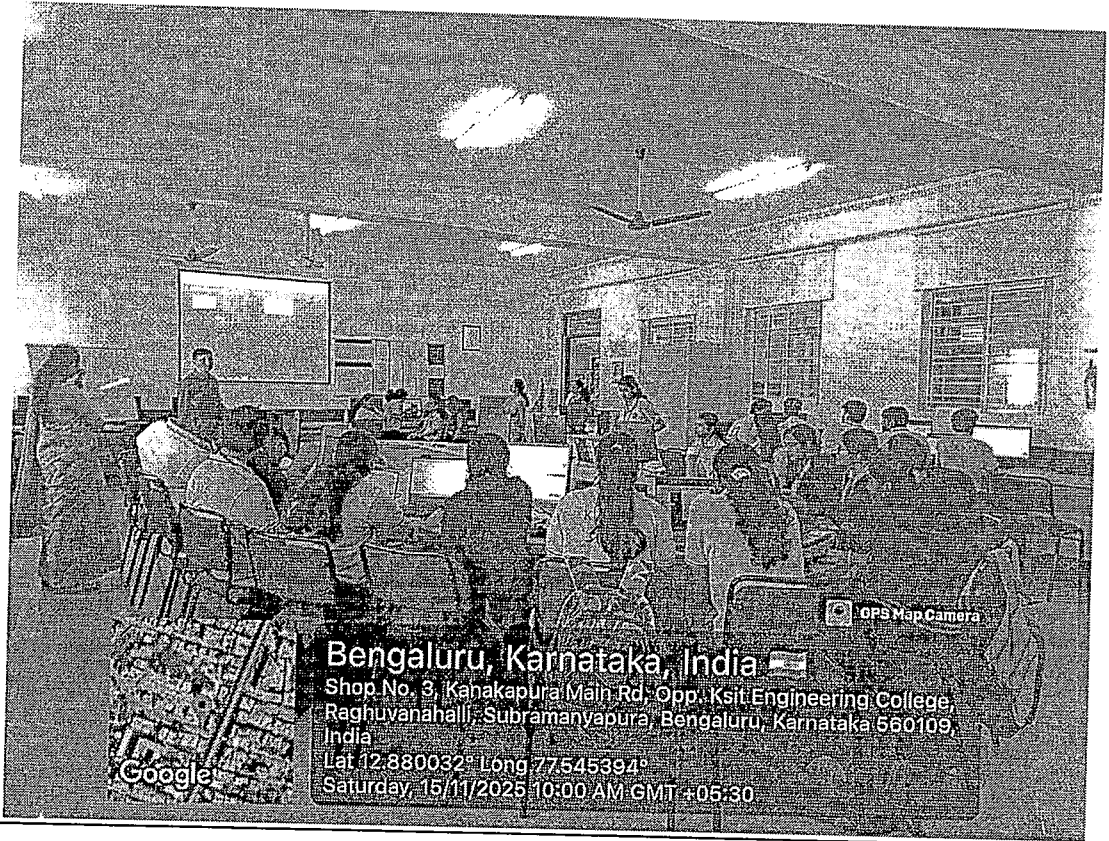
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CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	Shilpa M.
Course Name /Code	Embedded system/BCE515B
Semester/Section	V/ A
Activity Name	<ol style="list-style-type: none"> 1. Workshop on “PCB layout design” 2. Online certification on “Introduction to IoT
Topic Covered	PCB layout design (Module 3). IoT (Beyond syllabus)
No. of Participants	59
Objectives/Goals	To understand Design Thinking practically and henceforth improving their knowledge. To Understand the principles of PCB layout design. To Understand the basic concepts of IoT.
ICT Used	BB+LCD+Systems with software OrCAD.
Appropriate Method/Instructional materials/Exam Questions <ol style="list-style-type: none"> 1. Workshop conducted hands-on. on the OrCAD tool and physical design of the PCB. 2. Online certification through self-paced video lectures. 	
Exam Questions <ol style="list-style-type: none"> 1. Briefly explain the following terms with respect to PCB layout design <ol style="list-style-type: none"> a. Footprint b. Via c. traces/routes d. layers 2. Explain the different types of packages available in PCB layout design. 	
Relevant CO's	CO1, CO3
Relevant PO's	PO8, PO9, P10, PO11, PO12
Significance of Results/Outcomes	Students were able to DESIGN A CIRCUIT USING SCHEMATIC ENTRY AND BUILD THE PCB LAYOUT FOR THE SAME. Circuits done -- Power supply circuit, Astable multivibrator using IC 555.
Reflective Critique	<ul style="list-style-type: none"> • Workshop helped students to have experiential learning of the tool described in the module. • Students had hands on with the tool and they physically built a PCB for power supply circuit.

**Proofs attached:
Photos of the PCB designed**





GPS Map Camera

Bengaluru, Karnataka, India

Vgiw+54c, Raghuvanahalli, Bangalore City Municipal Corporation Layout, Bengaluru, Karnataka 560109, India
Lat 12.880229° Long 77.545086°
Saturday, 15/11/2025 09:58 AM GMT +05:30

Google



GPS Map Camera

Bengaluru, Karnataka, India

Manjunath Nilayam, Raghuvanahalli, Bangalore City Municipal Corporation Layout, Bengaluru, Karnataka 560109, India
Lat 12.879141° Long 77.5448°
Saturday, 15/11/2025 10:14 AM GMT +05:30

Google

Certificates of the online course on "Introduction to IoT".

simple|learn | SkillUP


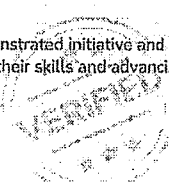
CERTIFICATE OF COMPLETION

S.Ajay Kumar

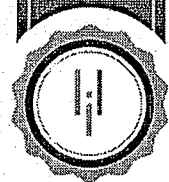
has successfully completed the online course:
Introduction to IoT

This professional has demonstrated initiative and a commitment to deepening their skills and advancing their career. Well done!

4th November 2025
Certificate code : 9318042



Krishna Kumar
CEO, Simplelearn



simple|learn | SkillUP


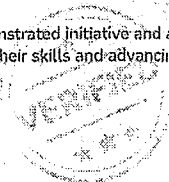
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Pruthvi Devi V

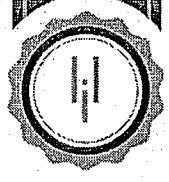
has successfully completed the online course:
Introduction to IoT

This professional has demonstrated initiative and a commitment to deepening their skills and advancing their career. Well done!

6th October 2025
Certificate code : 9111324



Krishna Kumar
CEO, Simplelearn



Shalpa - M

Signature of Course-Incharge



Signature of HOD, CCE

Head of the Department
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CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	D SARITHA
Course Name /Code	Software Engineering & Project Management /BCS501
Semester/Section	V/ A
Activity Name	Infosys Spring Board Certificate
Topic Covered	Software engineering and agile tool development
No. of Participants	63
Objectives/Goals	To understand and agile tool to improving their knowledge.
ICT Used	PPT
Relevant PO's	PO8, PO9, P10, PO11, PO12
Significance of Results/Outcomes	Students were able to Understand the agile tools

Proofs attached:



COURSE COMPLETION CERTIFICATE

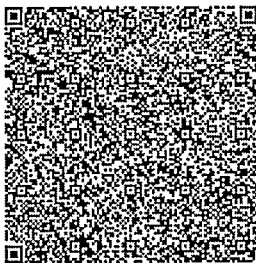
The certificate is awarded to

Hamsa Seetharam

for successfully completing the course

Software Engineering and Agile software development

on November 12, 2025



Infosys | Springboard

Congratulations! You make us proud!

Sattheesha B.N.

Sattheesha B. Nanjappa
Senior Vice President and Head
Education, Training and Assessment
Infosys Limited

Issued on: Wednesday, November 12, 2025
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COURSE COMPLETION CERTIFICATE

The certificate is awarded to

Pruthvi Pruthvi

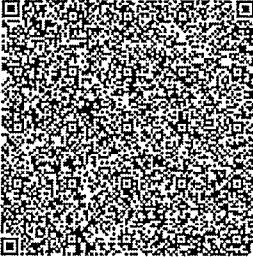
for successfully completing the course

Software Engineering and Agile software development

on November 12, 2025

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Satheesha B.N.
Satheesha B. Nanjappa
Senior Vice President and Head
Education, Training and Assessment
Infosys Limited

She
Signature of the Course In-charge

For Sheesha, H E
Signature of HOD
Head of the Department
Dept. of Computers and Communication Engg.
K. S. Institute of Technology
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CONTENT BEYOND SYLLABUS

Academic Year	2025-2026(ODD)
Name of the Faculty	SHASHIKALA H.C.
Course Name /Code	DATA COMMUNICATION/BCM502
Semester/Section	5th
Activity Name	Hands on Lab Seminar
Topic Covered	IPV4, Subnetting and Subnet mask
Date	26-09-2025
No. of Participants	63
Objectives/Goals	Summarize the impact of these activities on students' skills (analytical, technical, soft skills).
ICT Used	CISCO Packet Tracer Tool with PC/Laptops

SL-NO	Pedagogical Initiative / Activity	Description (Details of Activity)	CO Attained	PO Attained	Assessment Method	Marks
1	Hands-on Lab	"Power full Networking simulation Tools (Ex: Cisco Packet Tracer: practice networking, IoT, and cybersecurity skills in a virtual lab – no hardware needed!)" - Practical sessions on Protocol implementation and IP deployment.	CO3	PO1, PO2, PO4, PO5, PO9, PO11	Demonstration of each protocol working in the internet and its simulation	10
2	Seminar	"Advanced Data Communication Techniques (IPV4, subnet and subnet mask using Cisco packet tracer)" - 2 Practical sessions	CO1, CO2	PO1, PO2, PO4, PO5, PO9, PO11	Presentation, Report	10

Appropriate Method/Instructional materials/Exam Questions

- Assigned different protocols to different students
- Students were given demo on their respective topics

PO1: Science and engineering Knowledge
PO2: Problem Analysis
PO3: Design & Development
PO4: Investigations of Complex Problems
PO5: Engineering Tool Usage

PO6: The Engineer and The World
PO7: Ethics
PO8: Individual and Collaborative Team Work
PO9: Communication
PO10: Project Management & Finance
PO11: Lifelong Learning

Mapped CO's:CO2,CO5
Relevant PO's:
1,2,4,5,8,9,11

Course outcomes (Course Skill Set): The student will be able to:

- **Explain** the fundamentals of data communication.
- **Illustrate** the techniques for digital transmission and bandwidth utilization using various transmission media.
- **Analyze** the principles of protocol layering in modern communication systems.
- **Demonstrate** the working of physical and data link layer services using simulation tools.

PO:PO1-Science and Engineering knowledge
PO2-Problem Analysis
PO3-Design & Development
PO4-Investigation of complex problem solving
PO5: Engineering Tool Usage
PO8- Individual and Collaborative Team Work
PO9-Communication
PO11-Lifelong learning

Significance of Results/Outcomes

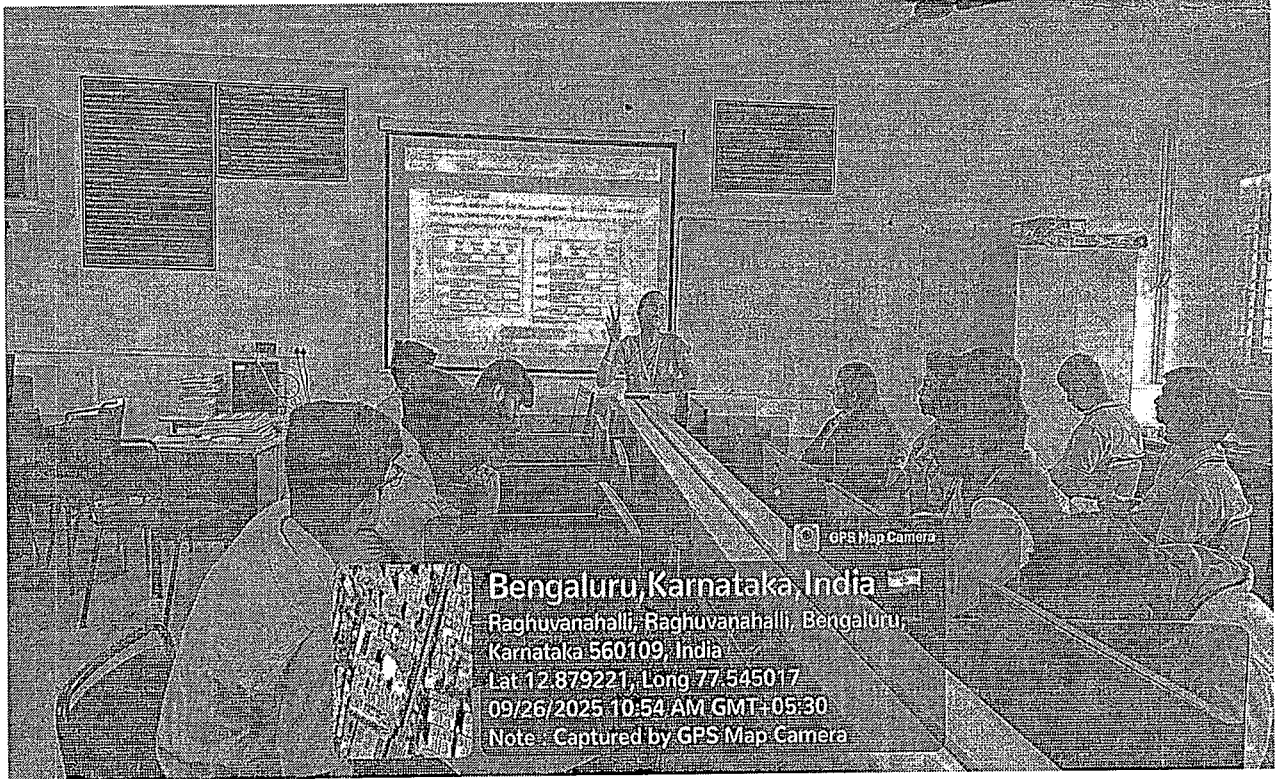
- Students understood the how Data Communication working using Cisco Packet Tracer and real time.
- They can understand the how protocols are working in the internet during the data communication time.

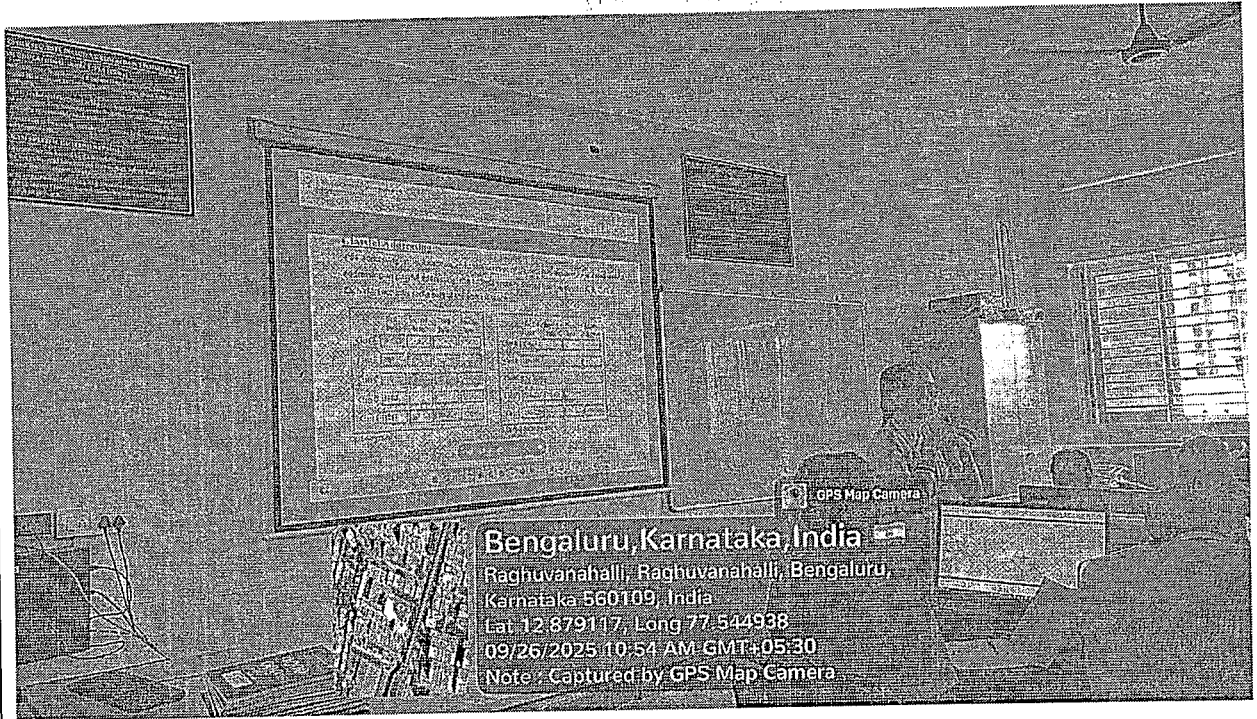
Reflective Critique

This pedagogy encouraged the students to gain knowledge about Protocols and its working in the internet for data communication.

Proofs (Photographs/Videos/Reports/Charts/Models)

Significant photographs are attached with report





A Comprehensive Report on Internet Protocol Version 4 (IPv4), Subnetting, and Subnet Mask

1. Introduction

The Internet is a global network of interconnected computers and devices. For effective communication between these devices, a standardized addressing and routing system is required. The Internet Protocol (IP) is responsible for identifying devices and routing data packets across networks.

Internet Protocol Version 4 (IPv4) is the fourth version of IP and is the most widely used protocol for network communication. To efficiently manage IP addresses, concepts such as subnetting and subnet masks are used.

2. Internet Protocol Version 4 (IPv4)

2.1 Definition

IPv4 is a connectionless network-layer protocol used to identify devices on a network and route data packets from source to destination using logical addresses known as IP addresses.

2.2 IPv4 Address Format

An IPv4 address: Is 32 bits long Written in dotted decimal notation Divided into four octets (8 bits each)

Example:

192.168.1.10

Each octet ranges from 0 to 255.

2.3 Structure of IPv4 Address

An IPv4 address consists of two parts:

Network ID – Identifies the network

Host ID – Identifies the device within the network

| Network Portion | Host Portion |

2.4 Classes of IPv4 Addresses

Class	Range	Default Subnet Mask	Usage
Class A	1.0.0.0 – 126.255.255.255	255.0.0.0	Large networks
Class B	128.0.0.0 – 191.255.255.255	255.255.0.0	Medium networks
Class C	192.0.0.0 – 223.255.255.255	255.255.255.0	Small networks
Class D	224.0.0.0 – 239.255.255.255	N/A	Multicasting
Class E	240.0.0.0 – 255.255.255.255	N/A	Research

2.5 Special IPv4 Addresses

Network Address: First address in a network

Broadcast Address: Last address in a network

Loopback Address: 127.0.0.1

Private IP Addresses:

Class A: 10.0.0.0 – 10.255.255.255

Class B: 172.16.0.0 – 172.31.255.255

Class C: 192.168.0.0 – 192.168.255.255

2.6 Limitations of IPv4

- Limited address space (only ~4.3 billion addresses)
- Security features not built-in
- Requires NAT (Network Address Translation)
- Address exhaustion problem

3. Subnetting

3.1 Definition

Subnetting is the process of dividing a large network into smaller logical networks called subnets. It improves network efficiency, security, and management.

3.2 Need for Subnetting

Efficient use of IP addresses

Reduced network traffic

Improved security

Easier network management

Logical division of departments

3.3 How Subnetting Works

Subnetting borrows bits from the host portion of the IP address to create:

Subnet ID

Smaller host groups

3.4 Advantages of Subnetting

Better bandwidth utilization

Reduced broadcast domains

Improved fault isolation

Scalability

3.5 Disadvantages of Subnetting

Complex configuration

Requires careful planning

Incorrect subnetting may cause connectivity issues

4. Subnet Mask

4.1 Definition

A subnet mask is a 32-bit number used to separate the network portion and host portion of an IPv4 address.

4.2 Format of Subnet Mask

Consists of continuous 1s followed by 0s

1s represent network bits

0s represent host bits

Example: 255.255.255.0

Binary: 11111111.11111111.11111111.00000000

4.3 Default Subnet Masks

Class	Subnet Mask
Class A	255.0.0.0
Class B	255.255.0.0
Class C	255.255.255.0

4.4 CIDR Notation (Beyond Syllabus)

Classless Inter-Domain Routing (CIDR) uses slash notation:

Example: 192.168.1.0/24

/24 indicates number of network bits

Allows flexible subnetting

Reduces IP address wastage

4.5 Subnetting Example

Given: IP Address: 192.168.1.0

Subnet Mask: 255.255.255.192

Number of subnets: 4

Hosts per subnet: 62

Subnet ranges:

192.168.1.0 – 192.168.1.63

192.168.1.64 – 192.168.1.127

192.168.1.128 – 192.168.1.191

192.168.1.192 – 192.168.1.255

5. Relationship Between IPv4, Subnetting, and Subnet Mask

IPv4 provides addressing

Subnetting divides networks

Subnet mask identifies subnet boundaries

All three work together for efficient routing

6. Applications in Real Networks

Corporate networks

Internet Service Providers (ISPs)

Campus networks

Cloud networking

Data centre's

7. Comparison: IPv4 vs IPv6 (Beyond Syllabus)

Feature	IPv4	IPv6
Address length	32-bit	128-bit
Address space	Limited	Very large
Security	Optional	Built-in
Configuration	Manual/DHCP	Auto-configuration

8. Conclusion

IPv4 remains the backbone of modern networking despite its limitations. Subnetting and subnet masks play a crucial role in efficient IP address management and network design. Understanding these concepts is essential for network administrators, engineers, and students of computer networks. Though IPv6 is emerging, IPv4 with subnetting continues to be widely used worldwide.

9. References

Computer Networking – Andrew S. Tanenbaum

TCP/IP Illustrated – W. Richard Stevens

IEEE Networking Standards

Cisco Networking Academy

Sl. No	USN	Students Name	Marks (10)	Marks (10)
1	1KS22CM004	ARPITHA	4	4
2	1KS22CM029	MANUSHREE J	0	0
3	1KS23CM001	AKASH LAXMAN BAJANTRI	9	9
4	1KS23CM003	BHIMASHANKAR	4	7
5	1KS23CM004	BHOOMIKA L M	10	10
6	1KS23CM005	CHANDANA A ATHREYESA	10	10
7	1KS23CM006	CHETAN CHANNAVEER	9	9
8	1KS23CM007	D YASHAS	4	9
9	1KS23CM008	DEEPAK R PISE	10	10
10	1KS23CM009	DHANANJANEYA S S	9	9
11	1KS23CM010	DITENDRASAI G	10	10
12	1KS23CM011	HAMSA S	10	10
13	1KS23CM012	HRISHIKESH Y	8	8
14	1KS23CM013	JAGADESH	9	9
15	1KS23CM014	JNANESHWARI D S	9	9
16	1KS23CM015	K R CHARAN	7	9
17	1KS23CM016	K. SHRIDEVI B ADIGA	10	10
18	1KS23CM017	KHUSHI K	10	10
19	1KS23CM018	KRUTHIKA S R	10	10
20	1KS23CM019	LAVANYA G C	10	10

21	1KS23CM020	LAVANYA SHETTY	10	10
22	1KS23CM021	MAANYA ARUN	10	10
23	1KS23CM022	MADHU MITHA S	10	10
24	1KS23CM023	MAHALAKSHMI N	10	10
25	1KS23CM024	MANASA G K	10	10
26	1KS23CM025	MANYA D	9	9
27	1KS23CM026	MOHAMMAD ATIYAB	9	9
28	1KS23CM027	MOHAN KUMAR K S	10	10
29	1KS23CM028	MOUNISHA H K	4	4
30	1KS23CM029	MRINAL DESHPANDE	10	10
31	1KS23CM030	NAMRATHA BHARGAVA S	5	5
32	1KS23CM031	NIRANJAN P Y	10	10
33	1KS23CM032	NITHINKUMAR T S	9	9
34	1KS23CM033	PALLAVI S	9	9
35	1KS23CM034	PRASHANTH D S	9	9
36	1KS23CM035	PREKSHA G	10	10
37	1KS23CM036	PRIYANKA H RAJ	0	0
38	1KS23CM037	PRUTHVI DEVI V	10	10
39	1KS23CM038	PRUTHVIK M	10	10
40	1KS23CM039	RAKSHA K	10	10
41	1KS23CM040	REETA GRACY	10	10
42	1KS23CM041	S R DARSHAN	10	10
43	1KS23CM042	SAGAR RAJA SUBRAMANYA	10	10
44	1KS23CM043	SHUBAN S	10	10
45	1KS23CM044	SNEHA SHIVANAND HALLIKERI	10	10
46	1KS23CM045	SUBHAM BANERJEE	9	9
47	1KS23CM046	SUJAN S	10	10
48	1KS23CM047	SUJITH S	10	10

49	1KS23CM048	SUKETH S M	10	10
50	1KS23CM049	SUNAAD S BHATT	10	10
51	1KS23CM050	SUPRIYA	10	10
52	1KS23CM051	SYED ISMAIL	10	10
53	1KS23CM052	TEJAS L	10	10
54	1KS23CM053	TEJAS R C	9	9
55	1KS23CM054	THRISHA K S	9	9
56	1KS23CM055	VAISHNAVI S	10	10
57	1KS23CM056	VARSHA RANGANATHA	10	10
58	1KS23CM057	VATHSALA	9	9
59	1KS23CM058	VENKATESH B V	9	9
60	1KS23CM059	VIKAS M	10	10
61	1KS23CM060	VISHNU PRIYA G S	10	10
62	1KS24CM400	BHOOMIKA S	5	6
63	1KS23CM402	SUDHULAKUNTA AJAY KUMAR	10	10

Shree H. C.

Signature of Course In charge

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Signature of HOD

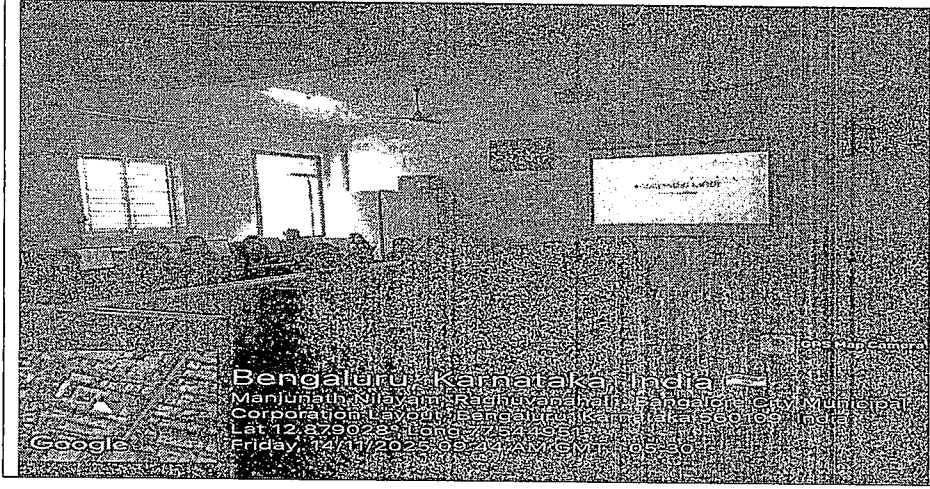
Head of the Department
 Dept. of Computers and Communication Engg.
 K. S. Institute of Technology
 Bengaluru - 560 109.



Academic Year	2025-26 (ODD)
Name of the Faculty	Shruthi P
Course Name /Code	ADVANCED COMPUTER ARCHITECTURE/BCM701
Semester	VII
Activity Name	ONLINE-QUIZ
Topic Covered	Basic addressing modes in Computer organization
Date	14/11/2025
No. of Participants	59
Objectives/Goals	<ul style="list-style-type: none">• To improve basic computer architecture Knowledge• To use modern tool
ICT Used	PPT and Systems
Appropriate Method/Instructional materials/Exam Questions • Lab session	
Relevant PO's	5, 9,10
Significance of Results/Outcomes	• Students were able to know the basic concepts oof computer architecture.
Reflective Critique	• The main goal of this activity was to enable students to study in depth of different addressing modes of computer architecture .

Proofs : Report is attached





Bengaluru, Karnataka, India
Manjunath Nilaya, Rajinivaraha Hall, Bangalore City Municipal Corporation Layout, Bengaluru, Karnataka 560009, India
Lat: 12.879023, Long: 75.1793
Friday, 4/11/2025 05:24 AM GMT+05:30

Signature of Course In charge

Signature of HOD CCE



CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	Ranjana S. Chakrasali
Course Name /Code	Network Management System / BCM702
Semester/Section	VII/ A
Activity Name	Activity on ZenMap Tool
Topic Covered	ZenMap Tool
No. of Participants	59 (group of 3 or 4 was assigned with 5 Problem statements for each batch)
Objectives/Goals	Understand usage of ZenMap tool and learn practical applications of it and henceforth improving their knowledge.
ICT Used	LCD + Systems with ZenMap open-source tool.
Relevant CO's	CO5
Relevant PO's	PO1, PO2, PO3, PO5, PO8, PO9
Significance of Results/Outcomes	Students were able to: Implement Nmap commands for the 5 problem statements given for each group.
Reflective Critique	<ul style="list-style-type: none">• ZenMap tool is graphical interface that helps to understand simplified way of network scanning and analysis.• Students learnt how devices communicate across the network, services are distributed and identify potential vulnerabilities that may exist in the network.
Proofs attached: <ol style="list-style-type: none">1. Report is submitted by each batch2. The activity report consists of the following topics and was submitted by each group.<ol style="list-style-type: none">1. Cover page2. Bonafide certificate3. Table of contents4. Acknowledgement5. Abstract6. Introduction7. Usage of ZenMap Tool8. Implementation of commands with outputs9. Applications of ZenMap10. Advantages and Disadvantages of ZenMap tool11. Conclusion12. References	

R. Chakrasali
Signature of the Course In-charge

R. Chakrasali
27/1/26
Signature of HOD
Head of the Department
Dept. of Computers and Communications Engg.
K. S. Institute of Technology
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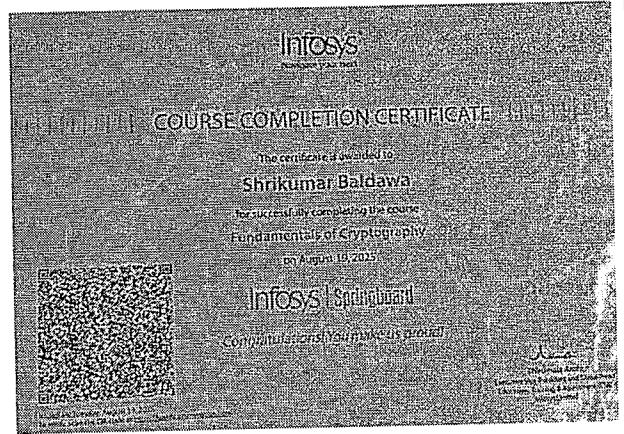
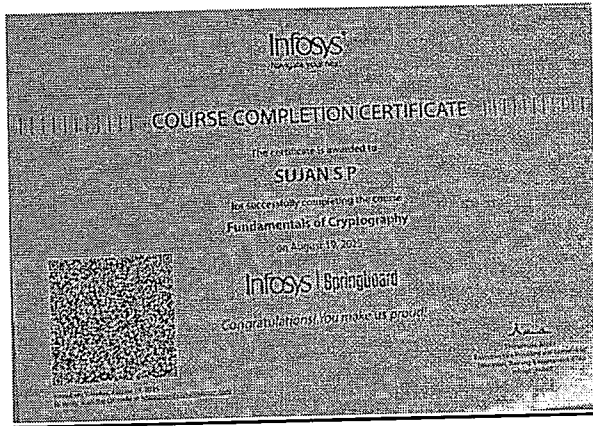
DEPARTMENT OF COMPUTER AND COMMUNICATION
ENGINEERING

TEACHING AND LEARNING

CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	MANGALA S. HIREMATH
Course Name /Code	CRYPTOGRAPHY & NETWORK SECURITY/BCS703
Semester/Section	VII / A
Activity Name	Online Certification – Infosys Springboard
Topic Covered	Fundamentals of Cryptography
No. of Participants	57
Objectives/Goals	To understand the fundamentals of cryptography and also learn about Public Key Infrastructure. This course explains the need and operations of important cryptographic operations
ICT Used	E-Learning
Appropriate Method/Instructional materials/Exam Questions	Infosys Springboard: Fundamentals of Cryptography
Relevant PO's	PO1, PO2, PO5, PO6, PO11
Significance of Results/Outcomes	Students were able to understand the concepts of Cryptography.
Reflective Critique	<input type="checkbox"/> Certification courses help students show and build their expertise in courses selected. <input type="checkbox"/> It aims students to sharpen their skill sets and prepare well for their future career.

Sample Course Completion Certificate



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Bengaluru - 560 109.



CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	D SARITHA
Course Name /Code	Deep Learning (BCS714A)
Semester/Section	VII/ A
Activity Name	Report
Topic Covered	Back Propagation Algorithm
No. of Participants	57
Objectives/Goals	To understand different DL algorithms to improving their knowledge.
ICT Used	PPT
Relevant PO's	PO8, PO9, P10, PO11, PO12
Significance of Results/Outcomes	Students were able to Understand DL Algorithms.

Proofs attached:

Backpropagation Algorithm

Neural Networks – Machine Learning

Introduction

- Backpropagation is a learning algorithm for neural networks
- Used to minimize error in predictions
- Works with supervised learning
- Based on gradient descent method

Why Backpropagation?

- Trains multi-layer neural networks
- Adjusts weights automatically
- Improves accuracy of the model
- Efficient and widely used

Basic Idea

- Forward pass: calculate output
- Compute error at output layer
- Backward pass: propagate error backward
- Update weights to reduce error

Steps of Backpropagation

- Initialize weights randomly
- Perform forward propagation
- Calculate loss (error)
- Compute gradients
- Update weights
- Repeat until convergence



Signature of the Course In-charge

For Shreele H. C.

Signature of HOD
Head of the Department
Dept. of Computers and Communication Engg.
K. S. Institute of Technology
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DEPARTMENT OF COMPUTER AND COMMUNICATIONS ENGINEERING

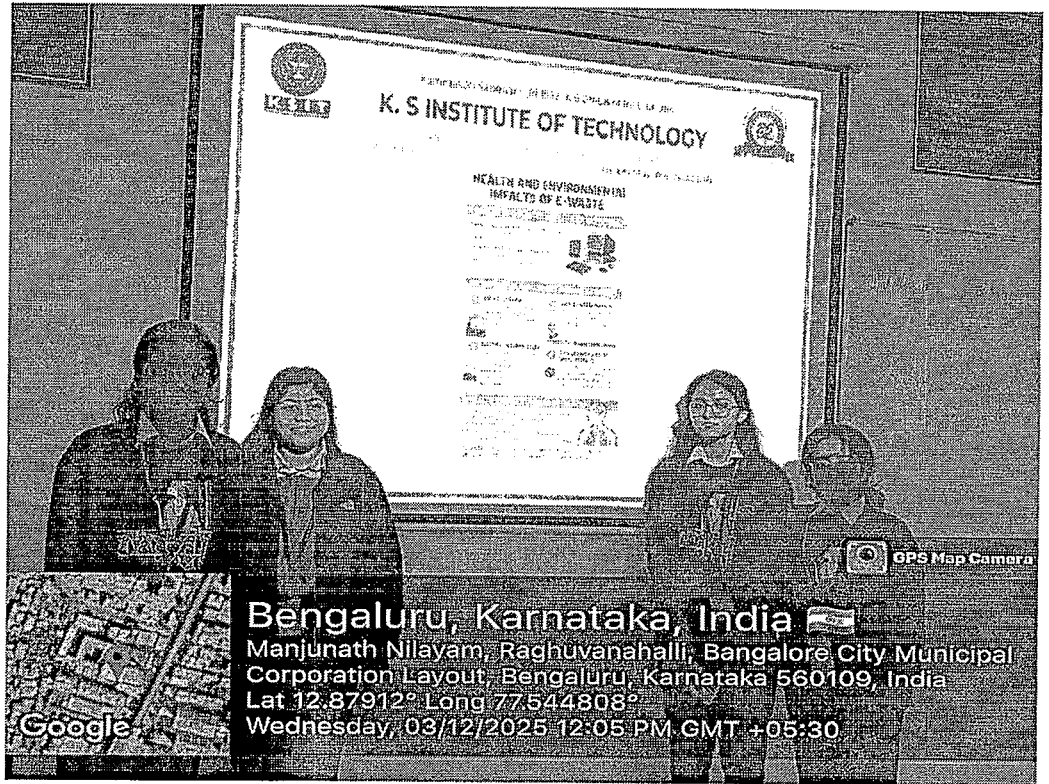
TEACHING AND LEARNING

CONTENT BEYOND SYLLABUS

Academic Year	2025-26 (ODD)
Name of the Faculty	Shilpa M.
Course Name /Code	E-Waste Management /BEC755A
Semester/Section	VII/ A
Activity Name	Poster presentation on different topics
Topic Covered	<ul style="list-style-type: none">• E- waste management in China, EU countries, Russia• Initiatives / Ideas in Formalising the informal sectors of E-waste management in India• E-waste management - Recycling methodology used in different countries - A comparative study• Informal vs. Formal E-waste Recycling Systems• Green Electronics & Eco-Design for Sustainability• Role of Consumers in Responsible E-waste Disposal• Future of E-waste Management – Towards Zero Waste Electronics• Best Practices & Success Stories in E-waste Management (India & Global)• Health and Environmental Impacts of E-waste (Include case studies and research reports)• E-waste management in India - A comprehensive Mindmap• Creative initiatives in managing e waste.• Packaging and labeling of E-waste - Guidelines.• ROHS compliance requirements in India
No. of Participants	57
Objectives/Goals	<ul style="list-style-type: none">• To create awareness about the growing problem of E-waste and its impact on human health and the environment.• To understand global E-waste management practices by studying systems adopted in countries like China, EU nations, and Russia.• To analyze the current E-waste management scenario in India, including policies, challenges, and

	<p>implementation gaps.</p> <ul style="list-style-type: none"> ● To compare formal and informal E-waste recycling systems and evaluate their advantages, limitations, and social implications. ● To study different E-waste recycling technologies and methodologies used across countries. ● To highlight the importance of consumer responsibility in safe disposal, recycling, and reduction of electronic waste. ● To explore sustainable solutions such as green electronics, eco-design, and zero-waste electronics concepts. ● To examine health and environmental risks associated with improper E-waste handling using case studies and research findings.
ICT Used	BB+LCD
Appropriate Method/Instructional materials/Exam Questions	
<ol style="list-style-type: none"> 1. The poster was designed and the presentation was done by students using powerpoint slides. 2. A hard copy of the poster was submitted and is attached a proof with the report. 	
Exam Questions	
Relevant CO's	CO1, CO2,CO3, CO4, CO5
Relevant PO's	
Significance of Results/Outcomes	<p>Students were able to Identify the importance of proper management of E-waste, eco-friendly design of E-products, sustainable recycling technologies used to manage and recover valuable materials from E-waste, the approach taken by different countries in managing E-waste and Initiatives that can be taken by our country to formalise E-waste management sectors.</p>
Reflective Critique	<ul style="list-style-type: none"> ● The poster presentation helped students to analyze the current scenario in India in E-Waste management. ● Students were able to creatively express their learning through posters. ● Students worked in groups to create the poster thereby fostering their communication skills and project management skills.

**Proofs attached:
Photos of the Presentation**



• Value of property...
 • Public...
 • Distance...

Japan
 • Home...
 • Home...
 • Consumer...
 • Consumer...

presented by...



Bengaluru, Karnataka, India

Mal...
 ...
 ...
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 ...

GPS Map Camera

Google

Wednesday, 03/12/2025 12:26 PM GMT +05:30

Posters



Kammavari Sangham (R) 1952, K. S. Group of Institutions
K. S. INSTITUTE OF TECHNOLOGY

Raghuvanahalli, Kanakapura Road, Bengaluru-560109,

Affiliated to VTU, Belagavi

& Approved by AICTE, New Delhi, Accredited by
NAAC



E-WASTE RECYCLING IN INDIA

INFORMAL vs FORMAL: A Choice for a Greener Future

INFORMAL SYSTEM



Method:

- Manual Dismantling, Open Burning, Acid Leaching

Workers:

- Mostly Unskilled, No Safety Gear, Child Labour

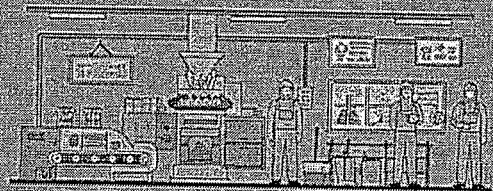
Environment

- Serious Diseases, Respiratory Issues, Toxin Release, Neurological Damage

Health Impact

- Untaxed, Exploitive, No Social Security

FORMAL SYSTEM



Method:

- Automated Shredding, PPE Provided, Trained Professionals, Safer Chemicals

Workers

- Safe Working Conditions, Regular Leaching, Refurbishment

Health Impact

- Controlled Emissions, Waste Treatment, Resource Collar Economy

Economic

- Taxed, Regulated, Social Security Benefits

**SUPPORT REGISTERED RECYCLERS.
CHOOSE RESPONSIBLE E-WASTE DISPOSAL**



Problem Statement

- Rapid increase in discarded electronics worldwide.
- India generates 2 million tons of e-waste yearly.
- Only 20-30% is recycled properly.
- Toxic materials pollute soil, air, and water.

Key Statistics

- Global e-waste: 62 million tons (2024).
- India is the 3rd largest e-waste generator.
- Only 17% of plastic e-waste is formally recycled.
- 1 smartphone contains 60 valuable metals.

CURRENT CHALLENGES

- SHORTER ELECTRONIC LIFE CYCLES.
- LOW CONSUMER AWARENESS ABOUT SAFE DISPOSAL.
- DOMINANCE OF INFORMAL RECYCLING SECTOR.
- LIMITED AUTHORIZED RECYCLING FACILITIES.
- MIXED WASTE MAKES SEGREGATION DIFFICULT.

HEALTH IMPACTS OF E-WASTE EXPOSURE

- LEAD HARMS THE BRAIN AND NERVOUS SYSTEM.
- MERCURY CAUSES KIDNEY AND NEUROLOGICAL DAMAGE.
- CADMIUM LEADS TO LUNG AND BONE PROBLEMS.
- TOXIC FUMES → RESPIRATORY ISSUES, ASTHMA, CANCER.
- WORKERS' FACE SKIN, EYE, AND HEADACHE ISSUES.
- LONG-TERM EXPOSURE → DNA DAMAGE AND WEAK IMMUNITY.

ENVIRONMENTAL IMPACTS

- SOIL CONTAMINATION FROM HEAVY METALS.
- GROUNDWATER POLLUTION FROM CHEMICAL LEACHING.
- AIR POLLUTION FROM OPEN BURNING OF WIRE AND PLASTICS.
- MICROPLASTICS RELEASED FROM SHREDDED ELECTRONICS.
- LOSS OF BIODIVERSITY NEAR DUMPING AREAS.

WHY ZERO-WASTE ELECTRONICS MATTER

- REDUCES ENVIRONMENTAL POLLUTION.
- PROTECTS HUMAN HEALTH FROM TOXIC CHEMICALS.
- SAVES VALUABLE METALS AND RESOURCES.
- LOWERS CARBON FOOTPRINT.
- SUPPORTS SUSTAINABLE DEVELOPMENT GOALS.



TOWARDS ZERO-WASTE ELECTRONICS

- PROMOTE REUSE, REPAIR, RECYCLING.
- USE MODULAR AND UPGRADEABLE DEVICES.
- ADOPT CLOSED-LOOP MANUFACTURING.
- RECOVER METALS THROUGH URBAN MINING.
- REDUCE TOXIC MATERIALS IN PRODUCTION.

GOVERNMENT INITIATIVES (INDIA)

- E-WASTE MANAGEMENT RULES, 2016 & 2022.
- PRODUCERS MUST COLLECT AND RECYCLE E-WASTE (EPR - EXTENDED PRODUCER RESPONSIBILITY).
- COMPANIES MUST TAKE BACK OLD PRODUCTS.
- AUTHORIZED RECYCLING CENTERS CERTIFIED BY CPCB.
- AWARENESS CAMPAIGNS FOR SAFE DISPOSAL.

WHAT CONSUMERS CAN DO

- DONATE OR REPAIR INSTEAD OF THROWING AWAY.
- DISPOSE AT AUTHORIZED E-WASTE COLLECTION CENTERS.
- AVOID BURNING OR DUMPING ELECTRONICS.
- CHECK FOR E-WASTE BINS IN MALLS, OFFICES, TECH STORES.
- PREFER REPAIRABLE, MODULAR, OR REFURBISHED DEVICES.

COMPOSITION OF E-WASTE

- PRECIOUS METALS: GOLD, SILVER, PALLADIUM.
- BASE METALS: COPPER, ALUMINUM, IRON.
- RARE EARTH ELEMENTS: NEODYMIUM, YTITRIUM.
- PLASTICS: ABS, PVC, POLYCARBONATE.
- HAZARDOUS MATERIALS: LEAD, MERCURY, CADMIUM.
- GLASS: FIBERGLASS, BATTERIES.

FUTURE TECHNOLOGIES IN E-WASTE MANAGEMENT

- AI-POWERED SORTING AND AUTOMATED RECYCLING ROBOTS.
- BIO-LEACHING TO EXTRACT METALS USING BACTERIA.
- HYDROMETALLURGY FOR RECOVERY OF GOLD & COPPER.
- MODULAR AND REPAIRABLE DEVICE DESIGN.
- IoT-ENABLED TRACKING OF ELECTRONIC PRODUCTS.
- BIODEGRADABLE ELECTRONIC MATERIALS.

Prepared By: Anush K (18122CA0041)
 Arun U (18122CA0041)
 Hemant K E (18122CA0022)
 Suleen S P (18122CA0054)

Shilpa M
 Signature of Course-Incharge

[Signature]
 Signature of HOD, CCE
 Head of the Department
 Dept. of Computers and Communication Engg.
 K. S. Institute of Technology
 Bengaluru - 560 109.